



**NATIONAL  
CONSERVATION  
LANDS**

# Grand Staircase-Escalante National Monument

## PROPOSED RESOURCE MANAGEMENT PLAN AND FINAL ENVIRONMENTAL IMPACT STATEMENT

VOLUME 1: DEAR READER LETTER, ABSTRACT, EXECUTIVE SUMMARY, TABLE  
OF CONTENTS, CHAPTERS 1–4, REFERENCES, GLOSSARY, INDEX

August 2024



---

U.S. DEPARTMENT OF THE INTERIOR

## **BUREAU OF LAND MANAGEMENT**

### **Our Mission**

The Bureau of Land Management's mission is to sustain the health, diversity, and productivity of public lands for the use and enjoyment of present and future generations.

## **NATIONAL CONSERVATION LANDS**

### **Mission**

Conserve, protect, and restore nationally significant landscapes that have outstanding cultural, ecological, and scientific values for the benefit of current and future generations.

Photo by VISIO Photography (James and Jenny Tarpley),  
2015 and 2016 GSENM Artists in Residence,  
Grand Staircase-Escalante National Monument

---



# United States Department of the Interior



BUREAU OF LAND MANAGEMENT  
Paria River District  
Grand Staircase-Escalante National Monument  
669 S. Highway 89A  
Kanab, UT 84741

August 23, 2024

In Reply Refer To:  
1610/6240 (UT-P01)

Dear Reader:

Enclosed is the Grand Staircase-Escalante National Monument (GSENM) Proposed Resource Management Plan (RMP) and associated Final Environmental Impact Statement (EIS). The Bureau of Land Management (BLM), Paria River District Office, prepared the Proposed RMP/Final EIS in response to Presidential Proclamation 10286, which restored the boundaries and management direction for GSENM that existed prior to December 4, 2017, and mandated that the BLM prepare and maintain a new management plan for the BLM-managed lands within the entirety of the restored monument boundaries. The BLM developed the Proposed RMP/Final EIS in accordance with applicable laws, including, but not limited to, the National Environmental Policy Act of 1969 (42 United States Code 4321 et seq.), the Federal Land Policy and Management Act of 1976 (43 United States Code 1712 et seq.), and the BLM's resource management planning regulations in 43 Code of Federal Regulations 1610.

The purpose of the Proposed RMP/Final EIS is to provide a management framework, including goals, objectives, and management direction, to guide GSENM resource management consistent with the protection of GSENM objects and other direction in the Proclamation 10286. The approved RMP would replace the existing RMPs for GSENM and the Kanab-Escalante Planning Area that were approved in February 2020.

In developing the Proposed RMP/Final EIS, the BLM considered (1) applicable planning criteria, (2) information and issues provided by agency resource specialists, (3) input from consultation with Tribal Nations and coordination with cooperating agencies, and (4) information and issues raised through scoping and the public review period. This process resulted in the development of five alternatives, including the No Action Alternative, which represents the continuation of current management as consistent with Proclamation 10286. These alternatives are described in Chapter 2 of the Proposed RMP/Final EIS. Chapter 3 presents the affected environment and analyses of the potential impacts on resources and resource uses from implementation of the alternatives. Chapter 4 describes the BLM's consultation and coordination efforts throughout the process. Appendixes are used to provide supporting information for Chapters 2, 3, and 4.

The primary changes from the Draft RMP/EIS to the Proposed RMP/Final EIS include the analysis of Alternative E; the use of updated assessment, inventory, and monitoring data to revise the list of departed watersheds; supplemental areas of critical environmental concern and research natural area nominations and evaluations; the inclusion of the public comment process,

summary, and responses; the development of a monitoring plan; the inclusion of a final air quality emissions inventory; the completion and inclusion of the Old Spanish National Historic Trail Corridor Assessment and Inventory Report and associated management direction and analysis; and the review of applicable State and local land use plans for plan consistency.

A summary of comments and the BLM's responses to the comments received during the 90-day public review period of the Draft RMP/EIS, proposed recreational shooting closures, and proposed areas of critical environmental concern can be found in Appendix J of the Proposed RMP/Final EIS.

Release of the Proposed RMP/Final EIS initiates a 30-day protest period for any person who previously participated in the planning process and has an interest that is (or may be) adversely affected by the Proposed RMP. The protest regulations specify the required elements for filing a valid protest. To help guide you through this process, there is a critical item checklist available at <https://www.blm.gov/programs/planning-and-nepa/public-participation/filing-a-plan-protest>. As much as possible, cite specific planning documents or available planning records (such as summaries, correspondence, etc.) in your protest.

All protests must be in writing and filed with the BLM Director, either as a hard copy or electronically via the BLM's ePlanning website, by the close of the protest period. The only electronic protests the BLM will accept are those filed through the ePlanning website at <https://eplanning.blm.gov/eplanning-ui/project/2020343/510>. All protest letters sent to the BLM via fax or email will be considered invalid unless a properly filed protest is also submitted.

If you do not have the ability to file your protest electronically, hard-copy protests must be mailed to the following address (regular and overnight mail), postmarked by the close of the protest period:

BLM Director  
Attention: Protest Coordinator (HQ210)  
Denver Federal Center, Building 40 (Door W-4)  
Lakewood, CO 80215

Before including your address, phone number, email address, or other personal, identifying information in your protest, be advised that your entire protest—including your personal, identifying information—may be made publicly available at any time. While you can ask the BLM in your protest to withhold from public review your personal, identifying information, the BLM cannot guarantee that it will be able to do so.

The BLM Director will make every attempt to promptly render a decision on each protest. The decision will be in writing and will be sent to the protesting party by certified mail, return receipt requested. The BLM Director's decision shall be the final decision of the Department of the Interior on each protest. Responses to protest issues will be compiled and formalized in a Director's Protest Resolution Report made available following issuance of the decisions. Upon resolution of all land use plan protests, the BLM will issue an Approved RMP and Record of Decision. The Approved RMP and Record of Decision will be made available electronically to

all who participated in the planning process and will be available on the BLM's ePlanning website at <https://eplanning.blm.gov/eplanning-ui/project/2020343/510>.

I thank the individuals and organizations who participated in the planning process. Your interest is appreciated. I hope your interest and involvement will continue as we move forward with the plan in GSENM.

Sincerely,

HARRY BARBER Digitally signed by HARRY  
BARBER  
Date: 2024.08.13 10:01:18  
-06'00'

Harry A. Barber  
Paria River District Manager  
Bureau of Land Management

This page intentionally left blank.

## Grand Staircase-Escalante National Monument **Proposed** Resource Management Plan and **Final Environmental Impact Statement (GSENM Proposed RMP/Final EIS)**

1. Responsible Agency: United States Department of the Interior  
Bureau of Land Management
2. Type of Action: Administrative (X) Legislative ( )
3. Document Status: Draft ( ) Final (X)
4. Abstract: The Grand Staircase-Escalante National Monument (GSENM) **Proposed** Resource Management Plan (RMP) and associated **Final** Environmental Impact Statement (EIS) describe and analyze alternatives for the planning and management of public lands and resources administered by the Bureau of Land Management (BLM), Paria River District Office. The planning area is in Kane and Garfield Counties in **southern** Utah. Within the planning area, the BLM **manages** approximately 1,865,600 acres of surface land, referred to as the decision area. The decision area does not include state, municipal, or private land.

Proclamation 10286, which restored the boundaries and management conditions of GSENM **that existed prior to December 4, 2017**, directs the BLM to “prepare and maintain a new management plan for the entire monument” for the specific purposes of “protecting and restoring the objects identified [in Proclamation 10286] and in Proclamation 6920.” The RMP’s **purpose** (40 **Code of Federal Regulations** 1502.13) is to provide a management framework, including goals, objectives, and management direction, to guide GSENM **resource** management consistent with the protection and restoration of GSENM objects and the management direction provided in Proclamations 10286 and 6920.

The GSENM RMP must reflect the unique issues, management concerns, and resource conditions of the **planning** area while reflecting the purposes set forth in Proclamation 10286. As part of the RMP revision process, the BLM conducted scoping to solicit input from the public and interested agencies on the nature and extent of issues and impacts to be addressed in the **Proposed RMP/Final EIS**. Planning issues identified for this RMP revision focus on climate change, ecosystem resiliency, wildland fire and fuels management, promoting **the** recovery of special status species, management **of wilderness study areas and lands with wilderness characteristics**, livestock grazing, land tenure patterns and **an** access strategy, broad recreational uses and **a** response to **an** increasing population, and changing land uses.

**Alternative A** is the No Action Alternative that continues current management from the 2020 Approved RMPs for the GSENM and Kanab-Escalante Planning Area. Under this alternative, the BLM would continue to manage the use of public lands and resources under the existing RMPs, as amended, to the extent they are consistent with Proclamation 10286. In some cases, decisions in the 2020 Approved RMPs are inconsistent with Proclamation 10286; in those instances, **Alternative A** has been modified to be consistent with Proclamation 10286. **Alternative B** emphasizes flexibility in planning-level direction to maximize the potential for an array of discretionary actions that may be compatible with the protection of GSENM objects.

**Alternative C** underlines the protection and maintenance of intact and resilient landscapes using an area management approach to selectively allow for discretionary uses in appropriate settings. **The BLM would establish** four management areas **that are** similar to those used in the 2000 Monument

Management Plan: the front country area, passage area, outback area, and primitive area. **Alternative D** strives to maximize natural ecological processes by minimizing active management and limiting discretionary uses. Land use allocations would curtail discretionary uses, including recreation, livestock grazing, rights-of-way, and activities under special recreation permits.

The BLM developed a Proposed RMP, **Alternative E**, to be evaluated in this Final EIS using Alternative C as its basis and revising it based on the consideration of public comments, cooperating agency and government-to-government consultation, and updates to the best available science and information, and by combining elements of the alternatives analyzed in the Draft RMP/EIS. **Alternative E**, the Proposed RMP, is within the range of alternatives considered in the Draft RMP/EIS. **Alternative E** also carries forward the four management areas that are similar to those used in the 2000 Monument Management Plan: the front country area, passage area, outback area, and primitive area. Under **Alternative E**, the designation of management areas would serve primarily as a tool for managing visitation and allowable uses while also protecting GSENM objects.

Alternatives B, C, D, and E provide a range of management strategies for addressing issues identified through internal assessment and public scoping. Comments submitted by other government agencies, public organizations, state and tribal entities, and interested individuals were given careful consideration.

Review period: The review period for the GSENM Proposed RMP/Final EIS will include a 30-day protest period and a 60-day governor's consistency review. These began when the Environmental Protection Agency published a Notice of Availability in the *Federal Register*.

5. For further information, contact the following:

Scott Whitesides, Project Manager  
BLM Utah State Office  
440 West 200 S., Suite 500  
Salt Lake City, UT 84101  
801-598-4054

Adé Nelson, Monument Manager  
Paria River District Office  
669 US-89A  
Kanab, UT 84741  
801-539-405

Email: [GSENM-RMP@empci.com](mailto:GSENM-RMP@empci.com)

Website: <https://eplanning.blm.gov/eplanning-ui/project/94706/510>



# Executive Summary

## ES.1 INTRODUCTION

The Grand Staircase-Escalante National Monument (GSENM) [Proposed](#) Resource Management Plan (RMP) and [Final](#) Environmental Impact Statement (EIS) describes and analyzes a range of alternatives for managing public lands within [the](#) GSENM planning area. The planning area is in Kane and Garfield Counties in Utah. Within the planning area, the United States (U.S.) Department of the Interior, Bureau of Land Management (BLM) administers approximately 1,865,600 acres of surface land, referred to as the decision area. The decision area does not include state, municipal, or private land.

On October 8, 2021, Presidential Proclamation 10286 restored the boundaries and management conditions of GSENM to those that [existed](#) prior to Presidential Proclamation 9682, which reduced the size of GSENM and divided it into three units. The purpose of Proclamation 10286 is to “ensure that [this](#) exceptional and inimitable landscape filled with an unparalleled diversity of resources will be properly protected and will continue to provide the living laboratory that has produced so many dramatic discoveries in the first quarter century of its existence.”

## ES.2 PURPOSE OF AND NEED FOR ACTION

Proclamation 10286 directs the BLM to “prepare and maintain a new management plan for the entire monument” for the specific purposes of “protecting and restoring the objects identified [in Proclamation 10286] and in Proclamation 6920.”

The RMP’s underlying purpose (40 Code of Federal Regulations [CFR] 1502.13) is to provide a management framework, including goals, objectives, and management direction, to guide GSENM management consistent with the protection and/or restoration of GSENM objects.

[The following purposes are derived from Proclamations 10286 and 6920, or have been identified by the BLM based on key GSENM management challenges.](#)

- **Protect GSENM’s large, remote, rugged, and markedly impenetrable landscapes.** [The GSENM includes extraordinary dark night skies, natural soundscapes, and a rich mosaic of resources including numerous objects of historic, and scientific interest. The extensive area of unspoiled natural, roadless areas within the GSENM is unique in the lower 48 states, and was part of the impetus for the establishment of the monument in 1996.](#)

[The primary purpose of the plan is to protect GSENM objects including this area’s value as a unique, unspoiled, and natural landscape and its use as an outdoor science laboratory. GSENM’s immense scale and unspoiled naturalness serve as a foundation and provide the context for the monument objects and other important resources within the boundary, including but not limited to the diversity of ecotypes; geological, cultural, and paleontological resources; vegetation; and wildlife.](#)

Management will address anthropogenic—i.e., human-caused—impacts and challenges. Increases in anthropogenic factors pose diverse challenges for resource preservation (for example, adverse vegetation and soil impacts, loss of geologic and cultural resources, the loss of the potential for human solitude,

adverse effects on certain wildlife species, and increases in noise). Incremental and gradual degradation of resources over time, due to ongoing uses, can easily occur unnoticed.

- **Emphasize GSENM as a living, outdoor laboratory.** GSENM focuses on science and provides for diverse and significant research and discovery related to varied resources and objects. Proclamation 6920, which originally designated GSENM in 1996, states, “[e]ven today, this unspoiled natural area remains a frontier, a quality that greatly enhances the monument’s value for scientific study.” Science is the foundational purpose of GSENM.

Through scientifically informed management, GSENM will sustainably provide for scientific pursuits. Given the intensification of human-caused changes in the world, undisturbed and unaltered natural landscapes on the geographic scale of GSENM are increasingly essential, rare, and hard to maintain. Accordingly, GSENM is equally important both for scientific understanding of the past and for understanding changes and trends that allow us to appropriately plan for and understand the future.

- **Protect and/or restore GSENM’s biological resources.** GSENM supports a range of ecotypes, as well as reference populations, across the landscape’s substantial range of elevation and large geographic extent. Due to the remoteness and substantial variation in elevation and topography, GSENM contains five life zones, a variety of habitats, multiple ecoregions, unique and isolated plant communities, and a diversity of invertebrates, birds, reptiles, and mammals.

The BLM will manage species within interconnected communities and ecosystems. Climate change and drought are pushing ecological conditions outside the historical range of variability, affecting the function and resilience of vegetation and, in turn, habitats and species. Accordingly, ecotypes, vegetation communities, and habitats will be managed for resilience.

- **Protect GSENM’s cultural resources.** GSENM provides for scientific, tribal, and public uses of cultural resources. Cultural resources are locations of human activity, occupation, or use that contain materials, structures, or landscapes that were used, built, or modified by people. Cultural resources include archaeological sites, buildings, structures, objects, districts, and locations associated with cultural practices or beliefs of contemporary communities, including Tribal Nations.

Discretionary uses, including livestock grazing and rising visitation levels, pose challenges for archaeological, and historic resource protection, and for tribal access and uses (for example, Tribal Nations with ties to GSENM have appropriate access to traditionally sacred places and landscapes). Management will provide for varied access and uses, while protecting cultural and historic resources.

- **Protect GSENM’s geology, paleontology, and scenic landscapes.** GSENM landscapes contain unique geological resources, world-class paleontological resources, and extraordinary scenery. Scenic exploration can be accessed via paved and unpaved roads that serve as arteries through GSENM.

Geological and paleontological resources will be protected; they also will be appropriately available for scientific use and public enjoyment. Scientific uses require access and resource protection.

- **Protect and/or restore opportunities to experience GSENM's remote landscape and associated adventure and self-discovery.** While not identified as an object in need of protection, Proclamation 10286 acknowledges world-class recreational opportunities in GSENM. Most visitation to GSENM is recreational, and high and increasing levels of recreational visitation are a top management challenge. Large numbers of visitors can both degrade the visitor experience and impede protection of GSENM objects, including ecologically sensitive areas and species.

The BLM will sustainably protect and/or restore GSENM's objects and remote, fragile landscape amid rapidly rising visitation levels. The BLM also will provide diverse recreational opportunities and basic facilities.

- **Manage discretionary uses in GSENM in the context of protecting, maintaining, or restoring GSENM objects.** GSENM lands have long served a variety of uses and purposes for Tribal Nations, European settlers, and the descendants of both. Since the designation of GSENM in 1996, there has been controversy regarding the BLM's discretionary uses within the context of GSENM preservation mandates.

Discretionary uses will be compatible with sustainable protection and/or restoration of GSENM's objects.

### **ES.3 PLANNING ISSUES**

Relevant issues discussed in this EIS are as follows:

- How would proposed management actions and land use allocations contribute to air pollutant emissions and affect air quality and visibility?
- What would be the expected contribution to greenhouse gas (GHG) emissions from proposed management?
- How would proposed management affect long-term carbon storage and sequestration in GSENM?
- How would proposed management affect biological soil crusts?
- How would proposed management affect vulnerable soils?
- How would proposed management affect soil health and ecological function?
- How would existing and proposed land use allocations and discretionary uses affect terrestrial vegetation, including special status plant species?
- How would vegetation management and restoration approaches affect landscape-scale ecological functioning, terrestrial vegetation, and special status plant species?
- How would management decisions of activities that disturb soils and accelerate erosion affect water resources (groundwater, surface water, wetlands, riparian areas, floodplains, and water quality)?
- How would proposed management impact water quality (and water quality standards set by the State of Utah and the U.S. Environmental Protection Agency) and protection of dependent resources? How would proposed vegetation management and land use allocations affect noxious and invasive, nonnative plants?

- How would proposed management impact historic properties?
- How would proposed management protect cultural resources, including cultural landscapes, traditional uses, and historic properties?
- How would proposed management ensure continued traditional uses of religious or cultural sites important to Tribal Nations and local communities?
- How would proposed management impact landscapes of religious or cultural importance to Tribal Nations and local communities?
- How would proposed management decisions regarding paleontological resource management (such as curation, protection, survey, collection, outreach, and interpretation) impact paleontological resources, research communities, local communities, and visitor experiences?
- How would land use allocations and discretionary uses impact paleontological resources?
- How would land use allocations and discretionary uses impact unique geological features?
- How would proposed management affect wildlife, fisheries, and special status species resources?
- How would proposed management affect inventoried visual values, including scenic quality and the public's highly valued experience of enjoying scenery?
- How would proposed management actions affect dark night skies?
- How would proposed management affect natural quiet soundscapes?
- How would land use allocations and discretionary uses affect fire and fuels?
- How would vegetation management actions affect fire and fuels?
- How would proposed management affect the size, apparent naturalness; outstanding opportunities for solitude or primitive, unconfined recreation; and supplemental values of lands with wilderness characteristics?
- How would proposed management impact livestock grazing and ranching operations under existing permits and leases?
- How would proposed management affect rangeland condition?
- How would proposed management affect the BLM's ability to provide recreational opportunities and infrastructure while protecting GSENM objects?
- How would proposed management affect the travel and transportation system in GSENM?
- How would proposed management affect land use authorizations and land tenure in the decision area?
- How would management affect the relevant and important values of potential areas of critical environmental concern (ACECs)?
- How would management affect the nature and purpose of the Old Spanish National Historic Trail?
- How would management impact the viewshed surrounding scenic routes and the experience of enjoying scenic routes within the planning area?
- How would management impact the cultural, historic, and natural resources for which National Heritage Areas were designated?
- How would management affect the free-flowing condition, water quality, outstandingly remarkable values (ORVs), and tentative classification of river segments found suitable for inclusion in the National Wild and Scenic Rivers System?
- How would management affect the wilderness characteristics of wilderness study areas (WSAs)?

- How would BLM management actions impact local and regional economic interests and conditions?
- How would BLM management actions impact social conditions and values of communities?
- How would BLM management actions impact the environment, health, and livelihoods of communities with environmental justice concerns?

## ES.4 ALTERNATIVES

### ES.4.1 Alternative A

Alternative A, which represents the no action alternative, includes the current management from the 2020 GSENM Approved RMPs, and the 2020 Kanab-Escalante Planning Area (KEPA) Approved RMP, to the extent that those management actions are consistent with Proclamation 10286. In some cases, decisions in the 2020 Approved RMPs are inconsistent with Proclamation 10286; in those instances, Alternative A has been modified to comply with Proclamation 10286. As the no action alternative, Alternative A serves as the baseline comparison against which all the action alternatives (B, C, D, and E) are compared.

Alternative A generally allows for more discretionary uses (for example, rights-of-way [ROWs] and livestock grazing) and emphasizes management flexibility while still providing for resource protection as required by applicable regulations, laws, policies, plans, and guidance, including the proper care and management of GSENM objects. Alternative A includes the following:

- Recreation Management Areas (RMAs): There are five special recreation management areas (SRMAs), two extensive recreation management areas (ERMAs), and 10 recreation management zones (RMZs). These RMAs would cover the entirety of GSENM.
- Off-Highway Vehicle (OHV) Use: OHV use would be limited to designated routes, except in No Mans Mesa Research Natural Area (RNA) (ACEC), which would be closed to OHV use, and the Little Desert RMZ in the former KEPA, which would be open to cross-country OHV use.
- Recreational shooting: Recreational shooting would be prohibited within 0.25 miles of residences, campgrounds, and developed recreational facilities. The distance may be increased depending on area-specific conditions.
- Recreational Facilities: The 2020 Approved RMPs do not expressly discuss recreational facilities. However, there are few expressed restrictions outside WSAs on where development could occur.
- Livestock Grazing: Nearly all allotments are available for livestock grazing. All suspended animal unit months (AUMs) could be activated over time, pending subsequent analysis and decisions. The 2020 Approved RMPs allow the creation of new nonstructural range improvements where they are not otherwise restricted by another designation. Existing seedings would be restored using a mix of native and nonnative species.
- ACECs and RNAs (ACECs): Under this alternative, management of the previously designated No Mans Mesa RNA (ACEC) would continue. No new ACECs would be designated.
- Vegetation Management: The BLM could use the full range of vegetation management methods and tools (such as prescribed fire; mechanical, chemical, and biological treatments). Treatments would be prioritized in areas where it would improve rangeland health, wildlife habitat, and forage. Nonnative species would be allowed, where necessary, to optimize land health, forage, and productivity in nonstructural range improvements.

- **Other Discretionary Actions:** Besides WSAs, which are exclusion areas, all lands would be either avoidance areas or open for ROWs, permits, and leases, as allowed by Proclamation 10286. The suitability for these land and realty actions would be assessed on a case-by-case basis. Alternative A also would prohibit the casual collection of all paleontological resources, mineral resources, and petrified wood to the extent that prohibition does not constitute a substantial burden on the exercise of religion under the Religious Freedom Restoration Act and other applicable laws.
- **Lands with Wilderness Characteristics:** Lands with wilderness characteristics would not receive any special management to protect size, naturalness, and opportunities for solitude, or primitive and unconfined types of recreation.
- **Transportation and Access:** Maintenance will be performed in accordance with the 2000 GSENM Management Plan until new travel management plans are completed.

#### ES.4.2 Alternative B

Alternative B emphasizes flexibility in planning-level direction to maximize the potential for an array of discretionary actions that may be compatible with the protection of GSENM objects. Alternative B includes the following:

- **RMA:** Six SRMAs and three RMZs would be established to provide for specific outcomes-based recreational experiences as identified in recreation setting characteristics. Those desired recreation setting characteristics help produce the recreation activity which, in turn, facilitates the outcomes identified in the SRMA objective. Additionally, eight ERMAs would be designated. These RMAs would cover the entirety of GSENM.
- **OHV Use:** WSAs/instant study areas (ISAs), lands with wilderness characteristics identified for the protection of those characteristics, and No Mans Mesa RNA (ACEC) would be closed to OHV use. The remainder of GSENM would limit OHV travel to designated routes, with some siting criteria identified. No areas would be designated as OHV-open.
- **Recreational shooting:** Recreational shooting would be prohibited within 0.25 miles of residences, from, on, or across highways, campgrounds, and developed recreation facilities. RNAs (ACECs) and WSAs/ISAs would be closed to recreational shooting.
- **Recreational Facilities:** To provide for public health and safety, recreational facilities, such as designated campgrounds and bathrooms, may be developed at some locations. Recreational facilities would be allowed in accordance with RMA prescriptions.
- **Livestock Grazing:** Allotments that are not under permit would be made unavailable for livestock grazing. Allocated AUMs would be the total permitted use of available allotments. Land health assessments would be required within 2 years of the signing of the record of decision (ROD) on allotments within watersheds that have shown a high degree of departure from reference conditions (henceforth, departed watershed). These nine HUC-10 and HUC-12 watersheds (see **Figure 3-24, Departed Watersheds, Appendix A**) were identified using data and methods determined by BLM Utah State Office relating to water, soils, and vegetation resources. Further analysis is discussed in **Appendix B**. Changes in grazing practices would be made according to the results of the land health assessments and determinations. New range improvements could be allowed if they are consistent with the protection of GSENM objects. The BLM would prohibit nonstructural range improvements with a primary purpose of increasing forage for livestock. Maintenance of existing structural range improvements would be allowed if both the structural range improvement and maintenance are consistent with the protection of GSENM objects.

- ACEC and RNAs (ACECs): The BLM would designate two RNAs (ACECs). The purpose of these designations would be to protect intact ecosystems where special management—beyond the typical protections provided in GSENM—would be required to protect [important resources](#).
- Vegetation Management: Landscape-scale restoration projects would be used to restore functional and resilient vegetation communities. For all vegetation management efforts, potential for lasting resilient restoration would be maximized through the preferential use of native vegetation. Nonnative vegetation may be used in restoration efforts as consistent with project and site-specific consideration and rationale. New discretionary actions would be avoided within 330 feet of riparian areas unless the action would improve riparian health and result in no adverse impacts on wetlands and riparian areas.
- Other Discretionary Actions: Alternative B would accommodate other discretionary actions, such as ROW authorizations. Areas closed to ROW authorizations would include lands with wilderness characteristics, RNAs (ACECs), ACECs, WSAs, the Old Spanish National Historic Trail, and suitable wild segments of wild and scenic rivers. All other lands would be either avoidance areas or open for ROWs, permits, and leases. To ensure discretionary uses are consistent with the protection of GSENM objects, the BLM would evaluate proposed actions on a project-by-project basis.
- Lands with Wilderness Characteristics: The BLM would manage some lands with wilderness characteristics to protect those characteristics (that is, size, naturalness, and opportunities for solitude or primitive and unconfined recreation). [Therefore, the BLM would eliminate or limit discretionary uses in these areas. For the remaining lands with wilderness characteristics, the BLM would consider discretionary uses that do not protect wilderness characteristics.](#)
- Transportation and Access: Routes could be maintained and improved to meet public health and safety needs and/or to protect GSENM objects.

### ES.4.3 Alternative C

Alternative C emphasizes the protection and maintenance of intact and resilient landscapes using an area management approach to selectively allow for discretionary uses in appropriate settings. Four management areas similar to those used in the 2000 GSENM Management Plan would be established: the front country area passage area, outback area, and primitive area. [Under Alternative C, the designation of management areas would serve primarily as a tool for managing visitation and allowable uses while also protecting GSENM objects.](#) Area descriptions under Alternative C include the following:

- Front Country Area – The front country area is the focal point for visitation and provides day-use and overnight opportunities that are supported by developed infrastructure. Educating visitors about GSENM objects and resources and their historic and scientific importance will be emphasized. The front country area allows for visitor centers and contact stations, primary day use and interpretation sites, highway waysides, and overlooks, developed trails and trailheads, and developed campgrounds. The facilities in this area could accommodate larger groups.
- Passage Area – The passage area is the secondary area for visitation and provides day use and overnight opportunities that are less developed than those found in the front country area. The passage area allows for secondary travel routes that are a mix of paved and unpaved roads, which receive use as throughways, scenic driving routes, and provide access to recreation destinations. It also provides access to outback and primitive day use and overnight opportunities. The passage area is intended to provide basic recreational infrastructure to support a range of recreational

activities and allow visitors to learn about GSENM objects and resources. This basic infrastructure includes and could include additional trailheads, day use and picnic sites, small campgrounds and designated camping areas, toilets, interpretive sites, waysides and overlooks.

- Outback Area – The outback area provides a self-directed visitor experience while accommodating motorized and mechanized access on designated routes. Facilities will be rare and provided only when essential for resource protection or public safety.
- Primitive Area – The primitive area provides an undeveloped, primitive, and self-directed visitor experience without motorized or mechanized recreational access. Facilities will be nonexistent, except for limited signs for resource protection or public safety.

Additional descriptions of Alternative C include the following:

- RMAs: Fourteen SRMAs would be designated to [protect and enhance a targeted set of activities, experiences and benefits, and desired](#) recreation setting characteristics. The BLM also would designate eight ERMAs. These RMAs would not cover all lands within GSENM.
- OHV Use: The primitive area and some areas, such as No Mans Mesa, WSAs/ISAs, some lands with wilderness characteristics, would be closed to OHV use; the remainder of GSENM (front country, passage, and outback areas) would limit OHV travel to designated routes. Siting criteria would be identified, especially in important resource areas, to ensure the protection of GSENM objects. No areas would be designated as open to OHV use.
- [Recreational shooting](#): [Recreational shooting](#) would be prohibited in the front country and primitive areas. In the passage and outback areas, [recreational shooting](#) would be prohibited within 0.25 miles of residences, campgrounds, and developed recreation facilities.
- Recreational Facilities: Management areas would identify areas in which recreational facilities could be developed to meet future recreational needs. In general, the front country would allow for facilities to accommodate larger groups, while facilities would be nonexistent in the primitive area.
- Livestock Grazing: [As under Alternative B, all allotments that are not under permit would be made unavailable for livestock grazing.](#) Allocated AUMs would be the total permitted use of available allotments. Land health assessments would be required within 2 years of the RMP/EIS record of decision on allotments within departed watersheds. Changes in grazing practices would be made according to the results of the land health assessments and determinations. No new structural range improvements would be permitted unless a current (within the last 10 years) land health assessment and determination are completed for the allotment, unless the improvement would [prevent imminent damage to](#) GSENM objects. The BLM would prohibit nonstructural range improvements with a primary purpose of increasing forage for livestock.
- ACEC and RNAs (ACECs): Under this alternative, the BLM would designate [two](#) RNAs (ACECs).
- Vegetation Management: For all vegetation management efforts, maximize potential for lasting resilient restoration through the preferential use of native vegetation. Nonnative vegetation may be used in restoration efforts as consistent with project and site-specific consideration and rationale. To best support recovery of site integrity and resilience, use adaptive management to ensure that health of these efforts is maintained. The front country, [passage, and outback](#) areas would focus on proactive management, while the primitive area would focus on natural processes. New discretionary actions would be avoided within 330 feet of riparian areas in all areas. In the



front country, passage, and outback areas, the action must not result in adverse impacts on wetland and riparian areas. In the primitive area, the action must enhance the riparian area.

- **Other Discretionary Actions:** Alternative C would prohibit soil-disturbing actions in the outback and primitive areas to protect and restore soil health, which is foundational for healthy ecosystems. Areas closed to ROW authorizations would include lands with wilderness characteristics, RNAs (ACECs), ACECs, WSAs, the Old Spanish National Historic Trail, and suitable wild and scenic river segments classified as wild (that are within the outback and primitive areas), and the primitive area. All other lands would be either avoidance areas or open for ROWs, permits, and leases. The BLM would authorize access ROWs to private inholdings, if required by law or regulation.
- **Lands with Wilderness Characteristics:** All lands with wilderness characteristics in the primitive area would be managed to protect those characteristics (that is, size, naturalness, and opportunities for solitude or primitive and unconfined recreation) while providing for compatible uses. The BLM would manage all lands with wilderness characteristics in the passage and outback areas to minimize impacts on wilderness characteristics while allowing for compatible uses. Only lands with wilderness characteristics in the front country area would **not** be managed to **prioritize the protection of those** characteristics.
- **Transportation and Access:** Routes could be maintained and improved to meet public health and safety needs and to protect GSENM objects.

#### ES.4.4 Alternative D

Alternative D strives to maximize natural processes by minimizing active management and limiting discretionary uses. Land use allocations would curtail discretionary uses, including recreation, livestock grazing, ROWs, and activities under special recreation permits. This alternative would **also constrain active management even when it could restore resilient natural conditions and ecosystem functions**. Alternative D includes the following:

- **RMA:** The BLM would designate **nine** SRMAs and **five** ERMAs under this alternative. These RMAs would not cover all lands within GSENM. This alternative would designate the least amount of acres within RMAs.
- **OHV Use:** This alternative would designate more lands as closed to OHV use than any other alternative. Siting criteria would be identified to ensure the protection of GSENM objects. No areas would be open to OHV use.
- **Recreational shooting:** **Recreational shooting** would not be allowed anywhere within the boundaries of GSENM.
- **Recreational Facilities:** Recreational facilities would be allowed in accordance with RMA prescriptions. The BLM would prohibit new facilities in areas outside RMAs, except for signage.
- **Livestock Grazing:** Allotments that are not under permit would be made unavailable for livestock grazing. For all allotments in GSENM, completed land health assessments and fully processed permit renewals would be required within 10 years of the signing of the record of decision. No new structural range improvements would be permitted unless a current (within the last 10 years) land health assessment and determination are completed for the allotment, unless the improvement would **prevent imminent damage to** GSENM objects. **With current land health assessment and determinations, new improvements would need to enhance the protection of**

**GSENM objects.** Nonstructural range improvements with a primary purpose of increasing forage for livestock would be prohibited.

- **ACEC and RNAs (ACECs):** Under Alternative D, management of the previously designated No Mans Mesa RNA (ACEC) would continue. No new ACECs would be designated.
- **Vegetation Management:** Vegetation management methods would prioritize natural processes and techniques over other methods. New discretionary actions would be avoided within 330 feet of riparian areas unless the action would enhance riparian areas. Nonnative species could only be used with approval or for emergency actions.
- **Other Discretionary Actions:** The BLM would authorize access ROWs to private inholdings, if required by law or regulation. Under Alternative D, the BLM would manage the most acres of ROW exclusion. Under Alternative D, corridor 68-116 would no longer be designated as a 368 Energy Corridor under the Energy Policy Act of 2005, and the BLM would no longer focus placement of major ROWs in that corridor.
- **Lands with Wilderness Characteristics:** The BLM would manage all lands with wilderness characteristics to protect those characteristics (that is, size, naturalness, and opportunities for solitude or primitive and unconfined recreation) while providing for compatible uses.
- **Transportation and Access:** Routes could be maintained and improved to meet public health and safety needs.

#### **ES.4.5 Alternative E (Proposed RMP)**

Alternative E, the Proposed RMP, is based on Alternative C, the preferred alternative, and similarly emphasizes the protection and maintenance of intact and resilient landscapes using an area management approach to selectively allow for discretionary uses in appropriate settings. Four management areas, identical to those used in Alternative C, would be established: the front country area, passage area, outback area, and primitive area.

Descriptions of Alternative E include the following:

- **RMAs:** The same 14 SRMAs and eight ERMAs would be designated as under Alternative C. These RMAs would not cover all lands within GSENM.
- **OHV Use:** The same areas would be closed, and limited to OHV use as under Alternative C; however specific siting criteria would not be identified in Alternative E. Rather, future route designation would have to protect or enhance GSENM objects and resources and/or increase public safety.
- **Recreational Shooting:** Recreational shooting would be prohibited in the front country area and within 600 feet of locations with archaeological and historic resources throughout GSENM. In the passage, outback areas, and primitive areas recreational shooting would be prohibited within 600 feet of residences, campgrounds, and developed recreation facilities.
- **Recreational Facilities:** Alternative E would include the same management area-based allowance for the development of recreational facilities as under Alternative C.
- **Livestock Grazing:** The same allotments that would be made unavailable for livestock grazing under alternatives B and C would be unavailable under alternative E. Additionally, four pastures would be unavailable for livestock grazing but would allow livestock trailing as necessary. Allocated

AUMs would be the total permitted use of available allotments. Land health assessments requirements and range improvement directions would be the same as under Alternative C.

- ACECs and RNAs (ACECs): The same two RNAs (ACECs) would be designated as under Alternative C.
- Vegetation Management: For vegetation management efforts, preferential use of native vegetation, adaptive management, avoidance of riparian area, and management area-based strategies would be similar to those under Alternative C.
- Other Discretionary Actions: Alternative E would include the same or similar management for soil-disturbing actions and ROW authorizations as Alternative C and include the OSNHT Management Corridor as ROW avoidance.
- Lands with Wilderness Characteristics: Under Alternative E, lands with wilderness characteristics would be managed in the same management area-based manner as Alternative C.
- Transportation and Access: Route maintenance and improvement would be managed the same as under Alternative C.

## ES.5 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

### **Air Resources**

Impacts on air quality from travel and transportation management, vegetation management, prescribed fire, and livestock grazing are anticipated to be similar across alternatives because the levels of activity would not vary substantially by alternative. The demand for recreation and OHV use is expected to continue to increase, resulting in increased combustion-related emissions that would be similar across alternatives. In addition to emissions from the operation of motorized vehicles, motorized vehicle use on unpaved roads and trails would create localized fugitive dust impacts that would vary by alternative. Within areas closed to OHV travel, fugitive dust emissions would decrease, especially as disturbed areas are reclaimed over time and become less susceptible to windblown dust. Closing roads and trails to motorized use in some areas could concentrate these uses in the areas that remain open to this use, increasing localized emissions and associated impacts in these areas. The No Action Alternative (Alternative A), which has no areas closed to OHV use, would allow for continued localized air quality impacts across the greatest portion of the decision area. Alternative D would have the most restrictions (77.1 percent closed) on OHV travel across the decision area, followed by Alternatives C and E (65 percent closed), and Alternative B (51 percent closed).

Methane emission from livestock grazing is a primary source of total GHGs from activities in GSENM. Alternative A, with the highest number of allowed AUMs would result in the most methane emissions and impacts on climate change, while Alternative D would have the least impacts. Although prescribed fire and active vegetation management under Alternatives B, C, and E would result in the largest GHG emissions from equipment use, they would not be substantial compared with impacts from grazing. With proper grazing techniques, some of the emitted carbon can be sequestered and stored in soil and vegetation. Active vegetation management under Alternatives B, C, and E would improve vegetation health and diversity, which would increase the carbon sequestration and storage potential in GSENM. Active vegetation management under Alternatives B, C, and E would also improve landscape resiliency to wildfires more quickly compared with Alternatives A or D, which would also offset some of the climate change impacts from other actions.

### **Soil Resources**

Land management actions would directly and indirectly impact soil resources within the decision area, including activities associated with ROW development and special land use designations, recreation management, management of livestock grazing, and vegetation and forest management. The decision area contains several soils with special characteristics and biological soil crusts that may limit the potential of these soils to be suitable or compatible with certain management activities; these soils would be directly impacted by ground-disturbing activities.

All **five** alternatives would, at a minimum, seek to manage uses to **minimize** damage to and degradation of soil resources and to ensure that appropriate soil health parameters would be maintained or improved. Additionally, all **five** alternatives would aim to facilitate appropriate research to improve understanding and management of soil resources and biological soil crusts. Under Alternative A, more acreage would remain open for ROW authorizations, OHV use, recreation, and livestock grazing compared with the other alternatives, resulting in potentially more ground disturbance that would impact soils and degrade soil health parameters and biological soil crusts. Therefore, more impacts on sensitive soils, biological soil crusts, and soil health and function would be expected under Alternative A. Alternatives **B, C, and E** would allow a middle ground in terms of acres that would be open to ground-disturbing activities, while Alternative D would generally be the most restrictive alternative. **Overall, Alternative E would have similar if not identical impacts to soil resources as Alternative C.**

### **Vegetation, Including Special Status Plants**

Alternatives A and B would likely have greater success in moving vegetation conditions toward desired conditions, and **increasing the** resiliency of treated areas more quickly and in more areas than Alternatives **C, D, or E**. This is because Alternatives A and B would increase the **use** of proactive vegetation management and **allow for** a wider array of vegetation management methods. This would also benefit special status plant species in the long term by helping to reduce threats such as competition with invasive species and potential for wildlife. It would improve conditions for pollinators, thereby increasing pollination opportunities for special status plants. Prioritizing natural processes under Alternative D and in the primitive management areas under Alternatives **C and E** could restrict active management of vegetation. Alternatives **B, C, and E** would increase the options for post-fire stabilization and rehabilitation, including options for native and nonnative seedings and complementary treatments to enhance seeding success. This would help to maintain and improve vegetation conditions in burned areas to a greater degree than if these options were not allowed.

Alternatives A and B would place the most emphasis on increasing recreational opportunities. This could increase the amount of noxious and invasive species and degrade vegetation and outcompete special status plant species located in recreation areas and along designated routes. It also could increase the potential for human-caused ignitions in these areas. This could **also cause** an increased risk of uncharacteristic fire and decreased vegetation resiliency, compared with management under Alternative D, which would manage fewer of these recreation areas. Of the alternatives, Alternative D would generally include the most allocations to protect lands with wilderness characteristics and other sensitive areas, leading to less impacts on vegetation and special status species from discretionary uses.

Alternative A would have the most AUMs and acres available to grazing compared with Alternatives **B, C, D, and E**. This could result in an increased risk of impacts on vegetation conditions and resiliency due to impacts from improper grazing. Alternative D would have the least number of AUMs and acres available

for grazing across all alternatives, which would reduce impacts on vegetation and special status species from grazing. Overall, Alternative E would have similar if not identical impacts to vegetation as Alternative C.

Regardless of alternative, the planning area will experience increased risk of uncharacteristically large and severe fire due to warmer temperatures, altered precipitation patterns, longer fire seasons, and more extreme fire weather. Climate change effects will combine with and exacerbate some of the effects of the alternatives, especially those that would increase fuels from invasive plants and increase the risk of human-caused fire. These factors would be expected to result in more fire ignitions, more acres burned, and less resilient vegetation conditions.

### **Water Resources**

Under Alternative A, water resources would be managed to protect and maintain water and natural flows, including water flowing into GSENM from adjacent lands. Alternative A is less protective against impacts than Alternatives C, D, and E because it allows new water developments with no restriction, where Alternatives C and E would limit certain types of new water developments in the front country, passage, and outback areas and Alternative D would prohibit new water developments unless beneficial for natural resource maintenance, restoration, or protection of GSENM objects.

Under Alternative B, resources would be managed to maximize the potential for discretionary actions that are compatible with the protection of GSENM objects. Alternative B provides additional goals of management related to maximizing goals and objectives of GSENM, rather than just maintaining the current hydrology/water quality.

Alternative A is less protective against impacts than Alternative B because under Alternative A, maintenance of existing water developments is to improve livestock and wildlife distribution, while maintenance of water developments under Alternative B would be done to protect, restore, and/or increase the resiliency of GSENM objects.

Alternatives C, D, and E would be the most protective of hydrology within GSENM. Under Alternatives C and E, resources would use area management to carefully allow for discretionary uses in appropriate settings. Alternatives C and E would be more protective of water supply than Alternative B. In the front country area, Alternatives C and E would allow development and maintenance of water sources to support recreation and visitor-related uses. In the passage, outback, and primitive areas, they are similar to Alternative D in that they would prohibit new recreation related water developments, unless necessary for natural resources maintenance, restoration, or protection of GSENM objects. Additionally, under Alternatives C and E, in the primitive area, new water developments would be prohibited unless a primary purpose of the water development is to protect or restore the resiliency of GSENM objects; and it would maintain water developments for livestock or wildlife or modify them if it protects, restores, and/or increases resiliency of GSENM objects. These management directions would be the same as Alternative D; however, in the front, outback, and passage areas, these water developments would be allowed if they contribute to the protection, restoration, and/or increase the resiliency of GSENM objects, the same as Alternative B.

Under all alternatives, measures are required to stabilize soils and minimize surface water runoff for actions on slopes greater than 10 percent. Surface-disturbing activities result in disruption or damage of

biological soil crusts and create opportunities for the establishment and spread of noxious weeds that provide less vegetative cover than native species (Scott et al. 2017). Impacts on water resources that are associated with soil erosion from water development include decreased water quality in groundwater and surface water and the potential for contamination to groundwater. Management under Alternatives C, and D, and E are more protective against impacts on water resources than Alternative A because Alternatives C, D, and E prohibit soil disturbing actions on areas where soils are mapped and considered as fragile, which can affect water resources through increased erosion and sedimentation, alterations to geomorphology, natural flood control, and pollutant loading.

### **Noxious Weeds and Invasive, Nonnative Plants**

Alternatives A and B, in comparison with Alternatives C, D, and E, would likely have greater success in moving vegetation conditions toward desired conditions, which includes a reduction or eradication of noxious and invasive, nonnative species. Alternative A and B would increase resiliency of treated areas more quickly and in more areas through proactive vegetation management and using a wider array of vegetation treatment methods than Alternatives C, D, or E. Prioritizing natural processes under Alternative D and in the primitive management areas under Alternative C and E could restrict active management of vegetation.

Alternatives B, C, and E would also increase the options for post-fire stabilization and rehabilitation, including options for native and nonnative seedings and complementary treatments to enhance seeding success. This would help to reduce the establishment and spread of noxious and nonnative, invasive species in burned areas to a greater degree than if these options were not allowed.

Alternatives A, B, C, and E would place the most emphasis on increasing recreational opportunities, including for motorized and nonmotorized recreation. This could increase the amount of noxious and nonnative, invasive species and fine fuels in recreation areas and along designated routes. This could result in an increased risk of uncharacteristic fire and decreased vegetation resiliency, compared with management under Alternative D, which would manage fewer of these recreation areas. Alternative A also allows for open OHV travel which would increase vectors of weed spread on 116 acres of open OHV area within GSENM. Of all the alternatives, Alternative D would generally include the most allocations to protect lands with wilderness characteristics and other sensitive areas, leading to less impacts from discretionary uses.

Alternative A would have the most AUMs and acres available to grazing compared with Alternatives B, C, D, and E. This would result in increased surface disturbance and vectors for noxious and invasive species spread. Alternative D would have the least number of AUMs and acres available for grazing across all alternatives, which would reduce the influence of grazing on weed spread in these areas. Overall, Alternative E would have similar if not identical impacts to noxious weeds and invasive species as Alternative C.

Regardless of alternative, the planning area will experience increased risk of uncharacteristically large and severe fire due to warmer temperatures, altered precipitation patterns, longer fire seasons, and more extreme fire weather. Climate change effects will combine with and exacerbate some of the effects of the alternatives, especially those that would increase invasive plants and increase the risk of native communities converting to invasive-dominated communities. These factors would be expected to result

in increased fuels from invasive plants, more fire ignitions, more acres burned, and less resilient vegetation conditions.

### **Cultural Resources**

Under Alternative A, plan elements specific to cultural resources would remain from the 2020 Approved RMPs. These plan elements include direction for the identification, preservation, and protection of cultural resources; the reduction of threats and conflicts from other resources; restoration and stabilization of cultural resources; opportunities for traditional use; and the development of cultural resource management plans. Under each action alternative, plan elements specific to cultural resources would be similar in intent to those of Alternative A. However, they would move the plan elements—reducing the threats and conflicts, [addressing](#) important and at-risk resources, and providing opportunities for traditional uses—from goals and objectives to management directions. This would make them more action oriented and add detail, such as specific direction to avoid, reduce, or remove imminent and long-term threats and to identify, monitor, and [addressing](#) at-risk cultural resources.

Alternatives B, C, D, and E include a plan element to employ the cultural resources predictive model to manage authorizations in high-probability areas; Alternative A does not include this plan element. The model statistically evaluates the relationships between known site locations and environmental variables to predict the likely occurrence of cultural resources across GSENM. Under Alternative A, the highest number of known cultural resources, and the most acres with a high probability for cultural resources, could be impacted from management decisions. Project-specific Section 106 compliance would seek to avoid, minimize, or mitigate any adverse effects on cultural resources however, the risk for unintentional impacts would be greatest under Alternative A.

Alternatives B, C, D, and E include management decisions related to a variety of resources that reduce the potential for impacts on cultural resources, compared with Alternative A. Alternative D would offer the greatest reduction for potential impacts on known cultural sites and in areas with a high probability for cultural resources. While there would be fewer acres of RNAs (ACECs) to potentially protect unknown resources under Alternative D, compared with Alternatives B, C, and E, this is counteracted by the greater acreages of provisions limiting ground-disturbing activities under Alternative D, such as visual resource management (VRM) classifications, lands with wilderness characteristics management, livestock grazing unavailability, ROW exclusion, and OHV closures. Alternative A includes the greatest number of allotments that are available for grazing and, therefore, the highest risk to cultural resources. Alternatives B, C, and D offer an increasing amount of reduction, respectively, of potential adverse impacts on cultural resources within allotments, compared with Alternative A. Overall, Alternative E would have similar if not identical impacts to cultural resources as Alternative C.

### **Tribal Interests**

Under Alternative A, current conditions and trends influencing impacts on tribal interests, such as water resources, plant communities, and cultural landscapes, would continue as they are now. Many aspects of management related to a diversity of resources would influence impacts on tribal interests under the alternatives considered. Alternative A would have the largest impacts on tribal interests from cultural resource management, livestock grazing, travel management, OHV use, management of lands with wilderness characteristics, designation of RMAs, and ROW development. Acreages of land management allocations and management directions that would influence these impacts change with each alternative,

with the allocations under Alternative D generally being the most protective of tribal interests. Although Alternative D would offer the most protection to tribal interests through restriction of discretionary uses.

Alternatives B, C, D, and E contain similar management direction related to tribal co-stewardship. Alternative A provides general guidance for tribal co-stewardship; however, under Alternatives B, C, D, and E this guidance would be more explicit in directing how to protect tribal interests and foster tribal involvement in the land use planning process and subsequent management of GSENM. Overall, Alternative E would have similar if not identical impacts to Tribal Interests as Alternative C.

### ***Paleontological and Geological Resources***

Under Alternative A, paleontological resources would continue to be managed in accordance with the 2020 GSENM and KEPA RMPs, except where those management decisions do not align with Proclamation 10286. While specific goals, objectives, and management direction varies slightly between Alternative A and Alternatives B, C, D, and E, many of the key elements are the same. For Alternatives B, C, D, and E, management includes slightly more emphasis on implementation of plans and management strategies in addition to development of protocols.

Management for other resources, including vegetation management, maximum soundscape decibels on the A-weighted scale, and group size limits, could have an impact on paleontological resources. For example, more invasive vegetation management options authorized under Alternative A, or possibly allowed under Alternatives A and B, would result in more ground disturbance, and if in an area with paleontological resources (such as potential fossil yield classification Class 4 or 5) could result in increased potential for impacts. Whereas limitations on maximum decibels on the A-weighted scale in specific or defined locations under Alternatives B, C, D, and E could limit the types of paleontological resource excavation equipment, including handheld devices (such as jack hammers and rock saws) that could be used (unless exceptions are allowed). Group size limits could limit the maximum number of field crew members in specific locations; this is most restrictive under Alternative D. Additionally, for all alternatives, soil management and VRM may require additional approvals prior to paleontological excavation (such as on slopes greater than 30 percent) or after an excavation is initiated but not completed within a specific period (such as 2 or 3 years).

Based on potential fossil yield classification Classes 4 and 5 acres, Alternative A has the greatest potential for impacts to paleontological resources from ROW authorization, RMA, OHV travel, and grazing management decisions. Under Alternative A, the smallest acreage would be protected through the management of special areas (such as RNAs [ACECs] and lands with wilderness characteristics).

Special designations and restrictions on surface disturbance reduce the potential for impacts on paleontological resources as they would restrict the frequency and extent of surface-disturbing activities and recreation uses that could adversely affect paleontological resources. Thus, compared with Alternative A, management under Alternatives B, C, D, and E would reduce potential impacts on paleontological resources as they all include an increase in area managed as limited or closed for specific ground-disturbing activities. Overall, Alternative E would have similar if not identical impacts to paleontological and geological resources as Alternative C.

Under Alternative A, there are no defined goals, objectives, or management directions for geological resources (or unique geological features). In contrast, Alternatives B, C, D, and E provide geological



resource management directions for identification of geological sites appropriate for public access and proactively maintaining an annual inventory, monitoring of, and, where appropriate, collecting and curating geological resources, with a focus on areas identified in Proclamation 10286.

### ***Fish and Wildlife, Including Special Status Wildlife***

Many goals, objectives, management directions, and allocations for wildlife and fish would remain the same or be similar under all alternatives. These directives provide protection for wildlife and habitats while allowing for other discretionary uses. Management direction for all alternatives would include limiting discretionary uses to protect and recover special status species' (BLM Utah sensitive species and federally listed threatened, endangered, proposed, or candidate plant, animal, or fish species) habitats and populations.

Alternative A would allow for maximum discretionary uses and emphasize management flexibility. Under Alternative A, current trends pertaining to wildlife and habitat, including special status species, would likely continue. Alternative B would emphasize flexibility in planning-level direction to maximize the potential for an array of discretionary actions that would be compatible with the protection of GSENM objects. The allowance of discretionary actions under Alternative B would likely result in impacts on wildlife, including special status species, and wildlife habitat that would be similar to the impacts under Alternative A.

Alternatives C and E would emphasize the protection of intact and resilient landscapes using an area management approach to allow for discretionary uses in appropriate settings. Under Alternatives C and E, more protection in the primitive area would likely reduce impacts on wildlife as compared with Alternative A. The front country, passage, and outback areas would allow for more discretionary uses and therefore would likely have similar impacts on wildlife and habitat as Alternative A. However, because proactive management would not be prioritized, habitats in the primitive area could restrict the use of tools that would be beneficial for habitat improvements. Overall Alternative E would have similar if not identical impacts to fish and wildlife as Alternative C.

Alternative D would maximize natural processes by limiting discretionary uses. This alternative would also constrain management actions to emphasize natural conditions, such as passive vegetation management. Alternative D would protect more wildlife and habitat through land use allocations and therefore reduce impacts on wildlife and habitat as compared with Alternative A. However, by emphasizing natural processes as opposed to active management, this alternative would also limit some management actions or extend the time it would take to achieve desirable conditions that could improve wildlife habitat.

### ***Visual Resources***

Alternative A would continue to manage large portions of GSENM under VRM Class I and II objectives where management activities would preserve or retain the natural landscape character and not attract the attention of casual viewers. Under Alternative A, the BLM would continue to manage portions of landscapes inventoried as having high scenic quality under VRM Class III and IV objectives where management activities could moderately alter (VRM Class III) or dominate (VRM Class IV) the characteristic landscape.

Alternatives B, C, D, and E would not manage any GSENM lands with VRM Class IV objectives. They, therefore, would not allow for major modification of the characteristic landscape. In Alternative B, the

portion of The Cockscomb within the congressionally designated utility corridor along U.S. Highway 89 would be managed with VRM Class III objectives though it inventoried as a high scenic quality landscape; this would allow future utility projects to moderately alter the area's landscape character. Under Alternative C and E no landscapes inventoried as having high scenic quality would be managed for VRM Class III objectives. Alternative D would only assign VRM Class I or II objectives to GSENM lands, resulting in all landscapes retaining their landscape character.

Under Alternatives A and B, between approximately 47 percent and 51 percent of GSENM lands would be managed with VRM Class I objectives where only negligible and natural process changes to landscape would be allowed; under Alternative C and E the acres would increase to 60 percent, and under Alternative D they would increase to 77 percent. Under Alternatives A and D, approximately 25 percent of lands would be managed as VRM Class II objectives, which allow only minor changes in the landscape character such that the attention of the casual observer is not attracted. Under Alternative B, C, and E, approximately 30 percent of GSENM would be managed for VRM Class II objectives. Alternatives A and B would allow for the most acres to be managed as VRM Class III (19 percent) where projects could modify the landscape character such that changes could attract the attention of the casual observer, and Alternative D would not allow any lands to be managed to these objectives. Alternative C and E would allow for 6 percent of GSENM to be managed with VRM Class III objectives. Only Alternative A allows for any lands within GSENM (12 percent) to be managed for objectives that allow major modification of the landscape character (VRM Class IV).

VRM Class I and II objectives are the more protective of scenic values. Comparing alternatives, Alternative D is the most protective because it manages the entire GSENM under these two VRM classes. The level of protection lessens across alternatives from C and E to B to A, with Alternative A being the least protective of scenic values with 20 percent of the GSENM managed as VRM Class III and 12 percent VRM Class IV. Overall, Alternative E would have similar if not identical impacts to visual resources as Alternative C.

### **Dark Night Skies**

Under Alternative A, existing trends associated with dark night skies would continue. Under Alternatives B, C, D, and E the BLM would seek International Dark Sky Place status for GSENM. Because the BLM does not have the ability to restrict or prohibit lighting outside GSENM, impacts on dark night skies from adjacent communities and more distant cities would be similar under all alternatives. Alternatives C, D, and E would be the most protective of dark night skies, followed by Alternative B, with Alternative A resulting in the greatest potential impacts on dark night skies. Overall Alternative E would have similar if not identical impacts to dark night skies as Alternative C.

### **Natural Soundscapes**

Under Alternative A, the application of BMPs outlined in the 2020 GSENM RMPs would continue with no specific areas identified where noise-producing facilities would be prohibited, no limitation on where drone takeoffs and landing could occur, and no further limitations on where OHV use could occur. These would result in continued impacts on soundscapes within GSENM.

Alternatives B, C, D, and E would identify specific areas where no noise-generating facilities could occur. They also would include additional management prescriptions to limit noise in other areas, limits on where drones can take off and land, identification of appropriate landing areas and landing strips for aircraft, and

the expansion of areas closed to OHV use. These would result in further protection of soundscapes compared with Alternative A. Additionally, Alternatives B, C, D, and E would establish quiet hours at campgrounds, designated camping locations, and other locations, including potential intermittent noise from generators associated with recreational use. These quiet hours would further protect soundscapes where concentrated recreation use occurs. Noise-producing facilities would be most limited under Alternatives C, D, and E because these alternatives identify larger portions of GSENM as either closed to OHV use or where noise-generating facilities would be specifically prohibited.

Under Alternative A, increased noise levels could occur near all of the GSENM noise-monitoring locations, whereas Alternatives B, C, D, and E would further protect soundscapes adjacent to these monitoring locations. To restore natural soundscapes, under Alternatives B, C, D, and E, existing facilities that generate sounds would be retrofitted to reduce sound generated below the identified thresholds under each alternative, to the extent possible. Overall, Alternative E would have similar if not identical impacts to natural soundscapes as Alternative C.

### **Fire and Fuels Management**

Alternatives B, C, and E would likely move the vegetation condition and fuel loading toward desired conditions, and increase resiliency of treated areas more quickly and in more areas than Alternatives A or D. Alternatives B, C, and E would increase the potential amount of proactive vegetation management to reduce hazardous fuels, and would allow a wider array of vegetation management methods than under Alternative A. Alternative D, using only natural processes would not be as effective in vegetation communities that are most departed from historical conditions, due to the amount of hazardous fuel loading in these areas and the increased potential for catastrophic wildfire. Alternatives B, C, and E would also increase the options for post-fire stabilization and rehabilitation relative to Alternatives A and D, including options for native and nonnative seedings and complementary treatments to enhance seeding success. This would help maintain the vegetation condition and fire regime in burned areas to a greater degree than if these options were not allowed.

Alternatives A, B, C, and E would place the most emphasis on increasing recreational opportunities. This could increase the amount of fine fuels in recreation areas and along designated routes and increase the potential for human-caused ignitions in these areas. This could result in more fires and more acres burned, compared with management under Alternative D, which would manage fewer of these areas. When fires ignite in GSENM, allocations to protect lands with wilderness characteristics and other sensitive areas could make fire response more complex or difficult; this is because some response methods could be restricted to protect the wilderness character or other sensitive resources. Of the alternatives, Alternative D would generally have the most of these allocations. Overall, Alternative E would have similar, if not identical, impacts to fire and fuel management as Alternative C.

Regardless of alternative, the planning area will experience an increased risk of uncharacteristically large and severe fire due to warmer temperatures, altered precipitation patterns, longer fire seasons, and more extreme fire weather. Climate change effects will combine with and exacerbate some of the effects of the alternatives, especially those that would increase fuels from invasive plants and increase the risk of human-caused fire from more recreational use. These factors would be expected to result in more fire ignitions, more acres burned, and movement away from historical vegetation conditions and fire regimes.

### **Lands with Wilderness Characteristics**

Alternative A would continue to manage all lands with wilderness characteristics (559,600 acres) to allow for other uses. By comparison, Alternative B would manage 72,000 acres for the protection of wilderness characteristics and 487,600 acres would be managed for other compatible uses while not protecting wilderness characteristics. Alternative C would manage 240,600 acres of lands with wilderness characteristics for the protection of those characteristics, 312,800 acres would be managed to minimize impacts on wilderness characteristics while allowing compatible uses that are consistent with the protection of GSENM objects, and 6,100 acres would be managed for other compatible uses while not protecting wilderness characteristics. Alternative D would manage all lands with wilderness characteristics in GSENM (559,600 acres) for the protection of those characteristics while providing for compatible uses. Under all alternatives, compatible uses may be allowed in lands with wilderness characteristics that are managed for the protection of those characteristics, if they are consistent with the protection of GSENM objects. Alternative E would manage 329,400 acres of lands with wilderness characteristics for the protection of those characteristics, 224,100 acres would be managed to minimize impacts on wilderness characteristics while allowing compatible uses that are consistent with the protection GSENM objects, and 6,100 acres would be managed for other compatible uses while not protecting wilderness characteristics. Overall, Alternative D would provide the most acres being protected through the management of lands with wilderness characteristics, however, only Alternative E adds further manageability protections, with additional design and other conditions on authorizations for compatible uses that would avoid, minimize, or compensate for impacts.

### **Livestock Grazing**

Alternative A would include the most acres available for livestock grazing (2,117,300) and the most AUMs for permitted use. Additionally, under Alternative A, all suspended AUMs could be activated over time, increasing the overall availability of forage over the long term, as rangeland conditions allow. Compared with Alternative A, Alternatives B and C would reduce the acres available for livestock grazing by 75,200 acres (4 percent), while Alternatives D and E would reduce the available acres by 1,199,100 acres (67 percent) and 380,000 acres (18 percent), respectively. Vegetation management under Alternative B would likely have the greatest positive impact on rangeland health across the planning area, as it would emphasize widespread restoration, including seedings with native and nonnative species. Alternative C and E would manage the most acres of SRMAs, having the highest potential for recreation-livestock conflicts in these areas. Overall, Alternative D would have the greatest impacts to livestock grazing.

### **Recreation**

Under all alternatives, management for recreation would have long-term beneficial effects on GSENM's associated objects. Of all alternatives, Alternative C and E would include the greatest designation of SRMAs; therefore, it would provide the most prescriptive recreational management.

Alternative A includes the greatest portion of the decision areas as ERMAs, which could provide greater management flexibility to adapt to changes in recreational use and facility needs compared with the other alternatives. Alternative B would result in similar impacts on recreation from designation of RMAs as under Alternative A, with slightly different recreation decisions associated with the different SRMA, ERMA, and RMZ designations. Alternative D would designate the fewest acres within RMAs of all alternatives. It would limit the BLM's ability to manage for recreational opportunities; this would ultimately limit the beneficial outcomes of recreation compared with the other alternatives.

Alternative A includes the most acreage available for recreational shooting, which would continue to result in the potential displacement of recreationists seeking other recreation opportunities, which could result in conflicts with other recreational users in GSENM. Alternative B would limit access for recreational shooting, compared with Alternative A, because it manages more acreage as closed to recreational shooting. Alternative C and E would limit access the recreational shooting sports community to a larger extent than Alternatives A and B because it would manage more acreage as closed to recreational shooting. Under Alternative D, the BLM would prohibit recreational shooting across the entire GSENM. This would reduce the potential for conflicts with other recreational users compared with all other alternatives, but it also would eliminate access for all recreational shooting. This could lead to instances of unauthorized recreational shooting in GSENM.

Alternative A would be the only alternative that would allow for open cross-country OHV travel. This would provide the greatest access to OHV opportunities, could reduce unauthorized off-trail travel in other areas, and reduce conflicts between motorized recreations, compared with Alternatives B, C, D, and E. This would continue to result in damage to resources such as native vegetation that could be considered inconsistent with the protection of GSENM's objects. Alternatives B-E would eliminate access for cross-country OHV recreation across GSENM. This could result in unauthorized cross-country OHV travel occurring in certain areas and reduce access for motorized users. Under Alternative B, motorized users would likely experience greater conflicts with nonmotorized recreationists on motorized routes in OHV limited areas, as this mileage would be substantially less in Alternative B than in Alternative A. Alternative C and E would result in similar impacts on travel resulting from OHV area designations as under Alternative B, but to a greater extent due to the greater area managed as closed to OHV use. Under Alternative D, the BLM would manage the most acreage as closed to OHV travel of all the alternatives. This would limit resource damage from OHV travel on existing routes, decrease impacts on natural settings and primitive recreational experiences, and limit access for authorized all-terrain vehicle and utility-task vehicle recreation. Reduced motorized access could limit accessibility and nonmotorized opportunities in remote areas.

Pedestrian use would be allowed throughout GSENM under all alternatives. Under all alternatives, the establishment of additional recreational infrastructure would enhance recreational opportunities. Alternative A would not specifically address recreational facilities, but there would be few restrictions outside WSAs where development could occur. Alternatives B, C, D, and E would allow for recreational facilities to provide for future recreational needs, with the most restrictions on the location of facilities under Alternative D. Land use allocations would be the most limited under Alternative D and would curtail discretionary uses, including recreation and activities under special recreation permits. Overall, Alternative E would have similar impacts to recreation as Alternative C.

### **Travel Management**

Potential effects on travel management would occur to varying degrees across alternatives. Route designations are implementation-level decisions that will be analyzed and approved in accordance with the BLM's travel and transportation regulations at 43 CFR part 8340 separately through the travel management planning process. This process evaluates and designates routes to provide a high-quality travel network for a wide variety of uses. Examples of beneficial impacts of designating routes through a travel management plan include improved access, experience, and connectivity; the promotion of safety for all users; minimization of conflict among various uses of BLM-managed lands; and reduction in route redundancy, minimization of impacts to resources, and habitat fragmentation in the planning area. Travel

management plans may also provide an opportunity for coordinating transportation planning with Kane and Garfield Counties or adjacent communities. Such coordination could reduce access issues and management conflicts, improve the safety and convenience of the traveling public, and provide a more sustainable use of resources.

Alternative A is the only alternative that allows for any open cross-country OHV travel; specifically, in the Little Desert RMZ. This would provide beneficial recreational experiences for some users and could avoid instances of cross-country OHV travel in closed areas or areas limited to designated routes. Alternative A would yield the greatest benefits to travel, transportation, and access because it would manage the fewest acres of OHV closed areas of the alternatives. Management direction for landings and takeoffs of motorized aircraft in GSENM is not described in the 2020 Approved RMPs. This would yield the greatest benefits to access for motorized aircraft use because it does not place any restrictions on motorized aircraft use [beyond those imposed by the OHV area and route designations](#). However, this could limit the ability of the agencies to protect GSENM objects compared with Alternatives B, C, D, and E.

The BLM would manage the most acreage as closed to OHV use under Alternative D, limiting the potential for resource damage from OHV travel. Management under Alternative D would be most likely to adversely affect transportation and access for OHVs due to the scale of OHV closures.

Under Alternatives B, C, D, and E, [designated](#) routes could be maintained and improved to meet public health and safety needs. Appropriate landing areas and landing strips for aircraft would be considered to varying degrees under Alternatives B, C, D, and E, which could allow for increased aircraft access compared with Alternative A. [Overall, Alternative E would have similar if not identical impacts to travel management as Alternative C.](#)

### **Lands and Realty**

Under all alternatives, any pending ROW and land use authorization applications or renewals are expected to be resolved. The 137 active ROWs and land use authorizations on BLM-managed land would continue to be managed under the direction of each alternative. The BLM would also likely increase land acquisitions in GSENM. This is due to an increase in funding and staffing to the BLM land acquisition program, as well as a rise in willing seller interest.

Under Alternative A, all lands outside VSAs would be either avoidance areas or open for new ROWs, permits, and leases. This would likely increase the number of developments, such as communication sites or utility corridors, because ROWs could be approved so long as they consistent with the protection of GSENM objects. Under Alternative B, there would be more land excluded from ROWs, permits, and leases. Under Alternatives B, C, and E, the BLM could allow renewal and upgrade of existing facilities authorized under a ROW/land use authorization within the decision area.

Under Alternative C and E, there would be less land managed as ROW open and avoidance areas, and the BLM would continue to manage land designated as ROW corridors in the planning area for renewals and upgrades; however, new ROWs could be authorized outside of the preexisting designated utility corridors in ROW avoidance areas. [Overall, Alternative E would have similar if not identical impacts to lands and realty as under Alternative C.](#) Under Alternative D, new ROWs would be authorized in avoidance areas and within the preexisting U.S. Highway 89 utility corridor; however, most lands would be managed as ROW exclusion areas.

## **Special Designations for Conservation and Protection**

### *Areas of Critical Environmental Concern, Research Natural Areas, and Other Special Area Designations*

Through designation of two RNAs (ACECs), Alternatives B, C, and E would include the most protections of identified values for RNAs (ACECs). Management actions and impacts would vary by RNA (ACEC). Alternative D would not designate new ACECs or RNAs (ACECs) but would retain No Man's Mesa RNA (ACEC). Alternative A would include the least amount of protections of identified values for RNAs (ACECs), by retaining No Man's Mesa as managed under the 2020 RMPs.

### *National Trails*

All alternatives include direction for the establishment of an OSNHT management corridor, though due to the recent completion in October 2023 of the OSNHT Inventory, Assessment, and Monitoring Report (Appendix N) after the publication of the Draft EIS, only Alternative E includes a fully developed management corridor and more specific management directions addressing a range of uses. Under Alternative A, the OSNHT would continue to be managed in accordance with the 2020 GSENM and KEPA RMPs (BLM 2020a and b, respectively) BLM would also allow discretionary actions compatible with the protection of the purpose and nature, resources, qualities, values, and settings on the high-potential sites and segments of the OSNHT. Though impacts from uses and management direction could be prohibited in all alternatives if there were found to substantially interfere with the nature and purpose of the OSNHT, Alternative A includes the highest potential for user conflicts and impacts from livestock grazing, recreation, travel management, and vegetation management that could detract from the OSNHT management corridor's historic setting. Through management direction for other resources, Alternatives B and C offer progressively more protections than Alternative A, with Alternative E providing similar but slightly more protective levels than Alternative C and B. Alternative D would offer the most protections of all alternatives from management direction for other resources. However, only Alternative E includes a fully developed management corridor and specific management directions for the OSNHT.

### *Scenic Routes*

Alternative D would provide the highest level of protection of the viewsheds seen from designated scenic byways; this is because the route corridor would extend 5 miles from the route's centerline. The entire corridor would be classified as VRM Class II, which would allow for management activities to be seen but not attract the attention of the casual observer, and any changes would repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape. Alternatives B, C, and E would include the same VRM Class II designation, but the designation would only apply to the viewshed as seen from the designated routes within the foreground and middle-ground areas. This would exclude some areas in the outback area that may be covered by the Alternative D 5-mile corridor. Surface-disturbing impacts could occur in the outback area of the viewshed. Alternative A would continue to manage designated scenic routes to protect the values for which they were established. There would be no management of the viewshed as seen from the designated scenic routes and impacts within the viewshed from surface development or disturbance would continue.

### *Wild and Scenic Rivers*

Alternative D would provide the greatest level of protection for suitable wild and scenic rivers, their free-flowing condition, water quality, identified ORVs, and tentative classifications. The BLM would manage all suitable segments and their corridors as ROW exclusion, except in a designated utility corridor. Alternative C and E would provide the next-highest level of protection by managing all suitable segments

in the outback and primitive areas as ROW exclusions. The BLM would manage all other suitable segments as ROW avoidance, except in a designated utility corridor. Alternative B would provide the second-lowest level of protection with only the suitable segments with wild classification corridors managed as ROW exclusion, except in a designated utility corridor. All suitable segments within WSAs, ISAs, and protected lands with wilderness characteristics would be managed as VRM Class I. All other segments would be managed as VRM Class II. Alternative A would provide the lowest level of protection with all suitable segments, regardless of classification, managed as ROW avoidance, except in designated utility corridors and VRM Class I for only those suitable segments that fall within WSAs.

#### *Wilderness Study Areas*

Across all [action](#) alternatives WSAs would continue to be managed as VRM Class I and ROW [exclusion](#) and closed to OHV use. [WSAs would be managed similarly under alternative A, except for being managed as OHV limited, which could result in potential impacts to their wilderness characteristics.](#)

#### **Social and Economic Values**

Under all alternatives, GSENM would continue to stimulate the local and regional economy [by supporting](#) jobs, wages, economic output, nonmarket values, and ecosystem services [through](#) its uses, such as recreational opportunities and grazing and ranching allotments.

Alternative A would likely provide more [values through](#) economic [activities](#) from grazing [and recreation](#) through more jobs, labor income, and economic output than Alternatives B, C, D, [and E](#), due to the larger number of actual AUMs [and the fewer restrictions on OHV travel and discretionary actions like recreational activities.](#) Alternative B would likely provide more economic value from grazing than Alternatives C, D, [and E](#), and Alternative C [and E](#) would likely provide more economic value from grazing than Alternative D. Alternative D [would likely](#) provide less economic [contributions](#) from recreation [activities](#) than Alternatives A, B, C, [and E](#), if the BLM management decisions lead to a reduction in visitors [and visitor spending](#) due to the increase in acres closed to OHV travel, compared with Alternative A, and the potential for more limited access to products and resources. [Overall, Alternative E would have similar impacts on social and economic conditions as Alternative C.](#)

Under Alternative D, the BLM would protect the most lands with wilderness characteristics and would place the most restrictions on other uses compared with the other alternatives. This would mean the BLM management decisions under Alternative D would most likely provide more nonmarket value associated with open spaces (such as quality-of-life values), but less nonmarket values associated with recreation and grazing (such as mental and physical health and sense of place) than the other alternatives. Under Alternative A, there would continue to be no lands protected for their wilderness characteristics, which would mean that the BLM management decisions, under Alternative A, would likely provide fewer nonmarket values associated with open spaces, but might provide more nonmarket values associated with recreation and grazing than Alternative D.

#### **Environmental Justice**

Under Alternatives B, C, D, [and E](#), the BLM could maintain and improve routes to meet public health and safety needs. Under Alternatives B, C, D, [and E](#), public safety concerns could be reduced more than under Alternative A, which limits improvements to the routes listed in the 2000 Monument Management Plan (BLM 2000, TRAN-7).



Under all alternatives, the BLM's management decisions could impact environmental justice communities who rely on wood harvesting for heating sources or other uses. Under Alternative D, BLM management decisions would limit noncommercial and commercial wood harvesting, which would be the most restrictive of the alternatives. This could disproportionately impact environmental justice communities by restricting access to products; however, reducing use of wood for heating sources could improve air quality for the surrounding community, including environmental justice populations. These impacts would be site specific and would depend on the location and concentration of the wood burning. Under all alternatives, the BLM would continue to coordinate and consult with tribes with ties to GSENM. Also, the BLM would implement mitigation measures that would reduce impacts on tribal communities, such as impacts on wood cutting resources, sustenance resources, and cultural and spiritual resources.

Under all alternatives, the BLM's management decisions would continue to support environmental justice communities through employment, public services, economic output, and nonmarket benefits and ecosystem services. Under Alternative D, there could be less economic contributions from recreation than the other alternatives, if the BLM management decisions lead to a reduction in visitors due to more restrictions on land use and access to products and resources, which could affect environmental justice populations. However, the jobs associated with recreation and tourism are often short-term or seasonal positions, which might have limited impact on overall income for local households. If there are fewer overall visitors under Alternative D, there could be a reduction in negative impacts on cultural resources, which would likely impact environmental justice populations. Under Alternatives B, C, D, and E, there could be an increase in nonmarket benefits associated with more protected lands, compared with Alternative A, which could be especially impactful to minority populations and Tribal Nations who use GSENM for spiritual and traditional uses. Overall, Alternative E would have similar if not identical impacts to environmental justice as Alternative C.

This page intentionally left blank.

---

# TABLE OF CONTENTS

Chapter

Page

---

|  |             |
|--|-------------|
| <b>EXECUTIVE SUMMARY</b> .....   | <b>ES-I</b> |
| <b>CHAPTER 1. INTRODUCTION</b> .....   | <b>1-I</b>  |
| 1.1 Introduction .....   | 1-1         |
| 1.2 Purpose of and Need for Action .....   | 1-1         |
| 1.3 Planning Area and Decision Area .....  | 1-3         |
| 1.4 Issues Considered.....   | 1-7         |
| 1.4.1 Issues Considered in this Environmental Impact Statement .....   | 1-7         |
| 1.4.2 Issues Considered but Not Analyzed Further .....   | 1-9         |
| 1.5 Regulatory Context.....  | 1-10        |
| 1.5.1 Relationship to BLM Regulations, Policies, and Plans.....  | 1-11        |
| 1.5.2 Other Federal, State, and Local Government, and Tribal Resource-<br>Related Plans.....                               | 1-11        |
| 1.6 Consistency with Local Land Use Plans .....  | 1-12        |
| 1.7 <a href="#">Summary of Key Changes from the Draft RMP/EIS</a> .....  | 1-12        |
| <b>CHAPTER 2. ALTERNATIVES</b> .....   | <b>2-I</b>  |
| 2.1 Summary Description of the Alternatives .....  | 2-1         |
| 2.1.1 <a href="#">Alternative A</a> .....  | 2-8         |
| 2.1.2 Alternative B.....   | 2-9         |
| 2.1.3 Alternative C .....  | 2-10        |
| 2.1.4 Alternative D .....  | 2-12        |
| 2.1.5 <a href="#">Alternative E (Proposed RMP)</a> .....   | 2-13        |
| 2.2 Alternatives Considered but Eliminated from Detailed Analysis .....  | 2-14        |
| 2.2.1 Discontinue Livestock Grazing from the Entirety of GSENM .....   | 2-14        |
| 2.2.2 Make the Entirety of GSENM Available for Livestock Grazing .....   | 2-15        |
| 2.2.3 <a href="#">Phase Out Grazing in All Areas Not Compatible with Protection of<br/>            GSENM Objects</a> ..... | 2-15        |
| 2.3 <a href="#">Development of the Proposed RMP</a> .....  | 2-15        |
| 2.4 Detailed Description of the Alternatives .....   | 2-16        |
| 2.4.1 How to Read Section 2.4.3 .....  | 2-16        |
| 2.4.2 Components Common to Alternatives B, C, and D and the Proposed<br>RMP.....   | 2-18        |
| 2.4.3 Alternatives Comparison.....   | 2-19        |
| <b>CHAPTER 3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES</b> .....  | <b>3-I</b>  |
| 3.1 Air Resources .....  | 3-2         |
| 3.1.1 Air Quality.....   | 3-2         |
| 3.1.2 Climate Change (Including Greenhouse Gases).....   | 3-9         |
| 3.2 Soil Resources .....   | 3-17        |
| 3.2.1 Affected Environment.....  | 3-17        |
| 3.2.2 Environmental Consequences .....   | 3-18        |
| 3.3 <a href="#">Vegetation, Including Special Status Plants</a> .....  | 3-29        |
| 3.3.1 Affected Environment.....  | 3-29        |
| 3.3.2 Environmental Consequences .....   | 3-32        |

|      |  |       |
|------|--|-------|
| 3.4  | Water Resources.....                               | 3-62  |
|      | 3.4.1 Affected Environment.....                    | 3-62  |
|      | 3.4.2 Environmental Consequences .....             | 3-66  |
| 3.5  | Noxious Weeds and Invasive, Nonnative Plants ..... | 3-90  |
|      | 3.5.1 Affected Environment.....                    | 3-90  |
|      | 3.5.2 Environmental Consequences .....             | 3-91  |
| 3.6  | Cultural Resources.....                            | 3-99  |
|      | 3.6.1 Affected Environment.....                    | 3-99  |
|      | 3.6.2 Environmental Consequences .....             | 3-100 |
| 3.7  | Tribal Interests .....                             | 3-111 |
|      | 3.7.1 Affected Environment.....                    | 3-111 |
|      | 3.7.2 Environmental Consequences .....             | 3-113 |
| 3.8  | Paleontological and Geological Resources .....     | 3-122 |
|      | 3.8.1 Affected Environment.....                    | 3-131 |
|      | 3.8.2 Environmental Consequences .....             | 3-132 |
| 3.9  | Fish and Wildlife.....                             | 3-145 |
|      | 3.9.1 Affected Environment.....                    | 3-146 |
|      | 3.9.2 Environmental Consequences .....             | 3-149 |
| 3.10 | Visual Resources .....                             | 3-170 |
|      | 3.10.1 Affected Environment.....                   | 3-170 |
|      | 3.10.2 Environmental Consequences .....            | 3-172 |
| 3.11 | Dark Night Skies.....                              | 3-178 |
|      | 3.11.1 Affected Environment.....                   | 3-178 |
|      | 3.11.2 Environmental Consequences .....            | 3-179 |
| 3.12 | Natural Soundscapes.....                           | 3-181 |
|      | 3.12.1 Affected Environment.....                   | 3-181 |
|      | 3.12.2 Environmental Consequences .....            | 3-182 |
| 3.13 | Fire and Fuels Management.....                     | 3-189 |
|      | 3.13.1 Affected Environment.....                   | 3-189 |
|      | 3.13.2 Environmental Consequences .....            | 3-189 |
| 3.14 | Lands with Wilderness Characteristics .....        | 3-208 |
|      | 3.14.1 Affected Environment.....                   | 3-208 |
|      | 3.14.2 Environmental Consequences .....            | 3-208 |
| 3.15 | Forestry and Woodland Products .....               | 3-213 |
|      | 3.15.1 Affected Environment.....                   | 3-213 |
|      | 3.15.2 Environmental Consequences .....            | 3-214 |
| 3.16 | Livestock Grazing .....                            | 3-218 |
|      | 3.16.1 Affected Environment.....                   | 3-219 |
|      | 3.16.2 Environmental Consequences .....            | 3-220 |
| 3.17 | Recreation .....                                   | 3-233 |
|      | 3.17.1 Affected Environment.....                   | 3-233 |
|      | 3.17.2 Environmental Consequences .....            | 3-236 |
| 3.18 | Travel Management.....                             | 3-247 |
|      | 3.18.1 Affected Environment.....                   | 3-247 |
|      | 3.18.2 Environmental Consequences .....            | 3-249 |
| 3.19 | Lands and Realty .....                             | 3-255 |
|      | 3.19.1 Affected Environment.....                   | 3-255 |
|      | 3.19.2 Environmental Consequences .....            | 3-255 |

|  |   |                       |
|--|---|-----------------------|
| 3.20   | Special Designations.....   | 3-261                 |
| 3.20.1   | Areas of Critical Environmental Concern, Research Natural Areas, and other Special <a href="#">Area</a> Designations..... | 3-261                 |
| 3.20.2   | National Trails.....  | 3-266                 |
| 3.20.3   | Scenic Routes.....  | 3-271                 |
| 3.20.4   | Mormon Pioneer National Heritage Area (Boulder Loop and Under the Rim Districts).....                                     | 3-275                 |
| 3.20.5   | Wild and Scenic Rivers.....   | 3-276                 |
| 3.20.6   | Wilderness Study Areas.....   | 3-279                 |
| 3.21   | Social and Economic Values.....   | 3-282                 |
| 3.21.1   | Affected Environment.....   | 3-282                 |
| 3.21.2   | Environmental Consequences.....   | 3-283                 |
| 3.22   | Environmental Justice.....  | 3-298                 |
| 3.22.1   | Affected Environment.....   | 3-298                 |
| 3.22.2   | Environmental Consequences.....   | 3-299                 |
| <b>CHAPTER 4. CONSULTATION AND COORDINATION.....</b> |   | <b>4-1</b>            |
| 4.1  | Introduction.....   | 4-1                   |
| 4.2  | Public Collaboration and Outreach.....  | 4-2                   |
| 4.2.1  | Scoping Process.....  | 4-2                   |
| 4.3  | Consultation and Coordination.....  | 4-3                   |
| 4.3.1  | Cooperating Agencies.....   | 4-3                   |
| 4.3.2  | Tribal Nations.....   | 4-3                   |
| 4.3.3  | Additional Consultation.....  | 4-5                   |
| 4.3.4  | <a href="#">Dingell Act Compliance</a> .....  | 4-7                   |
| 4.4  | Monument Advisory Committee and Resource Advisory Council.....  | 4-7                   |
| 4.5  | List of Preparers.....  | 4-8                   |
| <b>REFERENCES.....</b>                               |   | <b>REFERENCES - I</b> |
| <b>GLOSSARY.....</b>                                 |   | <b>GLOSSARY-I</b>     |
| <b>INDEX.....</b>                                    |   | <b>INDEX-I</b>        |

| <b>TABLES</b> |  | Page |
|---------------|--|------|
| 1-1           | Surface Ownership in the Planning Area.....  | 1-5  |
| 2-1           | <a href="#">Quantifiable</a> Summary of the Alternatives.....  | 2-2  |
| 3-1           | Annual Air Pollutant Emissions by Source (tons per year).....  | 3-5  |
| 3-2           | Annual Greenhouse Gas Emissions by Source (metric tonnes per year).....  | 3-10 |
| 3-3           | SC-GHG Associated with Estimated Emissions from BLM Activities under Alternative A.....                        | 3-16 |
| 3-4           | SC-GHG Associated with Estimated Emissions from Other BLM Activities under Alternative B.....                  | 3-16 |
| 3-5           | SC-GHG Associated with Estimated Emissions from Other BLM Activities under Alternative C.....                  | 3-16 |
| 3-6           | SC-GHG Associated with Estimated Emissions from Other BLM Activities under Alternative D.....                  | 3-17 |
| 3-7           | <a href="#">SC-GHG Associated with Estimated Emissions from Other BLM Activities under Alternative E</a> ..... | 3-17 |

3-8 LANDFIRE Existing Vegetation Types in the Decision Area .....3-30

3-9 Ecological Site Groups in the Decision Area .....3-30

3-10 Ecological Site Groups Unavailable for Livestock Grazing under Alternative A .....3-40

3-11 Ecological Site Groups in Travel Management Areas under Alternative A .....3-41

3-12 Ecological Site Groups in Recreation Management Areas under Alternative A .....3-42

3-13 Ecological Site Groups in Right-of-Way Allocations under Alternative A .....3-43

3-14 Ecological Site Groups Unavailable for Livestock Grazing under Alternatives B and C .....3-45

3-15 Ecological Site Groups in Travel Management Areas under Alternative B .....3-46

3-16 Ecological Site Groups in Recreation Management Areas under Alternative B .....3-47

3-17 Ecological Site Groups in Right-of-way Allocations under Alternative B .....3-48

3-18 Ecological Site Groups in Travel Management Areas under Alternative C .....3-50

3-19 Ecological Site Groups in Recreation Management Areas under Alternative C .....3-51

3-20 Ecological Site Groups in Right-of-way Allocations under Alternative C .....3-52

3-21 Ecological Site Groups Unavailable for Livestock Grazing under Alternative D .....3-54

3-22 Ecological Site Groups in Travel Management Areas under Alternative D .....3-55

3-23 Ecological Site Groups in Recreation Management Areas under Alternative D .....3-56

3-24 Ecological Site Groups in Right-of-way Allocations under Alternative D .....3-57

3-25 Ecological Site Groups Unavailable for Livestock Grazing under Alternative E .....3-58

3-26 Ecological Site Groups in Travel Management Areas under Alternative E .....3-58

3-27 Ecological Site Groups in ROW Allocations under Alternative E .....3-60

3-28 GSENM Hydrologic Unit Code 10 Watersheds .....3-62

3-29 Lotic AIM Indicators Evaluated .....3-64

3-30 Utah List of Assessment Units in the Planning Area for Reporting Year 2022 .....3-65

3-31 Watersheds and Associated Acreage of Livestock Management Allocations by  
Alternative .....3-71

3-32 Watersheds and Associated Acreage of Rights-of-Way Management by Alternative .....3-74

3-33 Watersheds and Associated Acreage of Travel Management Allocations by Alternative .....3-77

3-34 Watersheds and Associated Acreage of Management Areas .....3-83

3-35 Noxious Weeds in the Planning Area .....3-90

3-36 Cultural Resources in the Decision Area by National Register Status ..... 3-100

3-37 Cultural Resources Predictive Model Classification Acreage in the Planning Area ..... 3-100

3-38 Numbers of Cultural Resources in Right-of-way, Off-highway Vehicle, Recreation, and  
Grazing Management Areas by Alternative ..... 3-103

3-39 Cultural Resources High-Probability Acreage in Right-of-way, Off-highway Vehicle,  
Recreation, and Grazing Management Areas by Alternative ..... 3-104

3-40 Numbers of Cultural Resources in Lands with Wilderness Characteristics and Areas of  
Critical Environmental Concern by Alternative ..... 3-105

3-41 Cultural Resources High-Probability Acreage in Lands with Wilderness Characteristics,  
Area of Critical Environmental Concern, and Research Natural Area Management  
Areas by Alternative ..... 3-106

3-42 Current Management and Activities that Could Impact Locations and Resources  
Important to Tribes ..... 3-112

3-43 Paleontological Potential and Summary of Paleontological and Geological Sources of  
the Geologic Units Mapped within the Decision Area ..... 3-124

3-44 Acres of Potential Fossil Yield Classification within the Decision Area ..... 3-131

3-45 Birds of Conservation Concern That Have the Potential to Occur in GSENM ..... 3-146

3-46 Acres of Mule Deer Habitat within GSENM ..... 3-146

3-47 Acres of Elk Habitat within GSENM ..... 3-147

3-48 Federally Listed Species that Have the Potential to Occur in GSENM ..... 3-147

3-49 BLM Sensitive Species Documented in or Potentially Occurring in the Decision Area ..... 3-147

|      |   |       |
|------|---|-------|
| 3-50 | BLM Visual Resource Inventory Classes with Visual Resource Inventory Class I .....  | 3-171 |
| 3-51 | BLM Visual Resource Inventory Classes without Visual Resource Inventory Class I .....   | 3-171 |
| 3-52 | BLM Visual Resource Inventory Scenic Quality .....  | 3-171 |
| 3-53 | BLM Visual Resource Inventory Sensitivity Levels .....  | 3-171 |
| 3-54 | BLM Visual Resource Inventory Distance Zones .....  | 3-171 |
| 3-55 | Current Visual Resource Management Classes .....  | 3-172 |
| 3-56 | Summary of Scenic Quality Classes and Proposed Visual Resource Management Class<br>by Alternative .....   | 3-172 |
| 3-57 | Baseline Night Sky Quality Reading Locations – Existing Sky Luminance .....   | 3-178 |
| 3-58 | Existing Light Pollution (Ratio of Artificial Sky Brightness to Natural Sky Brightness) .....   | 3-179 |
| 3-59 | Existing Modeled L50 Sound Levels (A-weighted Decibels [dBA]) .....   | 3-181 |
| 3-60 | Baseline Acoustic Monitoring Locations – Existing L50 Sound Levels (A-weighted<br>Decibels) .....   | 3-181 |
| 3-61 | Existing Modeled L50 Sound Levels (A-weighted Decibels) and Areas Where Different<br>Noise-Producing Facilities are Prohibited by Alternative ..... | 3-183 |
| 3-62 | Vegetation Condition Classes in Lands with Wilderness Characteristics .....   | 3-192 |
| 3-63 | Vegetation Condition Classes in Right-of-way Allocations .....  | 3-194 |
| 3-64 | Vegetation Condition Classes in Wilderness Study Areas and Instant Study Areas .....  | 3-196 |
| 3-65 | Vegetation Condition Classes in Recreation Management Areas .....   | 3-197 |
| 3-66 | Livestock Grazing Availability and AUM Allocations by Alternative .....   | 3-224 |
| 3-67 | Acres Available for Livestock Grazing within Lands with Wilderness Characteristics .....  | 3-225 |
| 3-68 | Current Day Use Sites and Trailheads by Unit .....  | 3-235 |
| 3-69 | Special Recreation Permits .....  | 3-236 |
| 3-70 | ACECs, RNAs (ACECs), and other Special Area Designations – Alternative A .....  | 3-263 |
| 3-71 | ACECs, RNAs (ACECs), and other Special Area Designations – Alternative B, C, and E .....  | 3-264 |
| 3-72 | ACECs, RNAs (ACECs), and other Special Area Designations – Alternative D .....  | 3-265 |
| 3-73 | Designated Scenic Routes included in All Alternatives .....   | 3-273 |
| 3-74 | Foreground/Middle ground Acreages for Alternatives B, C, E .....  | 3-274 |
| 3-75 | Foreground/Middle ground Acreages for Alternative D .....   | 3-274 |
| 3-76 | Suitable Wild and Scenic River Segments .....   | 3-276 |
| 3-77 | Suitable Wild and Scenic River Segment Changes under Alternative B .....  | 3-278 |
| 3-78 | Wilderness Study Areas and Instant Study Areas .....  | 3-279 |
| 3-79 | Estimated Number of Visitors by Visit Type in GSENM under Alternative A (2022) .....  | 3-284 |
| 3-80 | Spending Profile per Party by Visit Type (2022\$) .....   | 3-284 |
| 3-81 | Value of Production for Grazing .....   | 3-285 |
| 3-82 | Number of Permitted, Billed, Available, and Projected Billed AUMs .....   | 3-285 |
| 3-83 | Estimates of the Average Consumer Surplus of Recreational Benefits for the<br>Intermountain Region, per Person per Primary Activity Day .....       | 3-287 |
| 3-84 | Ecosystem Goods and Services in the Analysis Area, by Benefit .....   | 3-288 |
| 3-85 | Economic Contributions for Recreation from estimated Visitation under Alternative A<br>(2023\$) .....   | 3-289 |
| 3-86 | Economic Contributions for Grazing under Alternative A (2023\$) .....   | 3-290 |
| 3-87 | Economic Contributions for Grazing under Alternative B (2023\$) .....   | 3-291 |
| 3-88 | Economic Contributions for Grazing under Alternative C (2023\$) .....   | 3-293 |
| 3-89 | Economic Contributions for Grazing under Alternative D (2023\$) .....   | 3-295 |
| 3-90 | Economic Contributions for Grazing under Alternative E (2023\$) .....   | 3-296 |
| 3-91 | Environmental Justice Screening for Environmental Justice Analysis Area (2021) .....  | 3-299 |

|     |  |     |
|-----|--|-----|
| 4-1 | Consultation, Coordination, and Public Involvement Meetings Held for the GSENM RMP/EIS ..... | 4-1 |
| 4-2 | Cooperating Agencies for the GSENM RMP/EIS Planning Process .....                            | 4-3 |
| 4-3 | List of Preparers for the GSENM RMP/EIS.....   | 4-8 |

---

**FIGURE** (see Appendix A for additional figures) Page

---

|     |                                   |     |
|-----|-----------------------------------|-----|
| 1-1 | Planning and Decision Areas ..... | 1-6 |
|-----|-----------------------------------|-----|

---

**DIAGRAM** Page

---

|     |   |      |
|-----|---|------|
| 2-1 | How to Read the Alternatives Matrix ..... | 2-17 |
|-----|---|------|

---

**APPENDIXES**

---

|   |  |
|---|--|
| A | Figures  |
| B | AIM Analysis Technical Support Document  |
| C | <a href="#">Best Management Practices</a>  |
| D | Cultural Resources   |
| E | Recreation Management Areas  |
| F | Analytical Framework   |
| G | Inchworm Arch Road Interdisciplinary Route Evaluation Form and Analysis                          |
| H | Evaluation of Nominated Areas of Critical Environmental Concern and Research Natural Areas       |
| I | <a href="#">Affected Environment</a>   |
| J | <a href="#">Draft EIS Public Involvement and Comment Response</a>                                |
| K | Monitoring Plan  |
| L | Emissions Inventory  |
| M | Proposed RMP Trailing Pastures   |
| N | <a href="#">Old Spanish National Historic Trail Inventory, Assessment, and Monitoring Report</a> |
| O | <a href="#">Consistency with State and Local Land Use Plans</a>                                  |



## ACRONYMS AND ABBREVIATIONS

| Acronym or Abbreviation | Full Phrase   |
|-------------------------|---|
| ACEC                    | area of critical environmental concern                              |
| AFG                     | annual forb and grass   |
| AIM                     | Assessment, Inventory, and Monitoring                               |
| AMS                     | analysis of the management situation                                |
| ATV                     | all-terrain vehicle   |
| AUM                     | animal unit month   |
| BLM                     | United States Department of the Interior, Bureau of Land Management |
| BMP                     | best management practice  |
| °C                      | degrees Celsius   |
| CEQ                     | Council on Environmental Quality                                    |
| CFR                     | Code of Federal Regulations   |
| CO <sub>2</sub> e       | carbon dioxide equivalent   |
| dBA                     | A-weighted decibel  |
| DWQ                     | Utah Division of Water Quality                                      |
| EIS                     | environmental impact statement                                      |
| EPA                     | United States Environmental Protection Agency                       |
| ERMA                    | extensive recreation management area                                |
| ESA                     | Endangered Species Act of 1973                                      |
| °F                      | degrees Fahrenheit  |
| FLPMA                   | Federal Land Policy and Management Act of 1976                      |
| Forest Service          | United States Department of Agriculture, Forest Service             |
| FRG                     | fire regime group   |
| GHG                     | greenhouse gas  |
| GIS                     | geographical information system                                     |
| Glen Canyon             | Glen Canyon National Recreation Area                                |
| GSENM                   | Grand Staircase-Escalante National Monument                         |
| HAP                     | hazardous air pollutant   |
| HM                      | head month  |
| HUC                     | hydrologic unit code  |
| IMPLAN                  | Impact Analysis for Planning Model                                  |
| IPCC                    | Intergovernmental Panel on Climate Change                           |
| ISA                     | instant study area  |
| IWG                     | Interagency Working Group on the Social Cost of Greenhouse Gases    |
| KEPA                    | Kanab-Escalante planning area                                       |
| KFO                     | Kanab Field Office  |
| MAC                     | monument advisory committee   |
| MMP                     | monument management plan  |
| NAAQS                   | National Ambient Air Quality Standards                              |
| National Register       | National Register of Historic Places                                |

|                      |   |
|----------------------|---|
| NEPA                 | National Environmental Policy Act of 1969                                       |
| NLCS                 | National Landscape Conservation System  |
| NPS                  | United States Department of the Interior, National Park Service                 |
| <a href="#">NRA</a>  | <a href="#">National Recreation Area</a>  |
| NRCS                 | United States Department of Agriculture, Natural Resources Conservation Service |
| OHV                  | off-highway vehicle   |
| ONA                  | outstanding natural area  |
| ORV                  | outstandingly remarkable value  |
| OSNHT                | Old Spanish National Historic Trail   |
| PFC                  | proper functioning condition  |
| <a href="#">PFG</a>  | <a href="#">perennial forb and grass</a>  |
| PFYC                 | potential fossil yield classification   |
| PM <sub>2.5</sub>    | particulate matter less than 2.5 microns in diameter                            |
| PM <sub>10</sub>     | particulate matter less than 10 microns in diameter                             |
| RMA                  | recreation management area  |
| RMP                  | resource management plan  |
| RMZ                  | recreation management zone  |
| RNA                  | research natural area   |
| ROD                  | record of decision  |
| ROW                  | right-of-way  |
| R.S. 2477            | Revised Statute 2477 Act of July 28, 1866                                       |
| SC-GHG               | social cost of greenhouse gases   |
| SDSR                 | Site Degradation Susceptibility Rating  |
| <a href="#">SHPO</a> | <a href="#">State Historic Preservation Office</a>                              |
| SRMA                 | special recreation management area  |
| SRP                  | special recreation permit   |
| TDS                  | total dissolved solids  |
| TMDL                 | total maximum daily load  |
| TMP                  | travel management plan  |
| <a href="#">UAS</a>  | <a href="#">unmanned aircraft systems</a>                                       |
| UDEQ                 | Utah Department of Environmental Quality  |
| UDWQ                 | Utah Department of Environmental Quality, Division of Water Quality             |
| UDWR                 | Utah Division of Wildlife Resources   |
| U.S.                 | United States   |
| USC                  | United States Code  |
| USFWS                | United States Department of the Interior, Fish and Wildlife Service             |
| <a href="#">USGS</a> | <a href="#">United States Geological Survey</a>                                 |
| UTV                  | utility-task vehicle  |
| VCC                  | vegetation condition class  |
| VOC                  | volatile organic compound   |
| VRI                  | visual resource inventory   |
| VRM                  | visual resource management  |
| WSA                  | wilderness study area   |
| WSR                  | wild and scenic river   |

# Chapter I. Introduction

## I.1 INTRODUCTION

On October 8, 2021, Presidential Proclamation 10286 restored the boundaries and management conditions of Grand Staircase-Escalante National Monument (GSENM) to those that were in place prior to Presidential Proclamation 9682, which reduced the size of GSENM and divided it into three units. The purpose of Proclamation 10286 is to “ensure that the exceptional and inimitable landscape of GSENM, filled with an unparalleled diversity of resources, will be properly protected and will continue to provide the living laboratory that has produced so many dramatic discoveries in the first quarter century of its existence.”

Proclamation 10286 directs the Secretary of the Interior, acting through the United States (U.S.) Department of the Interior, Bureau of Land Management (BLM), to create a new management plan for the entirety of GSENM. A resource management plan (RMP) is the principal instrument the BLM uses to guide management of public lands and resources within its jurisdiction.

The Federal Land Policy and Management Act of 1976 (FLPMA) establishes the policy of the United States concerning the management of federally owned land managed by the BLM. The BLM “shall manage the public lands under principles of multiple use and sustained yield ... except that where a tract of such public land has been dedicated to specific uses according to any other provisions of law it shall be managed in accordance with such law” (43 United States Code [USC] 1732(a)). Proclamation 10286—in accordance with the Antiquities Act of 1906—dedicated the lands in GSENM to specific uses by designating the national monument and reserving the entirety of the lands in the restored boundary of GSENM as the smallest area compatible with the protection of its objects.

Proclamation 10286 also directed that GSENM shall be managed as part of the National Landscape Conservation System (NLCS), which was established “to conserve, protect, and restore nationally significant landscapes that have outstanding cultural, ecological, and scientific values for the benefit of current and future generations” (Congress.gov 2008). Therefore, the BLM is required to manage GSENM “in a manner that protects the values for which the components of the system were designated” (16 USC 7202). This management mandate may be realized in various ways. The GSENM RMP must reflect the unique issues, management concerns, and resource conditions of the management area while reflecting the purposes set forth in Proclamation 10286.

The BLM Paria River District Office has prepared this Proposed RMP/Final [Environmental Impact Statement \(Final EIS\)](#) pursuant to the BLM’s regulation for resource management planning found in 43 Code of Federal Regulations (CFR) 1610 and the National Environmental Policy Act of 1969 (NEPA).

## I.2 PURPOSE OF AND NEED FOR ACTION

Purposes and needs serve to frame the identification of issues, alternatives development, and effects analyses. Proclamation 10286 directs the BLM to “prepare and maintain a new management plan for the entire monument” for the specific purposes of “protecting and restoring the objects identified [in Proclamation 10286] and in Proclamation 6920.”

The RMP's purpose (40 CFR 1502.13) is to provide a management framework, including goals, objectives, and management direction, to guide GSENM management consistent with the protection of GSENM objects and the management direction provided in Proclamations 10286 and 6920.

The following purposes are derived from Proclamations 10286 and 6920, or they have been identified by the BLM based on key GSENM management challenges.

**Protect GSENM's large, remote, rugged, and markedly impenetrable landscapes.** GSENM includes extraordinary dark night skies, natural soundscapes, and a rich mosaic of resources, including numerous objects of historic and scientific interest. The extensive area of unspoiled natural, roadless areas within GSENM is unique in the lower 48 states, and was part of the impetus for the establishment of the monument in 1996. The plan's primary purpose is to protect GSENM objects, including this area's value as a unique, unspoiled, and natural landscape and its use as an outdoor science laboratory. GSENM's immense scale and unspoiled naturalness serve as a foundation and provide the context for monument objects and other important resources within the boundary, including, but not limited to, the diversity of ecotypes; geological, cultural, and paleontological resources; vegetation; and wildlife.

Management will address anthropogenic—or human-caused—impacts and challenges. Increases in anthropogenic factors pose diverse challenges for resource preservation (for example, adverse vegetation and soil impacts, the loss of geological and cultural resources, the loss of the potential for human solitude, adverse effects on certain wildlife species, and increases in noise). Incremental and gradual degradation of resources over time, due to ongoing uses, can easily occur unnoticed.

**Emphasize GSENM as a living, outdoor laboratory.** GSENM focuses on science and provides for diverse and significant research and discovery related to varied resources and objects. Proclamation 6920, which originally designated GSENM in 1996, states, “[e]ven today, this unspoiled natural area remains a frontier, a quality that greatly enhances the value for scientific study.” Science is the foundational purpose of GSENM.

Through scientifically informed management, GSENM will sustainably provide for scientific pursuits. Given the intensification of human-caused changes in the world, undisturbed and unaltered natural landscapes on the geographic scale of GSENM are increasingly essential, rare, and hard to maintain. Accordingly, GSENM is equally important both for scientific understanding of the past and for understanding changes and trends that allow us to appropriately plan for and understand the future.

**Protect and/or restore GSENM's biological resources.** GSENM supports a range of ecotypes, as well as reference populations, across the landscape's substantial range of elevation and large geographic extent. Due to the remoteness and substantial variation in elevation and topography, GSENM contains five life zones, a variety of habitats, multiple ecoregions, unique and isolated plant communities, and a diversity of invertebrates, birds, reptiles, and mammals.

The BLM will manage species within interconnected communities and ecosystems. Climate change and drought are pushing ecological conditions outside the historical range of variability, affecting the function and resilience of vegetation and, in turn, habitats and species. Accordingly, ecotypes, vegetation communities, and habitats will be managed for resilience.

**Protect GSENM’s cultural and historic resources.** GSENM provides for scientific, tribal, and public uses cultural resources. Cultural resources are locations of human activity, occupation, or use that contain materials, structures, or landscapes that were used, built, or modified by people. Cultural resources include archaeological sites, buildings, structures, objects, districts, and locations associated with cultural practices or beliefs of contemporary communities, including Tribal Nations.

Discretionary uses, including livestock grazing and rising visitation levels, pose challenges for archaeological and historic resource protection and for tribal access and uses (for example, Tribal Nations with ties to GSENM have appropriate access to traditionally sacred places and landscapes). Management will provide for varied access and uses, while protecting cultural and historic resources.

**Protect GSENM’s geology, paleontology, and scenic landscapes.** GSENM landscapes contain unique geological resources, world-class paleontological resources, and extraordinary scenery. Scenic exploration can be accessed via paved and unpaved roads that serve as arteries through GSENM.

Geological and paleontological resources will be protected; they also will be appropriately available for scientific use and public enjoyment. Scientific uses require access and resource protection.

**Protect and/or restore opportunities to experience GSENM’s remote landscape and associated adventure and self-discovery.** While not identified as an object in need of protection, Proclamation 10286 acknowledges world-class recreational opportunities in GSENM. Most visitation to GSENM is recreational, and high and increasing levels of recreational visitation are a top management challenge. Large numbers of visitors can degrade the visitor experience, impede protection of GSENM objects, and impact other resources.

The BLM will protect GSENM’s objects in this remote, fragile landscape amid rapidly rising visitation levels. The BLM also will provide diverse recreational opportunities and basic facilities.

**Manage discretionary uses in GSENM in the context of protecting GSENM objects.** GSENM lands have long served a variety of uses and purposes for Tribal Nations, Anglo-American explorers, early Latter-day Saint pioneers, and the groups’ descendants. Since the designation of GSENM in 1996, there has been controversy regarding the BLM’s discretionary uses within the context of GSENM preservation mandates.

The BLM will manage discretionary uses to be consistent with the protection of GSENM’s objects.

### **I.3 PLANNING AREA AND DECISION AREA**

GSENM was established to protect one of the last large-scale, unspoiled natural landscapes in the lower 48 states, including for the purposes of scientific investigations. Utah has long contained extensive roadless and previously unmapped areas, although that is changing due to exceptional rises in both visitation and the residential population. GSENM is adjacent to remote rural communities, agricultural and range lands, and various federal, state, and county lands. GSENM contains diverse geological features, including a sequence of unique sedimentary rock layers that extends from the central part of GSENM to its southern boundary; this sequence of layers is known as “the Grand Staircase.” Other broadscale landscape features of GSENM include the Escalante Canyons in the northeast portion of GSENM; the Paria River Canyon and associated tributaries that bisect GSENM from north to south; and the Kaiparowits Plateau, a largely roadless area that comprises much of the central region of GSENM containing a variety of terrain, such

as steep walled canyons, escarpments, towers, arches, and a series of benches, with vegetation ranging from ponderosa pine forests, pinyon and juniper woodlands, and aspen groves on Fiftymile Mountain to sparse desert shrub and grasslands on Nipple Bench.

The scenic values of GSENM are rare and outstanding, attracting large and growing numbers of recreationists and international visitors. GSENM also contains diverse, extensive, and rare biotic, paleontological, and archaeological resources. GSENM includes areas that:

- Support hydrologic research and management due to inclusion of three nearly complete watersheds that descend from the forests of the Aquarius Plateau and Boulder Mountain to pinyon-juniper woodlands, and finally to warm-temperate desert shrublands at the southeastern edges of GSENM near Glen Canyon National Recreation Area (Glen Canyon).
- Facilitate climate change understanding and enhancement of the potential for managing and studying landscape resilience; this is because GSENM contains a span of elevation and ecotypes. This span fosters observation of changes within, and possible species migrations across, diverse ecotypes.
- Contain one of the most floristically diverse regions in the Intermountain West. As a result of the blending of warm- and cold-desert flora, and the high number of species native to the landscape, an abundance of unique, isolated plant communities can be found, including half of Utah's rare flora and 125 species of plants unique to Utah and the Colorado Plateau.
- Contain an outstanding biodiversity of bees, including several endemic species, due, in part, to the area's substantial elevation gradient, diversity of habitats, and abundance of flowering plants.
- Contain paleontological resources, including globally critical Cretaceous-aged dinosaur resources that are accessible due to the excellent exposures of their host geological formations. Ongoing paleontological discoveries will continue to make invaluable contributions to understanding of the planet's past.
- Contain an outstanding density and diversity of archaeological and historic sites. Evidence of habitation by the Ancestral Pueblo and Fremont Cultures, as well as early European settlement, is found in abundance and provides insight into human interaction with this unique environment.

GSENM is near or adjacent to areas of national and international significance, including Bryce Canyon National Park; Zion National Park; Capitol Reef National Park; the North Rim of the Grand Canyon; Glen Canyon; Pipe Spring, Cedar Breaks, Grand Canyon-Parashant, Vermilion Cliffs, and [Baaj Nwaavjo I'tah Kukveni-Ancestral Footprints of the Grand Canyon National Monuments](#); Kodachrome Basin State Park; Escalante Petrified Forest State Park; and Coral Pink Sand Dunes State Park. Small communities are on GSENM's perimeter. Their economies are intertwined with livestock grazing and the recreational opportunities that exist both [within](#) GSENM and the surrounding areas of national and international significance, which draw local, national, and international visitors.

[Tribal Nations](#) with direct ties to the GSENM area include the [Hopi Tribe](#), the [Kaibab Band of Paiute Indians](#), the [Navajo Nation](#), the [Paiute Indian Tribe of Utah](#), the [San Juan Southern Paiute Tribe of Arizona](#), the [Pueblo of Acoma](#), the [Pueblo of San Felipe](#), the [Pueblo of Tesuque](#), and the [Pueblo of Zuni](#).

The BLM's Land Use Planning Handbook (H-1601-1) differentiates between geographic areas associated with planning. These areas include the planning area and decision area. The planning area is the region

within which the BLM will make decisions during a planning effort. A planning area boundary includes all lands regardless of jurisdiction; however, the BLM will only make decisions for the decision area, which is limited to lands managed by the BLM. For the purposes of this RMP/EIS, the planning area refers to the entire area outlined in **Figure I-1**. **Table I-1** details the surface ownership within the planning area.

**Table I-1. Surface Ownership in the Planning Area**

| <b>Surface Ownership</b>    | <b>Acres</b>     |
|-----------------------------|------------------|
| BLM (surface decision area) | 1,865,600        |
| Private                     | 14,800           |
| <b>Planning area total</b>  | <b>1,880,400</b> |

Source: BLM geographic information system (GIS) 2022

Of the approximately 1,880,400 acres of land within the planning area, the RMP/EIS will make decisions for approximately 1.87 million acres of public land managed by the BLM. This is known as the decision area. The decision area does not include state, municipal, or private lands. While this RMP/EIS analyzes management actions applicable to livestock grazing allotments [within the administrative boundaries of the U.S. Department of the Interior, National Park Service \(NPS\); the BLM Kanab Field Office \(KFO\); and the BLM Arizona Strip Field Office](#), these management actions will not be authorized by the subsequent [record of decision \(ROD\)](#) or included in the Approved RMP. [The respective agency and field office would make decisions associated with these management actions in subsequent decision documents. When the BLM administers grazing in Glen Canyon, the BLM will consult and cooperate with the NPS to ensure that grazing authorizations, range improvements, allotment management plans, management agreements, and resource monitoring and evaluation efforts do not conflict with the Glen Canyon’s enabling legislation, the NPS Organic Act, or the approved NPS general management plan for Glen Canyon.](#)

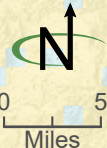
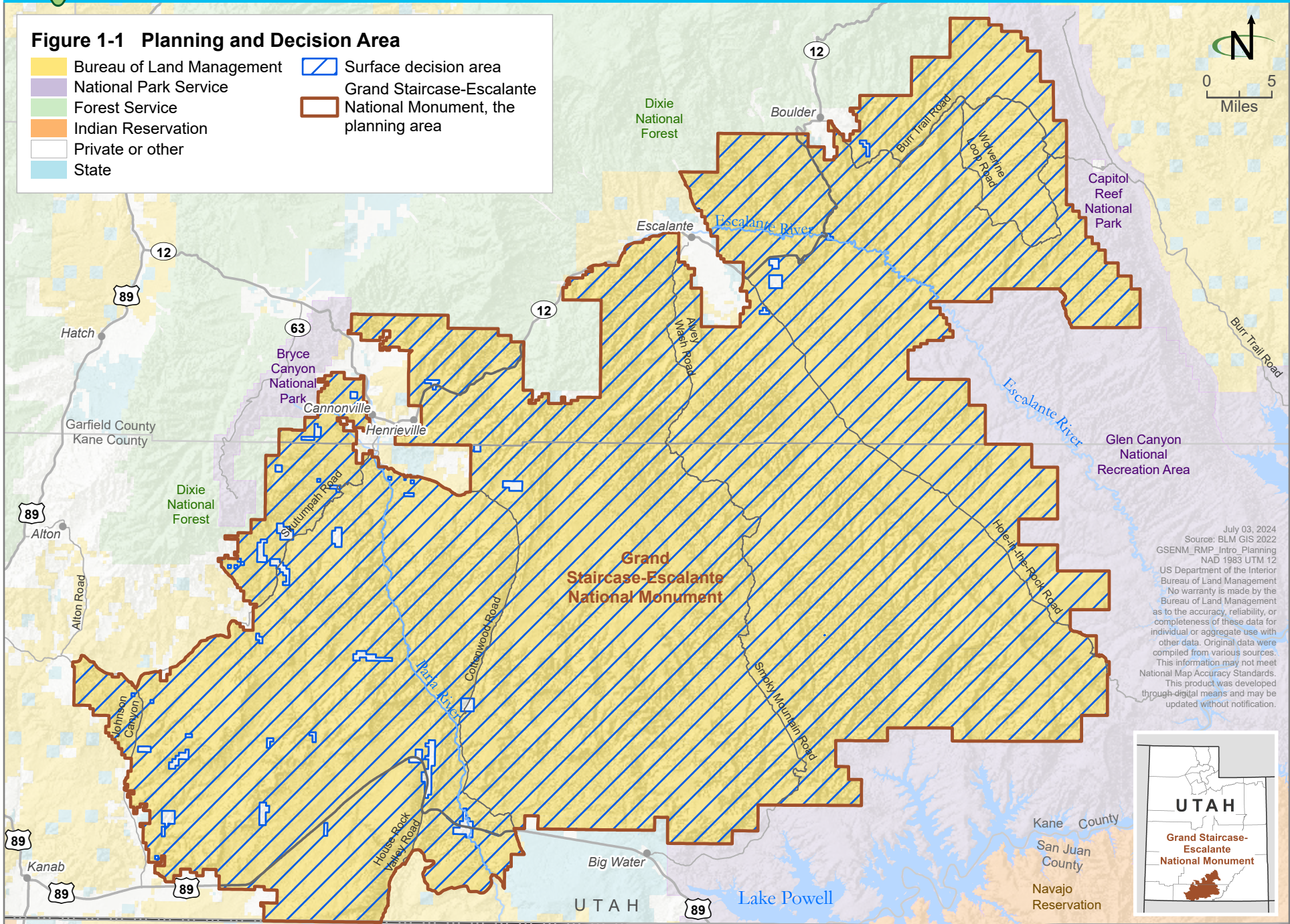
[The NPS manages grazing within the Glen Canyon boundary, and the BLM administers the program through a memorandum of understanding. Through the planning process, the NPS made a request of the BLM to analyze certain grazing allotments under different planning alternatives. This analysis allows the NPS and BLM to review and thoughtfully consider the potential impacts of altering management of NPS allotments. The ROD for this plan will have no authority to close any allotments for the NPS. The NPS will continue to conduct resource monitoring of land health for Glen Canyon and make determinations independent of this plan on behalf of the NPS-managed grazing allotments.](#)



# Grand Staircase-Escalante National Monument

### Figure 1-1 Planning and Decision Area

- Bureau of Land Management
- National Park Service
- Forest Service
- Indian Reservation
- Private or other
- State
- Surface decision area
- Grand Staircase-Escalante National Monument, the planning area



July 03, 2024  
 Source: BLM GIS 2022  
 GSENM\_RMP\_Intro\_Planning  
 NAD 1983 UTM 12  
 US Department of the Interior  
 Bureau of Land Management  
 No warranty is made by the  
 Bureau of Land Management  
 as to the accuracy, reliability, or  
 completeness of these data for  
 individual or aggregate use with  
 other data. Original data were  
 compiled from various sources.  
 This information may not meet  
 National Map Accuracy Standards.  
 This product was developed  
 through digital means and may be  
 updated without notification.





## **I.4 ISSUES CONSIDERED**

During the scoping process, the BLM received comments from members of the public and various public, governmental, and nongovernmental groups. This feedback has been compiled to describe issues and analysis concerns that are discussed in this document. During the scoping period, individual comments received were evaluated to determine whether they constituted issues relevant to this planning process. Issues are defined as concerns regarding the effects that the [alternatives have](#) on resources. Issues can drive the development of an alternative; they may involve resources that are adversely affected by the proposed action or involve unresolved conflicts regarding alternative uses of available resources. Planning issues provide focus for the analysis and are used to [compare](#) the environmental effects of the alternatives.

### **I.4.1 Issues Considered in this Environmental Impact Statement**

Relevant issues discussed in this EIS are as follows:

- How would proposed management actions and land use allocations contribute to air pollutant emissions and affect air quality and visibility?
- What would be the expected contribution to greenhouse gas (GHG) emissions from proposed management?
- How would proposed management affect long-term carbon storage and sequestration in GSENM?
- How would proposed management affect biological soil crusts?
- How would proposed management affect vulnerable soils?
- How would proposed management affect soil health and ecological function?
- How would existing and proposed land use allocations and discretionary uses affect terrestrial vegetation, including special status plant species?
- How would vegetation management and restoration approaches affect landscape-scale ecological functioning, terrestrial vegetation, and special status plant species?
- How would management decisions of activities that disturb soils and accelerate erosion affect water resources (groundwater, surface water, wetlands, riparian areas, floodplains, and water quality)?
- How would proposed management impact water quality (and water quality standards set by the State of Utah and the U.S. Environmental Protection Agency [EPA]) and protection of dependent resources?
- How would proposed vegetation management and land use allocations affect noxious and invasive, nonnative plants?
- How would proposed management impact historic properties?
- How would proposed management protect cultural resources, including cultural landscapes, traditional uses, and historic properties?
- How would proposed management ensure continued traditional uses of religious or cultural sites important to Tribal Nations and local communities?
- How would proposed management impact landscapes of religious or cultural importance to Tribal Nations and local communities?

- How would proposed management decisions regarding paleontological resource management (such as curation, protection, survey, collection, outreach, and interpretation) impact paleontological resources, research communities, local communities, and visitor experiences?
- How would land use allocations and discretionary uses impact paleontological resources?
- How would land use allocations and discretionary uses impact unique geological features?
- How would proposed management affect wildlife, fisheries, and special status species resources?
- How would proposed management affect inventoried visual values, including scenic quality, and the public's highly valued experience of enjoying scenery?
- How would proposed management actions affect dark night skies?
- How would proposed management affect natural quiet soundscapes?
- How would land use allocations and discretionary uses affect fire and fuels?
- How would vegetation management actions affect fire and fuels?
- How would proposed management affect the size; apparent naturalness; outstanding opportunities for solitude or primitive, unconfined recreation; and supplemental values of lands with wilderness characteristics?
- [How would vegetation management decisions affect woodland and forestry product harvest in the planning area?](#)
- How would proposed management impact livestock grazing and ranching operations under existing permits and leases?
- How would proposed management affect rangeland condition?
- How would proposed management affect the BLM's ability to provide recreational opportunities and infrastructure while protecting GSENM objects?
- How would proposed management affect the travel and transportation system in GSENM?
- How would proposed management affect land use authorizations and land tenure in the decision area?
- How would management affect the relevant and important values of potential areas of critical environmental concern (ACECs)?
- How would management affect the nature and purpose of the Old Spanish National Historic Trail (OSNHT)?
- How would management impact the viewshed surrounding scenic routes and the experience of enjoying scenic routes within the planning area?
- How would management impact the cultural, historic, and natural resources for which National Heritage Areas were designated?
- How would management affect the free-flowing condition, water quality, outstandingly remarkable values (ORVs), and tentative classification of river segments found suitable for inclusion in the National Wild and Scenic Rivers System?
- How would management actions affect the nonimpairment standard in of Wilderness Study Areas (WSAs)?
- How would BLM management actions impact local and regional economic interests and conditions?

- How would BLM management actions impact social conditions and values of communities?
- How would BLM management actions impact the environment, health, and livelihoods of communities with environmental justice concerns?

#### **I.4.2 Issues Considered but Not Analyzed Further**

The following issues were considered but are not being analyzed further for the reasons outlined:

- How would proposed management affect valid existing rights for minerals in the decision area? Proclamation 10286 appropriated and withdrew GSENM “from all forms of entry, location, selection, sale, or other disposition under the public land laws, from location, entry, and patent under the mining laws, and from disposition under all laws relating to mineral and geothermal leasing... subject to valid existing rights.” As a result, GSENM is closed to new oil and gas, geothermal, coal, and nonenergy solid minerals leasing and closed to new location of mining claims under the Mining Law of 1872. GSENM is also closed to mineral materials disposal (such as sand, gravel, and petrified wood) under 30 USC 601. Under the 2020 Approved RMP for the Kanab-Escalante Planning Area (KEPA), lands in the former KEPA were available for such uses, with stipulations or restrictions in areas to protect certain resources. Proclamation 10286 removed the discretion from the BLM Authorized Officer to make decisions related to these uses. As a result, the alternatives would not measurably impact mineral exploration and development within GSENM. In accordance with Proclamation 10286, the BLM will continue to recognize valid existing rights.
- How would proposed management affect public health and safety around abandoned mines in the decision area? The BLM typically closes abandoned mines as they are identified and as funding allows under the Abandoned Mine Lands Program. Proposed management would not measurably change public health and safety concerns related to abandoned mines in GSENM.
- How would proposed management affect land tenure in the decision area? Proclamation 10286 [withdrew](#) all BLM-managed land within GSENM from selection, sale, or other disposition under the public land laws, other than by exchange that furthers the protective purposes of GSENM. As such, the BLM has limited discretion over disposal. The BLM would acquire land only from willing sellers as opportunities arise. Therefore, the alternatives would not measurably impact land tenure in GSENM.
- How would proposed management impact wild horses? [There are no](#) wild horses are in the Moody-Wagon Box Mesa herd area, so there would be no impacts on wild horses in that location. Management related to wild horses would be the same across all alternatives, including Alternative A. A small number of wild horses remain in the Harvey’s Fear herd area (less than 25 as of 2016). However, due to its remote location, the herd does not have contact with other horses and is becoming genetically unviable. Proposed management is not directed at the herd area, and it would not impact the herd area, primarily due to the herd area’s remote location and dwindling population. See Section 5.21 of the Analysis of the Management Situation (AMS; <https://eplanning.blm.gov/eplanning-ui/project/2020343/570>) for more information on wild horses in GSENM.
- [How would proposed management affect administration of the GSENM science program? The GSENM science program follows applicable policies and is administrative in nature. Research proposed to take place in GSENM goes through an application and permitting process to determine the appropriateness of the proposal, including consideration of proposed methods and](#)

possible impacts on GSENM objects and resources. This is an administrative process during which the protection of GSENM objects is ensured and which prompts project-level environmental compliance and analysis (for example, NEPA analysis), if applicable. The analysis of alternatives in this Final EIS will inform the decision on the RMP; the GSENM science program will conform to this decision. However, the Final EIS alternatives related to the GSENM science program would not directly affect the human environment.

## I.5 REGULATORY CONTEXT

The foundations of public land management are derived from the mandates and authorities provided in laws and regulations. Executive orders, BLM policy guidance (for example, instruction memoranda, information bulletins, manuals, and handbooks), and other policy direction implement and interpret the authorities provided under those laws and regulations. The BLM's planning process, as described in 43 CFR 1600, is authorized by and implements the direction of a variety of federal laws, in particular FLPMA and NEPA.

The FLPMA provides that the BLM “shall manage the public lands under principles of multiple use and sustained yield ... except that where a tract of such public land has been dedicated to specific uses according to any other provisions of law it shall be managed in accordance with such law” (43 USC 1732(a)). Proclamation 10286 dedicates GSENM to specific uses, specifically the protection of objects of historic and scientific significance. Additionally, the Proclamation identifies GSENM as a component of the NLCS; therefore, the BLM is required to manage GSENM “in a manner that protects the values for which the components of the system were designated” (16 USC 7202). Accordingly, discretionary uses in GSENM must be consistent with Proclamation 10286, 16 USC 7202, and the BLM's approved land use plan.

In NEPA, Congress directs “all agencies of the Federal Government...[to]...utilize a systematic, interdisciplinary approach which will ensure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision making which may have an impact on man's environment” (42 USC 4332(A)). This Proposed RMP/Final EIS examine a range of alternatives, including Alternative A, to resolve the issues in question. Alternatives represent complete, but different, means of satisfying the identified purposes and needs of the EIS and of resolving the issues. The Proposed RMP/Final EIS use the best available information (see references). Other federal laws, regulations, and policies, as well as applicable state, local, and other applicable regulatory frameworks, are identified below.

The BLM develops land use plans through a planning and NEPA process that includes public involvement (43 USC 1712(a)). The FLPMA also directs the BLM to coordinate with other federal departments and agencies, state and local governments, and Tribal Nations to seek to promote consistency among land use plans across jurisdictions. The BLM has coordinated and collaborated with such entities throughout the RMP/EIS process.

**Chapter 3** of the AMS (<https://eplanning.blm.gov/eplanning-ui/project/2020343/570>) includes a list of relevant federal laws, as well as BLM plans, policies, and programs. Additional relevant laws, regulations, and policies are included below.

### **1.5.1 Relationship to BLM Regulations, Policies, and Plans**

The GSENM [Proposed](#) RMP will replace the 2020 GSENM RMPs and the 2020 KEPA RMP. It will also obviate the Interim Guidance issued on December 16, 2021, which informed BLM staff of how Proclamation 10286 fit into the existing legal framework that governs GSENM until the BLM completes a new management plan for GSENM.

### **1.5.2 Other Federal, State, and Local Government, and Tribal Resource-Related Plans**

#### **Federal Plans**

In general, these plans relate to this planning effort due to the proximity of the area managed in the plan and GSENM.

- Glen Canyon National Recreation Area Grazing Management Plan—Identifies goals and objectives for the natural and cultural resources with respect to livestock grazing in Glen Canyon.
- Bryce Canyon National Park Air Tour Management Plan—Protects tangible and intangible resources of Bryce Canyon, including natural sounds, wildlife, wilderness character, and visitor experiences of solitude and quiet as visitors are allowed reasonable opportunities to experience these landscapes from the air.
- Capitol Reef National Park General Management Plan—Directs natural and cultural resource management, visitor use, and general development.
- Capitol Reef National Park Livestock Grazing and Trailing Management Plan—Promotes the shared conservation and stewardship of the natural resources, ecological processes, and cultural resources of Capitol Reef National Park by providing guidance and tools to the NPS and permit holders for the long-term management of livestock grazing and trailing at the park.
- Bryce Canyon National Park International Dark Sky Park Application—Designates Bryce Canyon National Park as a Gold Tier International Dark Sky Park under the 2015 International Dark Sky Association Guidelines.
- Glen Canyon National Recreation Area Management Plan—Directs natural and cultural resource management, visitor use, and general development.
- Rainbow Bridge National Monument Commercial Air Tour Voluntary Agreement—Establishes conditions for commercial air tours over Rainbow Bridge National Monument.

#### **State Plans**

Relevant State of Utah regulations germane to the planning process can be found in Chapter 3 of the AMS (<https://eplanning.blm.gov/eplanning-ui/project/2020343/570>), with the following additions

- Utah Mule Deer Statewide Management Plan for 2019–2024
- Utah Division of Wildlife Resources (UDWR) Statewide Bighorn Management Plan 2018
- Implementation of Secretarial Order 3362 Utah Action Plan 2022
- Bighorn Sheep Unit Management Plan Kaiparowits Wildlife Management Unit #26 East/West/Escalante, August 2019
- Deer Herd Unit Management Plan #27 Paunsaugunt, 2020
- Utah Statewide Elk Management Plan, 2022

- Elk Management Plan – Greater Plateau Elk Complex – Elk units: 23 Monroe, and 24 Mt. Dutton, 25 A&B, Fish Lake/Thousand Lakes, 25C Boulder/Kaiparowits
- Utah Pronghorn Statewide Management Plan, 2017
- Utah Black Bear Management Plan 2023–2035
- Wild Turkey Management Plan 2014–2023

### **County Plans**

The planning area encompasses approximately 1,880,400 acres in portions of Kane and Garfield Counties. County plans, policies, and programs that may be germane to the planning effort process can be found in Chapter 3 of the AMS (<https://eplanning.blm.gov/eplanning-ui/project/2020343/570>).

### **Tribal Plans**

No tribal plans have been identified.

## **I.6 CONSISTENCY WITH LOCAL LAND USE PLANS**

FLPMA, Title II, Section 202, [directs](#) the BLM to coordinate planning efforts with Native American Indian tribes, other federal departments, and agencies of the state and local governments. To accomplish this directive, the BLM [must](#) keep apprised of state, local, and tribal plans; assure that consideration is given to such plans; and assist in resolving inconsistencies between such plans and federal planning. The section goes on to state in Subsection (c)(9) that, “Land use plans of the Secretary [of the Interior] under this section shall be consistent with state and local plans to the maximum extent he finds consistent with federal law and the purposes of this Act.” The provisions of this section of FLPMA are echoed in Section 1610.3 of the BLM Resource Management Planning regulations. [Appendix O includes a review of applicable state and local land use plans, and describes the consistency considerations relevant to the Proposed RMP/Final EIS.](#)

In keeping with the provisions of this section, the BLM established regular opportunities for interaction with state, local, and tribal officials. State, county, and municipal officials have participated in regular informational meetings. [In addition to the BLM-scheduled cooperating agency meetings, the BLM also participated in coordination meetings requested by Kane and Garfield Counties.](#)

[In accordance with](#) Section 1610.4-7 of the BLM Resource Management Planning regulations, the BLM [provided the](#) Draft RMP/EIS to the governor, other federal agencies, state and local governments, and Native American tribes for comment. The resulting comments [are](#) addressed in the Proposed RMP/Final EIS. The formal 60-day consistency review by the governor will occur after the Proposed RMP/Final EIS is published, as outlined in 1610.3-2(e) of the BLM planning regulations.

## **I.7 SUMMARY OF KEY CHANGES FROM THE DRAFT RMP/EIS**

[Blue-colored text through the Proposed RMP/Final EIS indicates changes that the BLM made between the draft and final versions of the RMP/EIS, including alternative matrix text that has been moved. The BLM made changes to the Proposed RMP/Final EIS based on public comments received on the Draft RMP/EIS and input from cooperating agencies, Tribal Nations, and the BLM interdisciplinary team. The BLM also made revisions for consistency, clarity, and accuracy, and to provide additional context for the existing](#)

analysis. The primary changes in the Proposed RMP/Final EIS compared with the Draft RMP/EIS are summarized below:

- The Proposed RMP/Final EIS described and analyzed the impacts associated with the new Alternative E, which is the Proposed RMP. The BLM developed Alternative E through revisions to Alternative C, which was the agency's preferred alternative. The BLM made the revisions through consideration of public comments, input from cooperating agencies and Tribal Nations, and the use of updated best available science and information. Alternative E is within the range of alternatives considered in the Draft RMP/EIS.
- The Proposed RMP was added to the description of alternatives in **Chapter 2** as Alternative E, and analysis of Alternative E was added to the discussion in the environmental consequences sections of each resource topic in **Chapter 3**.
- Updates from revised management direction allocations or corrected acreage calculations were made to **Table 2-1** in **Chapter 2**, including for management areas under Alternative C, visual resource management classifications under Alternative B, livestock grazing under all alternatives, recreational management areas under all alternatives, recreational shooting under Alternatives B and C, off-highway vehicle (OHV) area allocations under Alternative C, OHV route allocations and routes claimed under Revised Statute (R.S.) 2477 under all alternatives, rights-of-way (ROWs) and designated corridors under all alternatives, research natural areas (RNAs) (ACECs) under all alternatives, wild and scenic river (WSR) mileage under all alternatives, and WSA acreage under all alternatives.
- Language was added to the descriptions of the alternatives in **Chapter 2** and the travel management sections of **Chapter 3**, **Appendix I**, and **Appendix F** for the mileage of routes claimed under R.S. 2477 that are in OHV allocation areas under each alternative.
- Language was added in **Chapter 2** and **Chapter 3** to clarify the process of considering livestock grazing on allotments administered by the BLM but managed by the NPS in Glen Canyon; the analysis of those allotments changed from unavailable in the Draft EIS to available in the Final EIS under Alternatives C and D. Language was also added to specify where calculations of livestock grazing allocations are for the larger grazing planning area inclusive of the Glen Canyon allotments, where they are for just the GSENM Proposed RMP decision area for the purpose of comparative analysis in **Chapter 3**.
- The BLM used updated assessment, inventory, and monitoring (AIM) data to revise the list of departed watersheds, which now include seven hydrologic unit code (HUC)-10 waters and two HUC-12 sub-watersheds. The updated data were also used to revise the list of grazing allotments analyzed as unavailable under Alternative D in **Chapter 2**. A discussion of the new data and the data's application to grazing allotments was added to **Appendix B**. The updated list of departed watersheds was also applied to management direction for soil resources, vegetation, water resources, and livestock grazing; the management direction prioritizes areas for land health assessments under Alternatives B and C in **Chapter 2**.
- The alternatives comparison in **Section 2.4.3** in **Chapter 2** was revised to not only include Alternative E and the updated departed watersheds, but also:
  - Management areas (front country, passage, outback, and primitive areas) were added to **Section 2.4.3** under Alternatives C and E, and the management area allocation calculations were corrected.

- The BLM revised management direction for soil resources pertaining to exceptions to the avoidance of soil-disturbing discretionary actions under Alternatives B, C, and D.
- The BLM removed the management direction for soil resources that was previously on row 24 of **Section 2.4.3** under Alternative A; the direction had said, “No similar management direction.”
- The BLM moved the management direction regarding the collection and removal of residues under Alternatives B, C, and D from forestry and woodland products to vegetation.
- Management direction for water resources for non-recreational water developments was revised under Alternatives B, C, and D.
- Management direction for tribal stewardship was revised to more accurately name the Tribal Nation co-stewardship plan under Alternatives B, C, and D.
- The BLM revised the calculations for the visual resource management (VRM) classification allocations for Alternatives B, C, and D.
- The BLM corrected the calculations for lands with wilderness characteristics allocation acreages under Alternative C to correct a GIS calculation error in the Draft EIS.
- Allocations of allotments unavailable for livestock grazing were revised under Alternative C to no longer include those allotments or portions of allotments within Glen Canyon.
- The BLM revised calculations for allocation acreages for areas available for livestock grazing under Alternatives A, B, C, and D.
- The BLM revised the calculations for allocation acreages for livestock grazing animal unit months (AUMs) under Alternatives C and D.
- Management direction for recreation and visitor services regarding the issuance of permits was revised under Alternatives B, C, and D.
- Management direction for travel and transportation management was revised to include updated travel management areas under Alternatives B, C, and D.
- Management direction for travel and transportation management was updated to include corrected OHV open, limited, and closed acreage calculations under Alternatives A, B, C, and D.
- Allocations for lands and realty avoidance areas were revised to include greater sage-grouse areas and to add correct references under Alternatives B, C, and D.
- The BLM updated the management direction for lands and realty on land acquisition priorities under Alternatives B, C, and D.
- Management direction for special area designations was revised for clarity of terms under Alternative A.
- Management direction for WSRs was revised to include the management corridors within lands with wilderness characteristics in the primitive area as VRM Class I under Alternatives B, C, and D.
- Additional context concerning the affected environment sections in **Chapter 3** was moved to **Appendix I**.
- The BLM continued to supplement ACEC and RNA (ACEC) nomination evaluations through ongoing internal assessments by an interdisciplinary team, fieldwork, and information from the Draft EIS scoping period. This has ensured the BLM’s ACEC and RNA (ACEC) evaluations align



with the intents of the ACEC and RNA (ACEC) designation (BLM Manual 1613, Areas of Critical Environmental Concern). As a result, evaluations have been augmented. Two RNAs (ACECs) are proposed for designation. **Appendix H** provides the results of all nomination evaluations and the associated rationale.

- Public comment on the Draft EIS and content on the BLM's response were developed and added as **Appendix J**.
- Past, present, and reasonably foreseeable future actions were updated in **Appendix F**.
- A monitoring plan was developed and included as **Appendix K**.
- A final emissions inventory was completed and included as **Appendix L**. The BLM used the updated data from the inventory to revise the air quality analysis in **Chapter 3**.
- Due to public comments with new data and requests to make multiple pastures unavailable to grazing to protect GSENM objects, the BLM allocated four pastures as unavailable for grazing, but still allowed active trailing. The pastures are all within allotments within the departed watersheds, as described in the revised **Appendix B**. **Appendix M** was also developed and included in the Final EIS to provide additional details about resource conditions in each pasture; these details informed the decision to close the pastures.
- The OSNHT Corridor Inventory Project was completed and used to revise the OSNHT management corridor and associated management direction in the Proposed RMP/Final EIS, including new goals, objectives, and management direction under Alternative E in **Chapter 2**. The Inventory, Assessment, and Monitoring Report has been added as **Appendix N**.
- A review of applicable state and local land use plans and a description of the consistency considerations relevant to the Proposed RMP/Final EIS have been added as **Appendix O**.

This page intentionally left blank.

# Chapter 2. Alternatives

This chapter details Alternatives A through E for the GSENM [Proposed RMP/Final EIS](#) and includes references to maps (**Appendix A**) identifying where allocations would apply. The BLM formulated the alternatives in response to issues and concerns identified through public and internal scoping, to resolve deficiencies with current management strategies, and to explore opportunities for enhanced management of resources and resource uses. A **glossary** with definitions of [commonly used](#) terms can be found following the **references** section of this [Proposed RMP/Final EIS](#).

## 2.1 SUMMARY DESCRIPTION OF THE ALTERNATIVES

RMP decisions consist of identifying and clearly defining goals and objectives (desired outcomes) for resources and resource uses, followed by developing allocations for allowable resource uses (allocations) and management direction necessary for achieving the goals and objectives. These critical determinations guide future land management and subsequent site-specific implementation actions to meet the GSENM's purposes.

Each alternative must respond to the issues identified during scoping, seek to resolve conflicts among resources and resource uses, meet the purpose of and need for the RMP, and be feasible to implement. After considering the issues and the purpose and need, the BLM developed [four](#) alternatives to analyze in detail, in addition to Alternative A, [the No Action Alternative](#) (current management).

Each alternative contains a set of objectives and management directions constituting a distinct possible RMP. Resource program goals are met in varying degrees with the potential for different long-range outcomes and conditions. The relative emphasis given to particular resources and resource uses also differs, including allocations, restoration measures, and specific direction pertaining to individual resource programs. When resources or resource uses are mandated by law or are not tied to planning issues, there are typically few or no distinctions between alternatives.

Quantifiable differences among the alternatives are described in **Table 2-1** (Quantifiable Summary of the Alternatives). **Section 2.4** (Detailed Description of the Alternatives) provides a complete description of proposed decisions for each alternative, including goals, objectives, management direction, and allocations for individual resource programs. Maps in **Appendix A** provide a visual representation of geographic management differences between alternatives.

The BLM used GIS data to perform acreage calculations and to generate the maps in **Appendix A**. Calculations depend on the quality and availability of data. Most calculations in this RMP are rounded to the nearest 100 acres or 1 mile. Given the scale of the analysis, the compatibility constraints between data sets, and the lack of data for some resources, all calculations are approximate; they serve for comparison and analytic purposes only. Likewise, the maps in **Appendix A** are provided for illustrative purposes and are subject to the limitations discussed above. The BLM may receive additional or updated data; therefore, acreages may be recalculated and revised at a later date.

Table 2-1. **Quantifiable<sup>1</sup>** Summary of the Alternatives

| Resource, Resource Use, or Special Designation                   | Alternative A    | Alternative B    | Alternative C    | Alternative D    | Alternative E (Proposed RMP) |
|--|------------------|------------------|------------------|------------------|------------------------------|
| <b>Management Areas (acres)</b>                                  | -                | -                | Figure 2-1       | -                | Figure 2-2                   |
| Front County   | 0                | 0                | 36,600           | 0                | 36,600                       |
| Passage  | 0                | 0                | 53,000           | 0                | 53,000                       |
| Outback  | 0                | 0                | 654,100          | 0                | 558,700                      |
| Primitive  | 0                | 0                | 1,121,700        | 0                | 1,217,100                    |
| <b>Visual Resource Management (VRM) (acres)</b>                  | Figure 2-3       | Figure 2-4       | Figure 2-5       | Figure 2-6       | Figure 2-7                   |
| VRM Class I  | 881,100          | 958,200          | 1,125,400        | 1,443,900        | 1,210,900                    |
| VRM Class II   | 422,300          | 588,200          | 625,000          | 421,700          | 547,500                      |
| VRM Class III  | 346,500          | 319,200          | 115,200          | 0                | 107,200                      |
| VRM Class IV   | 215,700          | 0                | 0                | 0                | 0                            |
| <b>Lands with Wilderness Characteristics (acres)</b>             | Figure 2-8       | Figure 2-9       | Figure 2-10      | Figure 2-11      | Figure 2-12                  |
| Management Strategy 1 (protect)                                  | 0                | 72,000           | 240,600          | 559,600          | 329,400                      |
| Management Strategy 2 (minimize)                                 | 0                | 0                | 312,800          | 0                | 224,100                      |
| Management Strategy 3 (not protect)                              | 559,600          | 487,600          | 6,100            | 0                | 6,100                        |
| <b>Total</b>   | <b>559,600</b>   | <b>559,600</b>   | <b>559,600</b>   | <b>559,600</b>   | <b>559,600</b>               |
| <b>Forestry and Woodland Products (acres)</b>                    | Figure 2-13      | Figure 2-14      | Figure 2-15      | Figure 2-16      | Figure 2-17                  |
| Prohibit noncommercial harvest of forestry and woodland products | 881,100          | 959,300          | 1,127,200        | 1,865,600        | 1,215,900                    |
| <b>Livestock Grazing (acres)</b>                                 | Figure 2-18      | Figure 2-19      | Figure 2-20      | Figure 2-21      | Figure 2-22                  |
| <b>Planning Area<sup>2</sup></b>                                 |                  |                  |                  |                  |                              |
| Available for grazing  | 2,117,300        | 2,042,100        | 2,042,100        | 918,300          | 1,737,300                    |
| Unavailable for grazing  | 139,900          | 215,100          | 215,100          | 1,338,900        | 128,300                      |
| <b>Total</b>   | <b>2,257,200</b> | <b>2,257,200</b> | <b>2,257,200</b> | <b>2,257,200</b> | <b>1,865,600</b>             |

<sup>1</sup> Calculations depend on the quality and availability of data. Most calculations in this RMP are rounded to the nearest 100 acres or 1 mile. Given the scale of the analysis, the compatibility constraints between data sets, and the lack of data for some resources, all calculations are approximate; they serve for comparison and analytic purposes only.

<sup>2</sup> Includes allotments in Glen Canyon managed by the NPS where the BLM administers the grazing for Alternatives A, B, C, and D. These allotments were included in the EIS analysis at the request of the NPS. The RMP has no authority to make decisions regarding availability of livestock grazing allotments in Glen Canyon, so these areas are excluded from the acreage under the Proposed RMP (Alternative E).

| Resource, Resource Use, or Special Designation                            | Alternative A      | Alternative B      | Alternative C      | Alternative D      | Alternative E (Proposed RMP) |
|---|--------------------|--------------------|--------------------|--------------------|------------------------------|
| <b>Decision Area<sup>3</sup></b>  |                    |                    |                    |                    |                              |
| Available for grazing   | 1,817,800          | 1,742,600          | 1,742,600          | 686,300            | 1,737,300                    |
| Unavailable for grazing   | 47,800             | 123,000            | 123,000            | 1,179,300          | 128,300                      |
| <b>Total</b>  | <b>1,865,600</b>   | <b>1,865,600</b>   | <b>1,865,600</b>   | <b>1,865,600</b>   | <b>1,865,600</b>             |
| <b>Recreation (Extensive Recreation Management Areas [ERMAs]) (acres)</b> | <b>Figure 2-23</b> | <b>Figure 2-24</b> | <b>Figure 2-25</b> | <b>Figure 2-26</b> | <b>Figure 2-25</b>           |
| GSENM   | 989,300            | N/A                | N/A                | N/A                | N/A                          |
| Cottonwood Road Recreation Management Zone (RMZ)                          | 2,200              | N/A                | N/A                | N/A                | N/A                          |
| KEPA  | 808,400            | N/A                | N/A                | N/A                | N/A                          |
| Little Desert RMZ   | 2,500              | N/A                | N/A                | N/A                | N/A                          |
| Cottonwood Road RMZ   | 3,100              | N/A                | N/A                | N/A                | N/A                          |
| Fiftymile Mountain  | N/A                | N/A                | 40,900             | N/A                | 40,900                       |
| Buckskin-Five Mile  | N/A                | 129,500            | 59,600             | N/A                | 59,600                       |
| Circle Cliffs-Wolverine   | N/A                | 93,300             | 93,300             | N/A                | 93,300                       |
| Egypt   | N/A                | N/A                | N/A                | 14,100             | N/A                          |
| Escalante Desert  | N/A                | 204,300            | 119,800            | N/A                | 119,800                      |
| Kaiparowits Plateau   | N/A                | 872,900            | N/A                | N/A                | N/A                          |
| Little Desert   | N/A                | 2,400              | N/A                | 2,400              | N/A                          |
| Nephi Pasture   | N/A                | N/A                | 78,800             | N/A                | 78,800                       |
| North Escalante Canyons   | N/A                | 113,400            | N/A                | 113,400            | N/A                          |
| Paria-Hackberry Canyons   | N/A                | 137,500            | N/A                | 121,300            | N/A                          |
| Skutumpah Terrace-Deer Range  | N/A                | 216,800            | 70,500             | N/A                | 70,500                       |
| Smoky Mountains-Left Hand Collett Roads                                   | N/A                | N/A                | 11,000             | N/A                | 11,000                       |
| Spencer Flats-Red Breaks  | N/A                | N/A                | N/A                | 60,700             | N/A                          |
| Wahweap-White Rocks   | N/A                | N/A                | 12,400             | N/A                | 12,400                       |
| <b>Total ERMA</b>   | <b>1,797,700</b>   | <b>1,770,100</b>   | <b>486,300</b>     | <b>311,900</b>     | <b>486,300</b>               |
| <b>Recreation (Special Recreation Management Areas [SRMAs]) (acres)</b>   | <b>Figure 2-23</b> | <b>Figure 2-24</b> | <b>Figure 2-25</b> | <b>Figure 2-26</b> | <b>Figure 2-25</b>           |
| Burr Trail Road   | 5,800              | 5,200              | 5,200              | 5,200              | 5,200                        |
| Deer Creek RMZ  | 600                | N/A                | N/A                | N/A                | N/A                          |
| The Gulch RMZ   | 100                | N/A                | N/A                | N/A                | N/A                          |
| Calf Creek  | 7,000              | N/A                | N/A                | N/A                | N/A                          |
| Cottonwood Canyon Road  | N/A                | 16,100             | 16,100             | 16,100             | 16,100                       |
| Egypt   | N/A                | N/A                | 14,100             | N/A                | 14,100                       |

<sup>3</sup> Excludes allotments in Glen Canyon for Alternatives A, B, C, and D. This information is provided for comparison with the Proposed RMP (Alternative E).

2. Alternatives (Summary Description of the Alternatives)

| Resource, Resource Use, or Special Designation   | Alternative A      | Alternative B      | Alternative C      | Alternative D      | Alternative E (Proposed RMP) |
|--|--------------------|--------------------|--------------------|--------------------|------------------------------|
| Highway 12 - Escalante to Boulder  | N/A                | 22,500             | 22,500             | 3,100              | 22,500                       |
| Lower Calf Creek RMZ   | N/A                | 400                | N/A                | N/A                | N/A                          |
| Upper Calf Creek Watershed RMZ   | N/A                | 2,400              | N/A                | N/A                | N/A                          |
| Upper Calf Creek Falls RMZ   | N/A                | 500                | N/A                | N/A                | N/A                          |
| Highway 89   | N/A                | 10,500             | N/A                | N/A                | N/A                          |
| Hole-in-the-Rock Road  | 23,300             | N/A                | 10,300             | 10,300             | 10,300                       |
| Dance Hall Rock RMZ  | 600                | N/A                | N/A                | N/A                | N/A                          |
| Dry Fork Wash RMZ  | 1,200              | N/A                | N/A                | N/A                | N/A                          |
| Devil's Garden RMZ   | 600                | N/A                | N/A                | N/A                | N/A                          |
| 20-Mile Dinosaur Tracks RMZ  | 300                | N/A                | N/A                | N/A                | N/A                          |
| Egypt Slot Canyons RMZ   | 6,200              | N/A                | N/A                | N/A                | N/A                          |
| House Rock Valley Road   | N/A                | 1,200              | 1,600              | 1,600              | 1,600                        |
| Little Desert  | N/A                | N/A                | 2,400              | N/A                | 2,400                        |
| North Escalante Canyons  | N/A                | N/A                | 113,400            | N/A                | 113,400                      |
| Old Paria  | N/A                | N/A                | 1,200              | 1,200              | 1,200                        |
| Paria Canyons Vermilion Cliffs   | 30,000             | N/A                | N/A                | N/A                | N/A                          |
| Paria-Hackberry Canyons  | N/A                | N/A                | 121,300            | N/A                | 121,300                      |
| Phipps Death Hollow  | N/A                | 39,800             | 39,800             | 53,100             | 39,800                       |
| Skutumpah Road   | 1,500              | N/A                | N/A                | N/A                | N/A                          |
| Skutumpah Corridor   | N/A                | N/A                | 5,300              | 5,300              | 5,300                        |
| Spencer Flats-Red Breaks   | N/A                | N/A                | 59,800             | N/A                | 59,800                       |
| Toadstools   | N/A                | N/A                | 4,400              | 4,400              | 4,400                        |
| <b>Total SRMA</b>  | <b>67,600</b>      | <b>95,300</b>      | <b>417,400</b>     | <b>100,300</b>     | <b>417,400</b>               |
| <b>Total SRMA + ERMA</b>   | <b>1,865,300</b>   | <b>1,865,400</b>   | <b>903,700</b>     | <b>412,200</b>     | <b>903,700</b>               |
| <b>Recreational Shooting (acres)</b>   | <b>Figure 2-27</b> | <b>Figure 2-28</b> | <b>Figure 2-29</b> | <b>Figure 2-30</b> | <b>Figure 2-31</b>           |
| Prohibited   | 8,800              | 914,100            | 1,168,000          | 1,865,600          | 163,000                      |
| Allowed  | 1,856,800          | 951,500            | 697,600            | 0                  | 1,702,600                    |
| <b>Travel and Transportation Management: Off-highway Vehicle (OHV) Area Designations (acres)</b> | <b>Figure 2-32</b> | <b>Figure 2-33</b> | <b>Figure 2-34</b> | <b>Figure 2-35</b> | <b>Figure 2-36</b>           |
| Closed to OHV travel   | 1,500              | 952,000            | 1,209,500          | 1,438,000          | 1,245,700                    |
| OHV travel limited to designated routes  | 1,864,000          | 913,600            | 656,100            | 427,600            | 619,900                      |
| Open to OHV travel   | 100                | 0                  | 0                  | 0                  | 0                            |
| <b>Total</b>   | <b>1,865,600</b>   | <b>1,865,600</b>   | <b>1,865,600</b>   | <b>1,865,600</b>   | <b>1,865,600</b>             |

| <b>Resource, Resource Use, or Special Designation</b>  | <b>Alternative A</b> | <b>Alternative B</b> | <b>Alternative C</b> | <b>Alternative D</b> | <b>Alternative E (Proposed RMP)</b> |
|--|----------------------|----------------------|----------------------|----------------------|-------------------------------------|
| <b>Travel and Transportation Management: OHV Route Closures (miles)</b>  | <b>Figure 2-37</b>   | <b>Figure 2-38</b>   | <b>Figure 2-39</b>   | <b>Figure 2-40</b>   | <b>Figure 2-41</b>                  |
| Routes open to OHVs (per the current travel management plan [TMP]) that would be closed due to OHV closed area designations              | 0                    | 0                    | 7                    | 7                    | 7                                   |
| Routes open to OHVs (per the current TMP) that would be closed due to an implementation-level decision to designate a route as closed    | 0                    | 0                    | 0                    | 4                    | 0                                   |
| <b>Total miles closed</b>  | <b>0</b>             | <b>0</b>             | <b>7</b>             | <b>11</b>            | <b>7</b>                            |
| <b>Travel and Transportation: Routes Claimed by the State of Utah and Kane and Garfield Counties under R.S. 2477 (miles)<sup>4</sup></b> | <b>Figure 2-37</b>   | <b>Figure 2-38</b>   | <b>Figure 2-39</b>   | <b>Figure 2-40</b>   | <b>Figure 2-41</b>                  |
| Located in areas closed to OHV travel  | 0                    | 208                  | 328                  | 396                  | 341                                 |
| Located in areas designated as OHV travel limited to designated routes   | 1,653                | 1,446                | 1,326                | 1,258                | 1,313                               |
| Located in areas open to OHV travel  | 1                    | 0                    | 0                    | 0                    | 0                                   |
| <b>Total</b>   | <b>1,654</b>         | <b>1,654</b>         | <b>1,654</b>         | <b>1,654</b>         | <b>1,654</b>                        |
| <b>Rights-of-Way (ROWs) (acres)</b>  | <b>Figure 2-43</b>   | <b>Figure 2-44</b>   | <b>Figure 2-45</b>   | <b>Figure 2-46</b>   | <b>Figure 2-47</b>                  |
| ROW exclusion area   | 881,300              | 945,700              | 1,163,500            | 1,608,800            | 1,251,800                           |
| ROW avoidance area   | 332,800              | 821,500              | 671,700              | 235,000              | 583,400                             |
| Open to ROW authorization  | 630,400              | 85,100               | 10,900               | 2,300                | 10,900                              |

<sup>4</sup> The State of Utah and its counties may hold valid existing ROWs in the planning area pursuant to Revised Statute 2477 Act of July 28, 1866 (R.S. 2477), Chapter 262, 8,14 (Stat. 252, 253; codified at 43 USC 932). Congress repealed R.S. 2477 through the passage of FLPMA. R.S. 2477 rights are determined through a process that is entirely independent of the BLM's land use planning process. This planning effort is not intended to provide any evidence bearing on or addressing the validity of any R.S. 2477 assertions and does not adjudicate, analyze, or otherwise determine the validity of claimed ROWs. Nothing in this Proposed RMP is intended to extinguish any valid existing ROW or alter in any way the legal rights the state and counties may have to assert and protect R.S. 2477 rights.

2. Alternatives (Summary Description of the Alternatives)

| Resource, Resource Use, or Special Designation         | Alternative A      | Alternative B      | Alternative C      | Alternative D      | Alternative E (Proposed RMP) |
|--|--------------------|--------------------|--------------------|--------------------|------------------------------|
| ROW seasonal avoidance area                            | 21,100             | 13,300             | 19,500             | 19,500             | 19,500                       |
| <b>Designated Corridors (acres)</b>                    | <b>Figure 2-48</b> | <b>Figure 2-48</b> | <b>Figure 2-48</b> | <b>Figure 2-49</b> | <b>Figure 2-48</b>           |
| Corridor 68-116  | 8,600              | 8,600              | 8,600              | N/A                | 8,600                        |
| Highway 89 energy corridor                             | 2,300              | 2,300              | 2,300              | 2,300              | 2,300                        |
| <b>Total</b>   | <b>10,900</b>      | <b>10,900</b>      | <b>10,900</b>      | <b>2,300</b>       | <b>10,900</b>                |
| <b>ACECs and Research Natural Areas (RNAs) (acres)</b> | <b>Figure 2-50</b> | <b>Figure 2-51</b> | <b>Figure 2-51</b> | <b>Figure 2-50</b> | <b>Figure 2-51</b>           |
| Fiftymile Mountain RNA                                 | N/A                | 54,800             | 54,800             | N/A                | 54,800                       |
| No Man's Mesa RNA                                      | 1,500              | 1,500              | 1,500              | 1,500              | 1,500                        |
| <b>Total</b>   | <b>1,500</b>       | <b>56,300</b>      | <b>56,300</b>      | <b>1,500</b>       | <b>56,300</b>                |
| <b>Wild and Scenic Rivers (WSRs)<sup>5</sup></b>       | <b>Figure 2-52</b> | <b>Figure 2-53</b> | <b>Figure 2-53</b> | <b>Figure 2-53</b> | <b>Figure 2-53</b>           |
| <b>Suitable River Segments (miles)<sup>6</sup></b>     | -                  | -                  | -                  | -                  | -                            |
| <i>Escalante River System</i>                          |                    |                    |                    |                    |                              |
| Escalante River #1 (W)                                 | 13.8               | 13.8               | 13.8               | 13.8               | 13.8                         |
| Escalante River #2 (R)                                 | 1.1                | 1.1                | 1.1                | 1.1                | 1.1                          |
| Escalante River #3 (W)                                 | 19.2               | 19.2               | 19.2               | 19.2               | 19.2                         |
| Harris Wash (W)  | 1.1                | 1.1                | 1.1                | 1.1                | 1.1                          |
| Lower Boulder Creek (W)                                | 13.5               | 13.5               | 13.5               | 13.5               | 13.5                         |
| Slickrock Canyon (W)                                   | 2.8                | 2.8                | 2.8                | 2.8                | 2.8                          |
| Lower Deer Creek #1 (R)                                | 3.8                | 3.8                | 3.8                | 3.8                | 3.8                          |
| Lower Deer Creek #2 (W)                                | 7.0                | 7.0                | 7.0                | 7.0                | 7.0                          |
| The Gulch #1 (W)                                       | 11.0               | 11.0               | 11.0               | 11.0               | 11.0                         |
| The Gulch #2 (R)                                       | 0.6                | 0.6                | 0.6                | 0.6                | 0.6                          |
| The Gulch #3 (W)                                       | 13.0               | 13.0               | 13.0               | 13.0               | 13.0                         |
| Steep Creek (W)  | 6.4                | 6.4                | 6.4                | 6.4                | 6.4                          |
| Lower Sand Creek (W)                                   | 10.6               | 10.6               | 10.6               | 10.6               | 10.6                         |
| Willow Patch Creek (W)                                 | 2.6                | 2.6                | 2.6                | 2.6                | 2.6                          |
| Mamie Creek & West Tributary (W)                       | 9.2                | 9.2                | 9.2                | 9.2                | 9.2                          |
| Death Hollow Creek (W)                                 | 9.9                | 9.9                | 9.9                | 9.9                | 9.9                          |
| Calf Creek #1 (W)                                      | 3.5                | 3.5                | 3.5                | 3.5                | 3.5                          |
| Calf Creek #2 (S)                                      | 3.0                | 3.0                | 3.0                | 3.0                | 3.0                          |
| Calf Creek #3 (R)                                      | 1.5                | 1.5                | 1.5                | 1.5                | 1.5                          |
| Twenty-five-mile Wash (W)                              | 6.8                | 6.8                | 6.8                | 6.8                | 6.8                          |
| <i>Paria River System</i>                              |                    |                    |                    |                    |                              |
| Upper Paria River #1 (W)                               | 21.7               | 21.7               | 21.7               | 21.7               | 21.7                         |
| Upper Paria River #2 (R)                               | 16.9               | 16.9               | 16.9               | 16.9               | 16.9                         |

<sup>5</sup> R = recreational, S = scenic, W = wild

<sup>6</sup> The mileage for WSRs under all alternatives is identical.



2. Alternatives (Summary Description of the Alternatives)

| Resource, Resource Use, or Special Designation           | Alternative A      | Alternative B      | Alternative C      | Alternative D      | Alternative E (Proposed RMP) |
|--|--------------------|--------------------|--------------------|--------------------|------------------------------|
| Lower Paria River #1 (R)                                 | 3.3                | 3.3                | 3.3                | 3.3                | 3.3                          |
| Lower Paria River #2 (W)                                 | 4.8                | 4.8                | 4.8                | 4.8                | 4.8                          |
| Deer Creek Canyon (W)                                    | 5.2                | 5.2                | 5.2                | 5.2                | 5.2                          |
| Snake Creek (W)  | 4.7                | 4.7                | 4.7                | 4.7                | 4.7                          |
| Hogeye Canyon (W)  | 6.3                | 6.3                | 6.3                | 6.3                | 6.3                          |
| Kitchen Canyon (W)                                       | 1.3                | 1.3                | 1.3                | 1.3                | 1.3                          |
| Starlight Canyon (W)                                     | 4.9                | 4.9                | 4.9                | 4.9                | 4.9                          |
| Lower Sheep Creek (W)                                    | 1.5                | 1.5                | 1.5                | 1.5                | 1.5                          |
| Hackberry Creek (W)                                      | 20.1               | 20.1               | 20.1               | 20.1               | 20.1                         |
| Lower Cottonwood Creek (R)                               | 2.9                | 2.9                | 2.9                | 2.9                | 2.9                          |
| Buckskin Gulch/Wire Pass (W)                             | 18.0               | 18.0               | 18.0               | 18.0               | 18.0                         |
| <b>Total</b>   | <b>252.2</b>       | <b>252.2</b>       | <b>252.2</b>       | <b>252.2</b>       | <b>252.2</b>                 |
| <b>Eligible River Segments (miles)<sup>6</sup></b>       | -                  | -                  | -                  | -                  | -                            |
| Scorpion Gulch   | 0.8                | 0.8                | 0.8                | 0.8                | 0.8                          |
| Fools Canyon   | <0.0               | <0.0               | <0.0               | <0.0               | <0.0                         |
| Coyote Gulch #2  | 0.7                | 0.7                | 0.7                | 0.7                | 0.7                          |
| <b>Total</b>   | <b>1.5</b>         | <b>1.5</b>         | <b>1.5</b>         | <b>1.5</b>         | <b>1.5</b>                   |
| <b>Wilderness Study Areas (WSAs) (acres)<sup>7</sup></b> | <b>Figure 2-54</b> | <b>Figure 2-54</b> | <b>Figure 2-54</b> | <b>Figure 2-54</b> | <b>Figure 2-54</b>           |
| Burning Hills  | 62,500             | 62,500             | 62,500             | 62,500             | 62,500                       |
| Carcass Canyon   | 47,400             | 47,400             | 47,400             | 47,400             | 47,400                       |
| Death Ridge  | 62,400             | 62,400             | 62,400             | 62,400             | 62,400                       |
| Devil's Garden   | 600                | 600                | 600                | 600                | 600                          |
| Escalante Canyons Tract 1                                | 400                | 400                | 400                | 400                | 400                          |
| Escalante Canyons Tract 5                                | 800                | 800                | 800                | 800                | 800                          |
| Fiftymile Mountain                                       | 148,500            | 148,500            | 148,500            | 148,500            | 148,500                      |
| Mud Spring Canyon  | 38,200             | 38,200             | 38,200             | 38,200             | 38,200                       |
| North Escalante Canyons/The Gulch                        | 119,800            | 119,800            | 119,800            | 119,800            | 119,800                      |
| Paria-Hackberry  | 136,800            | 136,800            | 136,800            | 136,800            | 136,800                      |
| Paria-Hackberry 202                                      | 400                | 400                | 400                | 400                | 400                          |
| Phipps-Death Hollow                                      | 42,700             | 42,700             | 42,700             | 42,700             | 42,700                       |
| Scorpion   | 36,000             | 36,000             | 36,000             | 36,000             | 36,000                       |
| Steep Creek  | 22,000             | 22,000             | 22,000             | 22,000             | 22,000                       |
| The Blues  | 18,800             | 18,800             | 18,800             | 18,800             | 18,800                       |
| The Cockscomb  | 9,900              | 9,900              | 9,900              | 9,900              | 9,900                        |
| Wahweap  | 133,900            | 133,900            | 133,900            | 133,900            | 133,900                      |
| <b>Total</b>   | <b>881,100</b>     | <b>881,100</b>     | <b>881,100</b>     | <b>881,100</b>     | <b>881,100</b>               |

Source: BLM GIS 2022

<sup>7</sup> The acreage for WSAs under all alternatives is identical and has been rounded to the nearest 100 acres.

### 2.1.1 Alternative A

Alternative A represents the no action alternative; it includes the current management from the 2020 GSENM Approved RMP and the 2020 KEPA Approved RMP to the extent that those management actions are consistent with Proclamation 10286. In some cases, decisions in the 2020 Approved RMPs are inconsistent with Proclamation 10286; in those instances, Alternative A reflects management that is consistent with Proclamation 10286. As the no action alternative, Alternative A serves as the baseline comparison against which all the action alternatives (B, C, D, and E) are compared.

Alternative A generally allows for maximum discretionary uses (for example, ROWs and livestock grazing) and emphasizes management flexibility, while still providing for resource protection as required by applicable regulations, laws, policies, plans, and guidance, including the proper care and management of GSENM objects. Alternative A includes the following:

- Recreation Management Areas (RMAs): There would be five SRMAs, two ERMAs, and 10 RMZs. These RMAs would cover the entirety of GSENM.
- OHV Use: OHV use would be limited to designated routes, except in No Mans Mesa RNA (ACEC), which would be closed to OHV use, and the Little Desert RMZ in the former KEPA, which would be open to cross-country OHV use. BLM route designations would be carried forward from the 2000 Monument Management Plan (MMP), except where modified in 2020 by the inclusion of an implementation-level decision to designate two routes for OHV use. These routes are known as the Inchworm Arch Road and the V-Road.
- Recreational Shooting: Recreational shooting would be prohibited within 0.25 miles of residences, campgrounds, and developed recreational facilities. The distance may be increased depending on area-specific conditions.
- Recreational Facilities: The 2020 Approved RMPs do not expressly discuss recreational facilities. However, there are few expressed restrictions outside WSAs on where development could occur.
- Livestock Grazing: Nearly all allotments are available for livestock grazing. All suspended AUMs could be activated over time, pending subsequent analysis and decisions. The 2020 Approved RMPs allow the creation of new nonstructural range improvements where they are not otherwise restricted by another designation. Existing seedings would be restored using a mix of native and nonnative species.
- ACECs and RNAs (ACECs): Under this alternative, management of the previously designated No Mans Mesa RNA (ACEC) would continue. No new ACECs would be designated.
- Vegetation Management: The BLM could use the full range of vegetation management methods and tools (such as prescribed fire; mechanical, chemical, and biological treatments). Treatments would be prioritized in areas where they would improve rangeland health, wildlife habitat, and forage. Nonnative species would be allowed, where necessary, to optimize land health, forage, and productivity in nonstructural range improvements.
- Other Discretionary Actions: Besides WSAs, which are exclusion areas, all lands would be either avoidance areas or open for ROWs, permits, and leases, as allowed by Proclamation 10286. The suitability for these land and realty actions would be assessed on a case-by-case basis. Alternative A also would prohibit the casual collection of all paleontological resources, mineral resources, and

petrified wood to the extent that prohibition does not constitute a substantial burden on the exercise of religion under the Religious Freedom Restoration Act and other applicable laws.

- Lands with Wilderness Characteristics: Lands with wilderness characteristics would not receive any special management to protect size, naturalness, and opportunities for solitude, or primitive and unconfined types of recreation.
- Transportation and Access: Maintenance will be performed in accordance with the 2000 MMP until new TMPs are completed.

### 2.1.2 Alternative B

Alternative B emphasizes flexibility in planning-level direction to maximize the potential for an array of discretionary actions that may be compatible with the protection of GSENM objects. Alternative B includes the following:

- RMAs: Six SRMAs and three RMZs would be established to [protect and enhance a targeted set of activities, experiences, benefits, and desired](#) recreational setting characteristics. Additionally, [eight](#) ERMAs would be designated. These RMAs would cover the entirety of GSENM.
- OHV Use: WSAs/instant study areas (ISAs), lands with wilderness characteristics identified for protection, and No Mans Mesa RNA (ACEC) would be closed to OHV use. The remainder of GSENM would limit OHV travel to designated routes, with some road density and siting criteria identified. No areas would be open to [cross-country](#) OHV use. [BLM route designations under this alternative would be the same as those under Alternative A.](#)
- [Recreational](#) Shooting: Recreational shooting would be prohibited within 0.25 miles of residences, from, on, or across highways, campgrounds, and developed recreation facilities. RNAs (ACECs) and WSAs/ISAs would be closed to [recreational](#) shooting.
- Recreational Facilities: To provide for public health and safety, recreational facilities, such as designated campgrounds and bathrooms, may be developed at some locations. Recreational facilities would be allowed in accordance with RMA prescriptions.
- Livestock Grazing: Allotments that are not under permit would be made unavailable for livestock grazing. Allocated AUMs would be the total permitted use of available allotments. [Within 2 years of the signing the record of decision \(ROD\)](#), land health assessments would be required on allotments within watersheds that have shown a high degree of departure from reference conditions (henceforth, departed watershed). These [nine HUC-10 and HUC-12](#) watersheds (see **Figure 3-24**, Departed Watersheds, **Appendix A**) were identified using data and methods determined by [the](#) BLM Utah State Office relating to water, soils, and vegetation resources. Further analysis is discussed in **Appendix B**.

Changes in grazing practices would be made according to the results of the land health assessments and determinations. New range improvements could be allowed if they are consistent with the protection of GSENM objects. The BLM would prohibit nonstructural range improvements with a primary purpose of increasing forage for livestock. Maintenance of existing structural range improvements would be allowed if both the structural range improvement and maintenance are consistent with the protection of GSENM objects.

- ACECs and RNAs (ACECs): The BLM would designate two RNAs (ACECs). The purpose of these designations would be to protect intact ecosystems where special management—beyond the typical protections provided in GSENM—would be required.

- **Vegetation Management:** Landscape-scale restoration projects would be used to restore functional and resilient vegetation communities. For all vegetation management efforts, potential for lasting resilient restoration would be maximized through the preferential use of native vegetation. Nonnative vegetation may be used in restoration efforts when consistent with project and site-specific consideration and rationale. New discretionary actions would be avoided within 330 feet of riparian areas, unless the action would improve riparian health and result in no adverse impacts on wetlands and riparian areas.
- **Other Discretionary Actions:** Alternative B would accommodate other discretionary actions, such as ROW authorizations. Areas closed to ROW authorizations would include lands with wilderness characteristics, RNAs (ACECs), ACECs, WSAs, the OSNHT, and suitable wild segments of **WSRs**. All other lands would be either avoidance areas or open for ROWs, permits, and leases. To ensure discretionary uses are consistent with the protection of GSENM objects, the BLM would evaluate proposed actions on a project-by-project basis.
- **Lands with Wilderness Characteristics:** The BLM would manage some lands with wilderness characteristics to protect those characteristics (that is, the size, naturalness, and opportunities for solitude or primitive and unconfined recreation). **Therefore, the BLM would eliminate or limit discretionary uses in these areas. For the remaining lands with wilderness characteristics, the BLM would consider discretionary uses that do not protect wilderness characteristics.**
- **Transportation and Access:** Routes could be maintained and improved to meet public health and safety needs and/or to protect GSENM objects.

### 2.1.3 Alternative C

Alternative C emphasizes the protection and maintenance of intact and resilient landscapes using an area management approach to selectively allow for discretionary uses in appropriate settings. Four management areas similar to those used in the 2000 MMP would be established: the front country area, passage area, outback area, and primitive area. **Under Alternative C, the designation of management areas would serve primarily as a tool for managing visitation and allowable uses while also protecting GSENM objects.** Area descriptions under Alternative C include the following:

- **Front Country Area:** The front country area is the focal point for visitation and provides day-use and overnight opportunities that are supported by developed infrastructure. Educating visitors about GSENM objects and **other important** resources **would** be emphasized. The front country area allows for visitor centers and contact stations, primary day-use and interpretation sites, highway waysides and overlooks, developed trails and trailheads, and developed campgrounds. The facilities in this area could accommodate larger groups.
- **Passage Area:** The passage area is the secondary area for visitation and provides day-use and overnight opportunities that are less developed than those found in the front country area. The passage area allows for secondary travel routes that are a mix of paved and unpaved roads, which receive use as throughways and scenic driving routes and provide access to recreation destinations. It also provides access to outback and primitive day-use and overnight opportunities. The passage area is intended to provide basic recreational infrastructure to support a range of recreational activities and allow visitors to learn about GSENM objects and resources. This basic infrastructure includes **day-use** and picnic sites, small campgrounds and designated camping areas, toilets, interpretive sites, waysides, and overlooks **and could include additional, similar visitor facilities in the future.**

- **Outback Area:** The outback area provides a self-directed visitor experience while accommodating motorized and mechanized access on designated routes. Facilities **would** be rare and provided only when essential for resource protection or public safety.
- **Primitive Area:** The primitive area provides an undeveloped, primitive, and self-directed visitor experience without motorized or mechanized recreational access. Facilities **would** be nonexistent, except for limited signs for resource protection or public safety.

Additional descriptions of Alternative C include the following:

- **RMAs:** Fourteen SRMAs would be designated to **protect and enhance a targeted set of activities, experiences, benefits, and desired** recreation setting characteristics. The BLM also would designate eight ERMAs. These RMAs would not cover all lands within GSENM.
- **OHV Use:** The primitive area, **which includes two designated RNAs (ACECs) and areas such as No Mans Mesa, WSAs/ISAs, and some lands with wilderness characteristics,** would be closed to OHV use; **in the remainder of GSENM (front country, passage, and outback areas), the BLM would limit OHV travel to designated routes, with some siting criteria identified. No areas would be open to cross-country OHV use. By closing the primitive area to OHV use, this alternative would result in the closure of a route known as the V-Road to public OHV use. This closure, which is the inherent result of a planning-level decision (that is, the OHV area designation) is not an implementation-level decision. No other designated routes would be closed under this alternative.**
- **Recreational Shooting:** Recreational shooting would be prohibited in the front country and primitive areas. In the passage and outback areas, **recreational** shooting would be prohibited within 0.25 miles of residences, campgrounds, and developed recreation facilities.
- **Recreational Facilities:** Management areas would identify areas in which recreational facilities could be developed to meet future recreational needs. In general, the front country would allow for facilities to accommodate larger groups, while facilities would be nonexistent in the primitive area.
- **Livestock Grazing:** Allotments that are not under permit would be made unavailable for livestock grazing. Allocated AUMs would be the total permitted use of available allotments. Land health assessments would be required within 2 years of the RMP/EIS ROD on allotments within departed watersheds. Changes in grazing practices would be made according to the results of the land health assessments and determinations. No new structural range improvements would be permitted unless a current (within the last 10 years) land health assessment and determination are completed for the allotment, unless the improvement would provide protection of GSENM objects. The BLM would prohibit nonstructural range improvements with a primary purpose of increasing forage for livestock.
- **ACECs and RNAs (ACECs):** Under this alternative, the BLM would designate **two** RNAs (ACECs).
- **Vegetation Management:** For all vegetation management efforts, maximize potential for lasting resilient restoration through the preferential use of native vegetation. Nonnative vegetation may be used in restoration efforts as consistent with project and site-specific consideration and rationale. To best support recovery of site integrity and **resiliency**, use adaptive management to ensure that health of these efforts is maintained. The front country, passage, **and outback** areas would focus on proactive management, while the primitive area would focus on natural processes. New discretionary actions would be avoided within 330 feet of riparian areas in all areas. In the front country, passage, and outback areas, the action must not result in adverse impacts on wetland and riparian areas. In the primitive area, the action must enhance the riparian area.

- **Other Discretionary Actions:** Alternative C would prohibit soil-disturbing actions in the outback and primitive areas to protect and restore soil health, which is foundational for healthy ecosystems. Areas closed to ROW authorizations would include lands with wilderness characteristics, RNAs (ACECs), WSAs, the OSNHT, and suitable wild WSR segments (that are within the outback and primitive areas), and the primitive area. All other lands would be either avoidance areas or open for ROWs, permits, and leases. The BLM would authorize access ROWs to private inholdings, if required by law or regulation.
- **Lands with Wilderness Characteristics:** All lands with wilderness characteristics in the primitive area would be managed to protect those characteristics (that is, size, naturalness, and opportunities for solitude or primitive and unconfined recreation) while providing for compatible uses. The BLM would manage all lands with wilderness characteristics in the passage and outback areas to minimize impacts on wilderness characteristics while allowing for compatible uses. Only lands with wilderness characteristics in the front country area would be managed for other uses while not protecting wilderness characteristics.
- **Transportation and Access:** Routes could be maintained and improved to meet public health and safety needs and to protect GSENM objects.

#### 2.1.4 Alternative D

Alternative D strives to maximize natural processes by minimizing active management and limiting discretionary uses. Land use allocations would curtail discretionary uses, including recreation, livestock grazing, ROWs, and activities under special recreation permits (SRPs). This alternative would [also constrain active management even when it could restore resilient natural conditions and ecosystem functions](#). Alternative D includes the following:

- **RMA:** The BLM would designate [nine](#) SRMAs and [five](#) ERMAs under this alternative. These RMAs would not cover all lands within GSENM. This alternative would designate the least amount of acres within RMAs.
- **OHV Use:** This alternative would designate more lands as closed to OHV use than any other alternative. [Siting criteria would be identified to ensure the protection of GSENM objects. No areas would be open to OHV use. This alternative would close two designated routes: the V-Road and Inchworm Arch Road. The closure of the V-Road would result from an OHV area designation and, therefore, would not be an implementation-level decision. By comparison, the closure of Inchworm Arch Road would not result from an OHV area designation; this closure would be an implementation-level decision. For this reason, this alternative includes implementation-level analysis associated with the proposed closure of the Inchworm Arch Road.](#)
- **Recreational Shooting:** Recreational shooting would not be allowed anywhere within the boundaries of GSENM.
- **Recreational Facilities:** Recreational facilities would be allowed in accordance with RMA prescriptions. The BLM would prohibit new facilities in areas outside RMAs, except for signage.
- **Livestock Grazing:** Allotments that are not under permit would be made unavailable for livestock [grazing](#). For all allotments in GSENM, completed land health assessments and fully processed permit renewals would be required within 10 years of the signing of the ROD. No new structural range improvements would be permitted unless a current (within 10 years) land health assessment and determination are completed for the allotment, unless the improvement would provide

protection of GSENM objects. Nonstructural range improvements with a primary purpose of increasing forage for livestock would be prohibited.

- ACECs and RNAs (ACECs): Under Alternative D, management of the previously designated No Mans Mesa RNA (ACEC) would continue. No new ACECs would be designated.
- Vegetation Management: Vegetation management methods would prioritize natural processes and techniques over other methods. New discretionary actions would be avoided within 330 feet of riparian areas unless the action would enhance riparian areas. Nonnative species could only be used with approval or for emergency actions.
- Other Discretionary Actions: The BLM would authorize access ROWs to private inholdings, if required by law or regulation. Under Alternative D, the BLM would manage the most acres of ROW exclusion. Under Alternative D, corridor 68-116 would no longer be designated as a 368 Energy Corridor under the Energy Policy Act of 2005, and the BLM would no longer focus placement of major ROWs in that corridor.
- Lands with Wilderness Characteristics: The BLM would manage all lands with wilderness characteristics to protect those characteristics (that is, size, naturalness, and opportunities for solitude or primitive and unconfined recreation) while providing for compatible uses.
- Transportation and Access: Routes could be maintained and improved to meet public health and safety needs.

### 2.1.5 Alternative E (Proposed RMP)

Alternative E, the Proposed RMP, is based on Alternative C, the preferred alternative in the Draft EIS, and similarly emphasizes the protection and maintenance of intact and resilient landscapes using an area management approach to selectively allow for discretionary uses in appropriate settings. Four management areas, like those used under Alternative C, would be established with modifications to the primitive and outback areas; these modifications would result in an increased number of acres designated as the primitive area and a decreased number of acres designated as the outback area. These modifications would support consistent application of the management areas based on the management area descriptions. Also, these are more similar to management area designations in the 2000 MMP.

Descriptions of Alternative E include the following:

- RMAs: The same 14 SRMAs and 8 ERMAs would be designated as under Alternative C; these would not cover all lands within GSENM.
- OHV Use: The same types of management areas would be closed to OHV use and limited to OHV use under Alternative E as under Alternative C; however, there would be changes to the number of acres to reflect the modifications to the primitive and outback areas, as identified in Alternative E. Within areas designated as OHV limited, future route designation would have to protect and enhance GSENM objects and resources and/or increase public safety. Like Alternative C, the area designations under this alternative would result in the closure of the V-Road. No other designated routes would be closed.
- Recreational Shooting: Recreational shooting would be prohibited in the front country area and within 600 feet of locations with archaeological and historic resources throughout GSENM. In the passage, outback, and primitive areas, recreational shooting would be prohibited for purposes of public safety within 600 feet of residences, campgrounds, developed recreation facilities, and a few identified roads within the passage zone.

- **Recreational Facilities:** Alternative E would include the same management area-based allowance for the development of recreational facilities as under Alternative C.
- **Livestock Grazing:** The same allotments that would be made unavailable for livestock grazing under Alternatives B and C would be unavailable under Alternative E. Plus, four pastures and the Long Canyon Stock Driveway would be unavailable but allow livestock trailing, as necessary. Allocated AUMs would be the total permitted use of available allotments, which would be 54 fewer AUMs under the Proposed RMP (Alternative E) than under Alternative C. Land health assessment requirements and structural range improvement directions would be the same as under Alternative C.
- **ACECs and RNAs (ACECs):** The same two RNAs (ACECs) would be designated as under Alternative C.
- **Vegetation Management:** Vegetation management efforts—preferential use of native vegetation, adaptive management, avoidance of riparian areas, and management area-based strategies—would be similar to those under Alternative C.
- **Other Discretionary Actions:** Alternative E would include the same or similar management for soil-disturbing actions and ROW authorizations as Alternative C. Alternative E would also include the OSNHT Management Corridor as ROW avoidance.
- **Lands with Wilderness Characteristics:** Under Alternative E, lands with wilderness characteristics would be managed in the same management area-based manner as under Alternative C.
- **Transportation and Access:** Route maintenance and improvement would be managed the same as under Alternative C.

## 2.2 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

### 2.2.1 Discontinue Livestock Grazing from the Entirety of GSENM

The BLM considered an alternative that would discontinue livestock grazing from GSENM; however, implementing a “no grazing” alternative would be considered remote and speculative. Grazing effects are often site specific and not evenly distributed. Because of the diversity of ecotypes and large landscape of GSENM, grazing is potentially consistent with the protection of GSENM objects in certain portions of the monument. The BLM reviewed monitoring data and remote sensing data to better understand land health ([Appendix B](#)). The data identified departed watersheds, as previously described. In these departed watersheds, the BLM would consider discontinuing livestock grazing under Alternative D. However, the monitoring and remote sensing data did not suggest that grazing is incompatible with the protection of objects in all portions of GSENM, making it unlikely that the BLM would be able to justify selecting such an alternative (see [Appendix B](#)). Therefore, because implementation of a no-grazing alternative is remote and speculative, a no-grazing alternative was not analyzed in detail.

Notably, under the action alternatives ([Alternatives B, C, D, and E](#)), the BLM would prioritize the completion of land health assessments and permit renewals across GSENM. Where a categorical exclusion cannot be used to fully process a grazing permit, a no-grazing alternative would be considered in the NEPA document consistent with BLM Instruction Memorandum 2012-169. Analyzing a no-grazing alternative within this EIS would involve broad landscape considerations of effects across the nearly 2 million acres of GSENM, whereas a site-specific analysis of “no grazing” during the permitting processes would provide a more specific understanding of grazing’s effects on allotments, land health, and GSENM objects.



### 2.2.2 Make the Entirety of GSENM Available for Livestock Grazing

The BLM considered an alternative that would make the entire GSENM available for livestock grazing. This alternative was eliminated from detailed analysis because it is substantially similar in design and would have substantially similar effects to Alternative A. Under Alternative A, the majority of GSENM is available for livestock grazing, with the exception two areas where grazing is either legally or physically prohibited: (1) the allotment that has been retired from livestock grazing as the result of a grazing permittee voluntarily relinquishing their permit, in accordance with Proclamation 10286; and (2) No Mans Mesa, a sky island that is generally inaccessible to livestock. With the exception of those two areas, Alternative A makes approximately 94.3 percent of GSENM available for livestock grazing. As such, analyzing an alternative that would allow grazing on the entirety of GSENM where it is not legally or physically prohibited would have substantially similar effects to Alternative A.

### 2.2.3 Phase Out Grazing in All Areas Not Compatible with Protection of GSENM Objects

The BLM considered an alternative that would include the strategic phasing out of grazing in all areas where grazing is not clearly compatible with the protection of GSENM objects. However, implementing such an alternative would be considered remote and speculative. Grazing effects are often site specific and not evenly distributed. Because of GSENM's diversity of ecotypes and large landscape, grazing is potentially consistent with the protection of GSENM objects. The BLM reviewed monitoring data and remote sensing data to better understand land health (**Appendix B**). The data identified departed watersheds, as previously described. In these departed watersheds, the BLM would consider discontinuing livestock grazing under Alternative D.

Notably, under the action alternatives (Alternatives B, C, D, and E), the BLM would prioritize the completion of land health assessments and permit renewals across GSENM. Where a categorical exclusion cannot be used to fully process a grazing permit, a no-grazing alternative would be considered in the NEPA document consistent with BLM Instruction Memorandum 2012-169. Analyzing a phase-out alternative within this RMP/EIS would involve broad landscape considerations of effects across the nearly 2 million acres of GSENM, whereas a site-specific analysis of "no grazing" during the permitting processes would provide a more specific understanding of grazing's effects on allotments, land health, and GSENM objects.

## 2.3 DEVELOPMENT OF THE PROPOSED RMP

The BLM land use planning regulations require the BLM to identify a preferred alternative in the **Draft RMP/EIS**. The Paria River District Manager **recommended** Alternative C as the preferred alternative in the **Draft RMP/EIS**. The identification of the preferred alternative **did** not constitute a commitment or decision; the BLM **was** simply identifying that Alternative C **provided** the most useful starting point from which to construct a Proposed RMP.

During public review of the **Draft RMP/EIS**, the BLM **sought** constructive input regarding the proposals for managing resources and resource uses. The BLM **developed** a Proposed RMP, **Alternative E**, to be evaluated in **this Final EIS**. The BLM **used** Alternative C as its basis and **revised** it based on the consideration of public comments, cooperating agency and government-to-government consultation, updates to the best and available science and information, and by combining elements of the alternatives analyzed in the **Draft RMP/EIS**. Alternative E, the Proposed RMP, is within the range of alternatives considered in the **Draft RMP/EIS**.

Like the preferred alternative in the Draft RMP/EIS, the Proposed RMP (Alternative E) emphasizes the protection and maintenance of intact and resilient landscapes using an area management approach to selectively allow for discretionary uses in appropriate settings. Four management areas similar to those used in the 2000 MMP would be established: the front country area, passage area, outback area, and primitive area. Under Alternative E, the designation of management areas would serve primarily as a tool for managing visitation and allowable uses while also protecting GSENM objects.

## 2.4 DETAILED DESCRIPTION OF THE ALTERNATIVES

**Section 2.4.3** is a description of all decisions proposed for each alternative, including goals, objectives, allocations, and management direction. All decisions in **Section 2.4.3** are land use plan-level decisions, with the exception of some decisions that are implementation-level decisions, as identified.

### 2.4.1 How to Read Section 2.4.3

The following describes how the alternatives matrix in **Section 2.4.3** is written and formatted to show the land use plan decisions proposed for each alternative. Refer to **Diagram 2-1** on the next page for an example of how to read **Section 2.4.3**.

- Per the BLM's Land Use Planning Handbook H-1601-1, land use plan decisions are broadscale decisions that guide future land management directions and subsequent site-specific implementation decisions. Land use plan decisions establish the base structure for desired outcomes through **goals** and **objectives**, and **allocations for allowable resource uses** and **management direction** to achieve outcomes.
- *Goals* are broad statements of desired outcomes and management direction that usually are not quantifiable.
- *Objectives* identify specific desired outcomes for resources. Objectives may be quantifiable and measurable, and they may have established time frames for achievement, as appropriate.
- *Allocations* for allowable resource use identify uses, or allocations, which are allowed, restricted, or prohibited on public lands and mineral estates.
- *Management direction* identifies actions to attain desired outcomes (objectives), including program constraints, general management practices, and support actions. These are measures that will be applied to all subsequent relevant implementation activities to achieve management objectives.
- *Designations* identify geographic areas of public land where management is directed toward one or more priority resource values or uses. They include two types:
  - *Administrative designations*, identified in BLM or U.S. Department of the Interior program-specific policies or regulations, are established through the BLM's land use planning process to achieve RMP objectives.
  - *Nondiscretionary designations* are those that can only be established by the President, Congress, or the Secretary of the Interior pursuant to specific legal authority.
- In general, only those resources and resource uses that have associated issues have notable differences between the alternatives. Management direction that is applicable to more than one alternative is indicated by denoting that management direction is the same. For example, the direction will say, "Same as Alternative B."
- Throughout the matrix, the term "discretionary actions" is used to mean actions that require approval from the BLM Authorized Officer.

**Diagram 2-1  
How to Read the Alternatives Matrix**

| Row No. | Alternative A  | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP  |
|---------|--|--|---------------|---------------|--|---|--|
|         | <b>AIR QUALITY</b>   |  |               |               | <b>Not for analysis. For comparison only.</b>  |   |  |
| 5.      | <b>Objective:</b><br>Reduce visibility-impairing pollutants in accordance with the reasonable progress goals and timeframes established in the State of Utah's Regional Haze State Implementation Plan.                | <b>Objective:</b><br>Minimize visibility-impairing pollutants in accordance with the reasonable progress goals and timeframes established in the State of Utah's Regional Haze State Implementation Plan and within the scope of the BLM authority.  |               |               | <b>Objective:</b><br>Reduce visibility-impairing pollutants in accordance with the reasonable progress goals and time frames established in the State of Utah's Regional Haze State Implementation Plan. (GSENM ROD 2020, KEPA ROD 2020)               | <b>Objective:</b><br>No similar objective.  | <b>Objective:</b><br>Minimize visibility-impairing pollutants in accordance with the reasonable progress goals and timeframes established in the State of Utah's Regional Haze State Implementation Plan and within the scope of the BLM authority.  |
| 6.      | <b>Objective:</b><br>Manage public land activities consistent with at least the federal Class II area standards and visibility (regional haze) criteria, and no less than any local governments' air quality criteria. |  |               |               | <b>Objective:</b><br>Manage public land activities consistent with at least the federal Class II area standards and visibility (regional haze) criteria, and no less than any local governments' air quality criteria. (GSENM ROD 2020, KEPA ROD 2020) | <b>Objective:</b><br>The Monument will continue to be managed as a Prevention of Significant Deterioration Class II area designated by the Clean Air Act.   | <b>Objective:</b><br>Manage public land activities consistent with at least the federal Class II area standards and visibility (regional haze) criteria, and no less than any local governments' air quality criteria.   |
| 7.      | <b>Management Direction:</b><br>Mitigate actions that are projected to exceed ambient air quality standards or adversely affect visibility (regional haze) in the Class I airsheds.                                    | <b>Management Direction:</b><br>Mitigate actions that are shown to either (1) exceed ambient air quality standards or (2) adversely affect visibility (regional haze) in the Class I airsheds.   |               |               | <b>Management Direction:</b><br>Mitigate actions that are projected to exceed ambient air quality standards or adversely affect visibility (regional haze) in the Class I airsheds. (GSENM ROD 2020, KEPA ROD 2020)                                    | <b>Management Direction:</b><br>All BLM actions and use authorizations will be designed or stipulated so as to protect air quality within the Monument and the Class I areas on surrounding federal lands.  | <b>Management Direction:</b><br>Mitigate actions that are shown to either (1) exceed ambient air quality standards or (2) adversely affect visibility (regional haze) in the Class I airsheds.   |
| 8.      | <b>Management Direction:</b><br>No similar management direction.   | <b>Management Direction:</b><br>Collaborate with federal and state regulatory agencies and land management agencies in and near GSENM for activities identified as having impacts on regional air quality, air quality related values (visibility and atmospheric deposition), and mitigation. |               |               | <b>Management Direction:</b><br>No similar management direction.   | <b>Management Direction:</b><br>Mitigation will be incorporated into project proposals to reduce air quality degradation. Projects will be designed to minimize further degradation of existing air quality. New emission sources will be required to apply control measures to reduce emissions. | <b>Management Direction:</b><br>Collaborate with federal and state regulatory agencies and land management agencies in and near GSENM for activities identified as having impacts on regional air quality, air quality related values (visibility and atmospheric deposition), and mitigation. |
| 9.      | <b>Management Direction:</b><br>No similar management direction.   | <b>Management Direction:</b><br>Work cooperatively with state, federal, and tribal entities to address regional air quality issues that are influenced or affected by the BLM land management actions.   |               |               | <b>Management Direction:</b><br>No similar management direction.   | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>Work cooperatively with state, federal, and tribal entities to address regional air quality issues that are influenced or affected by the BLM land management actions.   |

Merged cells indicate management direction would be the same across those alternatives.

Where Alternative C does not denote different management direction by area, it would be the same across all areas.

The 2020 GSENM and KEPA RMPs and the 2000 MMP are provided for reference.

Blue text indicates changes or additions made since the Draft EIS, such as the addition of the Proposed RMP (Alternative E).

As noted previously, Alternative A represents the decisions from the 2020 GSENM and KEPA Approved RMPs [consistent with](#) Proclamation 10286. For context, the decisions from the 2020 Approved RMPs are provided in the alternatives matrix in **Section 2.4.3**. Decisions from the 2000 MMP are also provided; this is because that plan was [in effect](#) for 20 years and is familiar to the public, users of GSENM, and state and local governments. It also included area management, similar to [that under](#) Alternative C. For these reasons, as well as the short time frame that the 2020 plans have been in effect, the 2000 MMP is also provided as a point of reference.

#### **2.4.2 Components Common to Alternatives B, C, and D and the Proposed RMP**

- All actions in GSENM will be consistent with the protection of GSENM objects. [Additionally, all actions must minimize impacts on other GSENM resources, unless more specific management is identified in this plan for the management of those other GSENM resources.](#)
- [For the purposes of this RMP, the protection of GSENM objects includes the conservation and, where necessary, restoration of such objects, even if not explicitly stated in this RMP.](#)
- The BLM will coordinate or consult, as appropriate, with local and state governments, Tribal Nations, and other federal agencies regarding implementation activities (such as projects and implementation plans).
- [The entirety of GSENM qualifies as a special area under 43 CFR 2932.5. In addition to being officially designated by presidential order \(Presidential Proclamations 6920 and 10286\), the entire area consists of resources that require special management and control measures for their protection, including a renowned collection of cultural resources, many of which are sacred to several Tribal Nations. In other words, even if GSENM were not designated as a national monument, the area encompassed by GSENM would qualify as a special area under 43 CFR 2932.5.](#)
- The BLM will implement the management direction to the extent of its jurisdiction.
- [Agencies would coordinate with the Monument Advisory Committee \(MAC\), as appropriate, to receive information and advice on future maintenance and/or to amend this plan, as well as in the site-specific implementation-level management that follows this plan.](#)
- The BLM will facilitate increased scientific research that furthers understanding of GSENM objects and resources.
- The BLM will catalog, inventory, assess, and monitor GSENM objects using standardized methods, where they exist.
- [Public education and outreach will be included as part of the Proposed RMP.](#)
- Consistent with Proclamation 10286, this [RMP](#) is subject to valid existing rights. The agency will determine what constitutes a valid existing right, in accordance with applicable law.
- The BLM will prohibit collection of GSENM objects and resources, including, but not limited to, rocks; petrified wood; fossils; plants; bones; parts of plants, animals, fish, insects, or other invertebrate animals; other products from animals; or other items from within GSENM, except where the collection is specifically permitted under applicable BLM authority or pursuant to the legal harvest of game (including shed antlers and horns), or the prohibition is inconsistent with the Religious Freedom Restoration Act or other applicable law. For example, casual collection would not be prohibited where such prohibition constitutes a substantial burden on Tribal Nations' religious practices.

- The BLM recognizes the evidence that lead ammunition can have an adverse effect on the California condor (e.g., see the summary provided by the Utah Division of Wildlife Resources at <https://wildlife.utah.gov/condors.html>). To help protect California condors, the agency encourages hunters to consider using non-lead ammunition when hunting within GSENM.
- The BLM will manage livestock grazing to meet the Standards for Rangeland Health and Guidelines for Grazing Management for BLM Lands in Utah (BLM 1997) in a manner that is consistent with the protection of GSENM objects.
- Habitat for greater sage-grouse occurs in GSENM. The BLM will implement the relevant decisions from the operative Greater Sage-grouse RMP amendment(s) applicable to habitat in GSENM. The BLM is currently developing a draft RMP amendment and EIS for greater sage-grouse. Once finalized, the BLM would implement the relevant decisions of the new plan that are applicable to habitat in GSENM.
- Following approval of the RMP, the BLM will develop implementation-level plans per management direction.
- Motorized aircraft (including, but not limited to, fixed-wing aircraft, helicopter, powered paragliders, electric aircraft, and unmanned aircraft systems) are managed as OHVs (43 CFR 8340) when on or immediately over BLM-managed lands and waters.
- The BLM will apply the best management practices (BMPs) in Appendix C.

**2.4.3 Alternatives Comparison**

|  |      |   |       |
|--|------|---|-------|
| Management Areas.....                      | 2-21 | Forestry and Woodland Products.....       | 2-95  |
| Air Quality.....                           | 2-22 | Livestock Grazing.....                    | 2-99  |
| Soil Resources.....                        | 2-25 | Recreation and Visitor Services.....      | 2-117 |
| Vegetation.....                            | 2-30 | Travel and Transportation Management..... | 2-134 |
| Water Resources.....                       | 2-39 | Lands and Realty.....                     | 2-143 |
| Cultural Resources.....                    | 2-48 | Renewable Energy.....                     | 2-154 |
| Tribal Stewardship.....                    | 2-50 | Areas of Critical Environmental Concern   |       |
| Paleontological Resources and Geology..... | 2-58 | and Research Natural Areas.....           | 2-155 |
| Fish and Wildlife.....                     | 2-62 | Special Area Designations.....            | 2-157 |
| Special Status Species.....                | 2-68 | National Historic Trails.....             | 2-158 |
| Visual Resources.....                      | 2-80 | Scenic Routes.....                        | 2-162 |
| Night Skies.....                           | 2-84 | Wild and Scenic Rivers.....               | 2-163 |
| Natural Soundscapes.....                   | 2-85 | Wilderness Study Areas (WSAs).....        | 2-167 |
| Fire Management.....                       | 2-87 | Public Health and Safety.....             | 2-170 |
| Lands with Wilderness Characteristics..... | 2-90 | Science.....                              | 2-171 |
| Wild Horses and Burros.....                | 2-94 |   |       |

This page intentionally left blank.

| Row No. | Alternative A                                | Alternative B                                | Alternative C  | Alternative D                                | 2020 GSENM and KEPA RMPs                      | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP  |
|---------|--|--|--|--|---|--|--|
| -       | <b>MANAGEMENT AREAS</b>                      |  |  |  | <b>Not for analysis. For comparison only.</b> |  | -  |
| I.      | <b>Allocation:</b><br>No similar allocation. | <b>Allocation:</b><br>No similar allocation. | <b>Allocation:</b><br>Allocate the following management areas:<br><ul style="list-style-type: none"> <li>• Front country: 36,600 acres</li> <li>• Passage: 53,000 acres</li> <li>• Outback: 654,100 acres</li> <li>• Primitive: 1,121,700 acres</li> </ul> | <b>Allocation:</b><br>No similar allocation. | <b>Allocation:</b><br>No similar allocation.  | <b>Allocation:</b><br>Allocate the following management areas:<br><ul style="list-style-type: none"> <li>• Front country: 78,056 acres</li> <li>• Passage: 39,037 acres</li> <li>• Outback: 537,748 acres</li> <li>• Primitive: 1,210,579 acres</li> </ul> | <b>Allocation:</b><br>Allocate the following management areas:<br><ul style="list-style-type: none"> <li>• Front country: 36,600 acres</li> <li>• Passage: 53,000 acres</li> <li>• Outback: 558,700 acres</li> <li>• Primitive: 1,217,100 acres</li> </ul> |

| Row No. | Alternative A  | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP  |
|---------|--|--|---------------|---------------|--|---|--|
| -       | <b>AIR QUALITY</b>   |  |               |               | <b>Not for analysis. For comparison only.</b>  |   | -  |
| 2.      | <p><b>Goal:</b><br/>Minimize the impact of management actions on air quality in GSENM by complying with all applicable state and local air quality laws, rules, and regulations.</p>             | <p><b>Goal:</b><br/>Minimize the impact of management actions on air quality in GSENM by complying with all applicable air quality laws, rules, and regulations.</p> <p>Maintain the excellent air quality and air quality related values contained in and near GSENM.</p> <p>Maintain or improve the air quality and air quality related values at sensitive areas (for example, Class I areas) in and near GSENM.</p> <p>Minimize fugitive dust transport from GSENM to maintain visibility and limit dust deposition on snow.</p> |               |               | <p><b>Goal:</b><br/>Minimize the impact of management actions on air quality in the planning area by complying with all applicable State and local air quality laws, rules, and regulations. (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Goal:</b><br/>The BLM's objective with regard to air quality is to ensure that authorizations granted to use public lands and that the BLM's own management programs comply with and support local, state, and federal laws, regulations, and implementation plans pertaining to air quality.</p> | <p><b>Goal:</b><br/>Minimize the impact of management actions on air quality in GSENM by complying with all applicable air quality laws, rules, and regulations.</p> <p>Maintain the excellent air quality and air quality related values contained in and near GSENM.</p> <p>Maintain or improve the air quality and air quality related values at sensitive areas (for example, Class I areas) in and near GSENM.</p> <p>Minimize fugitive dust transport from GSENM to maintain visibility and limit dust deposition on snow.</p> |
| 3.      | <p><b>Objective:</b><br/>Manage atmospheric deposition pollutants to below generally accepted levels of concern and levels of acceptable change.</p>   | <p><b>Objective:</b><br/>Work with the state, EPA, and other appropriate regulatory agencies and organizations when deposition of atmospheric pollutants originating outside of GSENM is identified as negatively affecting ecosystems, vegetation, and wildlife within GSENM.</p>   |               |               | <p><b>Objective:</b><br/>Manage atmospheric deposition pollutants to below generally accepted levels of concern and levels of acceptable change. (GSENM ROD 2020, KEPA ROD 2020)</p>   | <p><b>Goal:</b><br/>No similar objective.</p>   | <p><b>Objective:</b><br/>Work with the state, EPA, and other appropriate regulatory agencies and organizations when deposition of atmospheric pollutants originating outside GSENM is identified as negatively affecting ecosystems, vegetation, and wildlife within GSENM.</p>  |
| 4.      | <p><b>Objective:</b><br/>Maintain concentrations of criteria pollutants in compliance with applicable state and federal ambient air quality standards within the scope of the BLM authority.</p> | <p><b>Objective:</b><br/>Maintain or reduce concentrations of criteria pollutants in compliance with applicable state and federal ambient air quality standards within the scope of the BLM authority.</p>   |               |               | <p><b>Objective:</b><br/>Maintain concentrations of criteria pollutants in compliance with applicable state and federal ambient air quality standards within the scope of BLM authority. (GSENM ROD 2020, KEPA ROD 2020)</p>     | <p><b>Objective:</b><br/>No similar objective.</p>  | <p><b>Objective:</b><br/>Maintain or reduce concentrations of criteria pollutants in compliance with applicable state and federal ambient air quality standards within the scope of the BLM's authority.</p>   |



| Row No. | Alternative A  | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP  |
|---------|--|--|---------------|---------------|--|---|--|
| -       | <b>AIR QUALITY</b>   |  |               |               | Not for analysis. For comparison only.   |   | -  |
| 5.      | <b>Objective:</b><br>Reduce visibility-impairing pollutants in accordance with the reasonable progress goals and <b>time frames</b> established in the State of Utah’s Regional Haze State Implementation Plan.        | <b>Objective:</b><br>Minimize visibility-impairing pollutants in accordance with the reasonable progress goals and <b>time frames</b> established in the State of Utah’s Regional Haze State Implementation Plan and within the scope of the BLM authority.                                    |               |               | <b>Objective:</b><br>Reduce visibility-impairing pollutants in accordance with the reasonable progress goals and time frames established in the State of Utah’s Regional Haze State Implementation Plan. (GSENM ROD 2020, KEPA ROD 2020)               | <b>Objective:</b><br>No similar objective.  | <b>Objective:</b><br>Minimize visibility-impairing pollutants in accordance with the reasonable progress goals and time frames established in the State of Utah’s Regional Haze State Implementation Plan and within the scope of the BLM’s authority.   |
| 6.      | <b>Objective:</b><br>Manage public land activities consistent with at least the federal Class II area standards and visibility (regional haze) criteria, and no less than any local governments’ air quality criteria. |  |               |               | <b>Objective:</b><br>Manage public land activities consistent with at least the federal Class II area standards and visibility (regional haze) criteria, and no less than any local governments’ air quality criteria. (GSENM ROD 2020, KEPA ROD 2020) | <b>Objective:</b><br>The Monument will continue to be managed as a Prevention of Significant Deterioration Class II area designated by the Clean Air Act.   | <b>Objective:</b><br>Manage public land activities consistent with at least the federal Class II area standards and visibility (regional haze) criteria, and no less than any local governments’ air quality criteria.   |
| 7.      | <b>Management Direction:</b><br>Mitigate actions that are projected to exceed ambient air quality standards or adversely affect visibility (regional haze) in the Class I airsheds.                                    | <b>Management Direction:</b><br>Mitigate actions that are shown to either (1) exceed ambient air quality standards or (2) adversely affect visibility (regional haze) in the Class I airsheds.   |               |               | <b>Management Direction:</b><br>Mitigate actions that are projected to exceed ambient air quality standards or adversely affect visibility (regional haze) in the Class I airsheds. (GSENM ROD 2020, KEPA ROD 2020)                                    | <b>Management Direction:</b><br>All BLM actions and use authorizations will be designed or stipulated so as to protect air quality within the Monument and the Class I areas on surrounding federal lands.  | <b>Management Direction:</b><br>Mitigate actions that are shown to either (1) exceed ambient air quality standards or (2) adversely affect visibility (regional haze) in the Class I airsheds.   |
| 8.      | <b>Management Direction:</b><br>No similar management direction.   | <b>Management Direction:</b><br>Collaborate with federal and state regulatory agencies and land management agencies in and near GSENM for activities identified as having impacts on regional air quality, air quality related values (visibility and atmospheric deposition), and mitigation. |               |               | <b>Management Direction:</b><br>No similar management direction.   | <b>Management Direction:</b><br>Mitigation will be incorporated into project proposals to reduce air quality degradation. Projects will be designed to minimize further degradation of existing air quality. New emission sources will be required to apply control measures to reduce emissions. | <b>Management Direction:</b><br>Collaborate with federal and state regulatory agencies and land management agencies in and near GSENM for activities identified as having impacts on regional air quality, air quality related values (visibility and atmospheric deposition), and mitigation. |
| 9.      | <b>Management Direction:</b><br>No similar management direction.   | <b>Management Direction:</b><br>Work cooperatively with state, federal, and tribal entities to address regional air quality issues that are influenced or affected by the BLM land management actions.   |               |               | <b>Management Direction:</b><br>No similar management direction.   | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>Work cooperatively with state, federal, and tribal entities to address regional air quality issues that are influenced or affected by the BLM land management actions.   |

| Row No. | Alternative A  | Alternative B   | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan                                    | Alternative E 2024 Proposed RMP   |
|---------|--|---|---------------|---------------|--|--|---|
| -       | <b>AIR QUALITY</b>   |   |               |               | <b>Not for analysis. For comparison only.</b>  |  | -   |
| 10.     | <b>Management Direction:</b><br>Manage activities at least within air quality standards established by the EPA and Utah Division of Air Quality and no less than any local governments' air quality standards. |   |               |               | <b>Management Direction:</b><br>Manage activities at least within air quality standards established by the Environmental Protection Agency and Utah Division of Air Quality and no less than any local governments' air quality standards. (GSENM ROD 2020, KEPA ROD 2020) | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Manage activities at least within air quality standards established by the EPA and Utah Division of Air Quality and no less than any local governments' air quality standards |
| 11.     | <b>Management Direction:</b><br>No similar management direction.   | <b>Management Direction:</b><br>Manage all actions and programs to minimize the creation and transportation of dust.  |               |               | <b>Management Direction:</b><br>No similar management direction.   | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Manage all actions and programs to minimize the creation and transportation of dust.  |
| 12.     | <b>Management Direction:</b><br>No similar management direction.   | <b>Management Direction:</b><br>Ensure that prescribed burns conform with the Utah Smoke Management Plan, and they are timed to occur during meteorological conditions that maximize smoke dispersal. |               |               | <b>Management Direction:</b><br>No similar management direction.   | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Ensure that prescribed burns conform with the Utah Smoke Management Plan, and they are timed to occur during meteorological conditions that maximize smoke dispersal.         |

| Row No. | Alternative A  | Alternative B  | Alternative C | Alternative D   | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP  |
|---------|--|--|---------------|---|--|---|--|
| -       | <b>SOIL RESOURCES</b>  |  |               |   | <b>Not for analysis. For comparison only.</b>  |   | -  |
| 13.     | <b>Goal:</b><br>Manage uses to prevent damage to and degradation of soil resources and to ensure that soil health is maintained or improved.   | <b>Goal:</b><br>Protect and restore soil resources, including biological soil crusts, to prevent damage to and degradation of soil resources.  |               | <b>Goal:</b><br>Protect, maintain, enhance and/or restore soil resources.   | <b>Goal:</b><br>Manage uses to prevent damage to and degradation of soil resources and to ensure that soil health is maintained or improved. (GSENM ROD 2020, KEPA ROD 2020)   | <b>Goal:</b><br>Manage uses to prevent damage to soil resources and to ensure that the health and distribution of fragile biological soil crusts is maintained or improved. | <b>Goal:</b><br>Protect and restore soil resources to prevent damage to and degradation of soil resources.   |
| 14.     | <b>Objective:</b><br>Maintain, improve, and/or restore overall watershed health to reduce erosion, stream sedimentation, and salinization of water, with particular emphasis on the Colorado River System. |  |               |   | <b>Objective:</b><br>Maintain, improve, and/or restore overall watershed health to reduce erosion, stream sedimentation, and salinization of water, with particular emphasis on the Colorado River System. (GSENM ROD 2020, KEPA ROD 2020) | <b>Objective:</b><br>No similar objective.  | <b>Objective:</b><br>Protect and restore overall watershed health to reduce erosion, stream sedimentation, and salinization of water, with particular emphasis on the Colorado River System.       |
| 15.     | <b>Objective:</b><br>Ensure soils exhibit infiltration, permeability, and erosion rates appropriate for the soil type, climate, and landform.  | <b>Objective:</b><br>Protect and restore upland soils to meet BLM Utah Rangeland Health Standards (Standard I).  |               |   | <b>Objective:</b><br>Ensure soils exhibit infiltration, permeability, and erosion rates appropriate for the soil type, climate, and landform. (GSENM ROD 2020, KEPA ROD 2020)  | <b>Objective:</b><br>No similar objective.  | <b>Objective:</b><br>Protect soil resources consistent with the BLM Utah Rangeland Health Standards.   |
| 16.     | <b>Objective:</b><br>Maintain or enhance soil stability, productivity, and infiltration to prevent accelerated erosion and to provide for optimal plant growth and the site's potential.                   | <b>Objective:</b><br>Protect and restore soil health, productivity and stability, and infiltration to prevent erosion from disturbance and to provide for optimal plant growth and site potential. |               | <b>Objective:</b><br>Protect, maintain, enhance, and/or restore soil health, productivity and stability, and infiltration to prevent erosion from disturbance and to provide for optimal plant growth and site potential. | <b>Objective:</b><br>Maintain or enhance soil stability, productivity, and infiltration to prevent accelerated erosion and to provide for optimal plant growth and the site's potential. (GSENM ROD 2020, KEPA ROD 2020)                   | <b>Objective:</b><br>No similar objective.  | <b>Objective:</b><br>Protect and restore soil health, productivity and stability, and infiltration to prevent erosion from disturbance and to provide for optimal plant growth and site potential. |
| 17.     | <b>Objective:</b><br>Maintain, improve, and restore areas of biological soil crust appropriate for the soil type, climate, and landform.   |  |               |   | <b>Objective:</b><br>Maintain, improve, and restore areas of biological soil crust appropriate for the soil type, climate, and landform. (GSENM ROD 2020, KEPA ROD 2020)   | <b>Objective:</b><br>No similar objective.  | <b>Objective:</b><br>Protect and restore areas of biological soil crust appropriate for the soil type, climate, and landform.  |
| 18.     | <b>Objective:</b><br>Facilitate appropriate research to improve understanding and management of soil resources and biological soil crusts.   | <b>Objective:</b><br>Emphasize research that builds understanding and improves management of soil resources and biological soil crusts.  |               |   | <b>Objective:</b><br>Facilitate appropriate research to improve understanding and management of soil resources and biological soil crusts. (GSENM ROD 2020, KEPA ROD 2020)   | <b>Objective:</b><br>Same as Alternative A.   | <b>Objective:</b><br>Emphasize research that builds understanding and improves management of soil resources and biological soil crusts.  |

| Row No. | Alternative A  | Alternative B  | Alternative C | Alternative D  | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan                                    | Alternative E 2024 Proposed RMP  |
|---------|--|--|---------------|--|--|--|--|
| -       | <b>SOIL RESOURCES</b>  |  |               |  | <b>Not for analysis. For comparison only.</b>                    |  | -  |
| 19.     | <b>Objective:</b><br>No similar objective.                       | <b>Objective:</b><br>Manage soil resources consistent with ecological site groups (or other best approaches to identify soil types) and projections of climatic factors.   |               |  | <b>Objective:</b><br>No similar objective.                       | <b>Objective:</b><br>No similar objective.                       | <b>Objective:</b><br>Manage soil resources consistent with ecological site groups (or other best approaches to identify soil types) and projections of climatic factors.   |
| 20.     | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Within 2 years of the signing of the ROD, complete land health assessments and, if needed, causal factor determinations within the following watersheds: <ul style="list-style-type: none"> <li>• Upper Johnson Wash</li> <li>• Horse Canyon-Escalante River</li> <li>• Last Chance Creek</li> <li>• Upper Paria River</li> <li>• Hackberry Canyon-Cottonwood Creek</li> <li>• Middle Paria River</li> <li>• Upper Buckskin Gulch</li> <li>• Lower Deer Creek</li> <li>• Bear Creek-Boulder Creek</li> </ul> Based on the causal factor determination, and within 5 years of the signing of the ROD, take appropriate actions that will result in significant progress toward fulfillment of the land health standards.<br><br>Once the assessments/determinations have been completed in these priority watersheds and appropriate management actions taken to rectify issues, conduct land health assessments and, if needed, causal factor determinations, across GSENM, within 10 years of the signing of the ROD. |               | <b>Management Direction:</b><br>Within 10 years of the signing of the ROD, complete land health assessments and, if needed, causal factor determinations across GSENM. | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Within 2 years of the signing of the ROD, complete land health assessments and, if needed, causal factor determinations within the following watersheds: <ul style="list-style-type: none"> <li>• Upper Johnson Wash</li> <li>• Horse Canyon-Escalante River</li> <li>• Last Chance Creek</li> <li>• Upper Paria River</li> <li>• Hackberry Canyon-Cottonwood Creek</li> <li>• Middle Paria River</li> <li>• Upper Buckskin Gulch</li> <li>• Lower Deer Creek</li> <li>• Bear Creek-Boulder Creek</li> </ul> Based on the causal factor determination, and within 5 years of the signing of the ROD, take appropriate actions that will result in significant progress toward fulfillment of the land health standards.<br><br>Once the assessments/determinations have been completed in these priority watersheds and appropriate management actions taken to rectify issues, conduct land health assessments and, if needed, causal factor determinations, across GSENM, within 10 years of the signing of the ROD. |

| Row No. | Alternative A   | Alternative B   | Alternative C | Alternative D  | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP   |
|---------|---|---|---------------|--|---|--|---|
| -       | <b>SOIL RESOURCES</b>   |   |               |  | Not for analysis. For comparison only.  |  | -   |
| 21.     | <p><b>Management Direction:</b><br/>Lands managed under the GSENM RMP (2020) require measures to stabilize soils and minimize surface water runoff for slopes greater than 10 percent, both during project activities and following project completion.</p> <p>Lands managed under the KEPA RMP (2020) require measures to stabilize soils and minimize surface water runoff for slopes greater than 15 percent, both during project activities and following project completion.</p> | <p><b>Management Direction:</b><br/>Require measures to stabilize soils and minimize surface water runoff for actions on slopes greater than 10 percent.</p>  |               |  | <p><b>Management Direction:</b><br/>Require measures to stabilize soils and minimize surface water runoff for slopes greater than 10 percent, both during project activities and following project completion. (GSENM ROD 2020)</p> <p>Require measures to stabilize soils and minimize surface water runoff for slopes greater than 15 percent, both during project activities and following project completion. (KEPA ROD 2020)</p>     | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Require measures to stabilize soils and minimize surface water runoff for actions on slopes greater than 10 percent.</p>  |
| 22.     | <p><b>Management Direction:</b><br/>Prohibit surface-disturbing activities on slopes greater than 30 percent, with exceptions considered. Manage as a ROW avoidance area.</p>   | <p><b>Management Direction:</b><br/>Avoid soil-disturbing discretionary actions on slopes greater than 30 percent. Allow exceptions for scientific and research purposes as determined by the BLM Authorized Officer.</p> |               | <p><b>Management Direction:</b><br/>Prohibit soil-disturbing discretionary actions on slopes greater than 30 percent. Allow exceptions for scientific and research purposes as determined by the BLM Authorized Officer.</p> | <p><b>Management Direction:</b><br/>Prohibit surface-disturbing activities on slopes greater than 30 percent, with exceptions considered. Manage as a ROW avoidance area. (GSENM ROD 2020)</p> <p>Prohibit surface-disturbing activities on slopes greater than 30 percent, with exceptions considered. This includes a no surface occupancy stipulation, with exceptions considered. Manage as a ROW avoidance area. (KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Avoid soil-disturbing discretionary actions on slopes greater than 30 percent. Allow exceptions for scientific and research purposes as determined by the BLM Authorized Officer.</p> |

| Row No. | Alternative A  | Alternative B   | Alternative C  | Alternative D  | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP   |
|---------|--|---|--|--|--|--|---|
| -       | <b>SOIL RESOURCES</b>  |   |  |  | <b>Not for analysis. For comparison only.</b>  |  | -   |
| 23.     | <p><b>Management Direction:</b><br/>Prior to allowing surface disturbance in fragile or sensitive soil areas (such as saline soils, highly erosive, and late successional biological, expansive), operators may be required to submit a soil health and restoration plan that includes site-specific mitigation measures for activities proposed in fragile or sensitive soil areas. If required, the BLM must approve the plan before surface-disturbing activities are authorized. The BLM may allow surface disturbance in fragile or sensitive soil areas as long as impacts would be mitigated.</p> | <p><b>Management Direction:</b><br/>Avoid soil-disturbing actions on vulnerable soils, biological soil crusts, areas of soil vulnerability (such as erosion, mass movement, and potential loss of function), and in areas determined as having low restoration potential. Exceptions would be made for actions for purposes of land health restoration or where the action would not cause sustained degradation of soil resources.</p> <p>Livestock grazing is managed through allotment management plans, which consider the protection, maintenance, enhancement, and restoration of soil resources.</p> | <p><b>Management Direction:</b><br/><u>Front Country and Passage Areas:</u><br/>Same as Alternative B.</p> <p><u>Outback and Primitive Areas:</u><br/>Prohibit soil-disturbing actions on vulnerable, biological soil crusts, areas of soil vulnerability (such as erosion, mass movement, and potential loss of function), and in areas determined as having low restoration potential. Exceptions would be made for actions for purposes of land health restoration or where the action would not cause sustained degradation of soil resources.</p> <p>Livestock grazing is managed through allotment management plans, which consider the protection, maintenance, enhancement, and restoration of soil resources.</p> | <p><b>Management Direction:</b><br/>Prohibit soil-disturbing actions on vulnerable, biological soil crusts, areas of soil vulnerability (such as erosion, mass movement, and potential loss of function), and in areas determined as having low restoration potential. Exceptions would be made for actions for purposes of land health restoration.</p> <p>Livestock grazing is managed through allotment management plans, which consider the protection, maintenance, enhancement, and restoration of soil resources.</p> | <p><b>Management Direction:</b><br/>Prior to allowing surface disturbance in fragile or sensitive soil areas (such as saline soils, highly erosive, late successional biological, expansive), operators may be required to submit a soil health and restoration plan that includes site-specific mitigation measures for activities proposed in fragile or sensitive soil areas. If required, the BLM must approve the plan before surface-disturbing activities are authorized. The BLM may allow surface disturbance in fragile or sensitive soil areas as long as impacts would be mitigated. (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/><u>Front Country and Passage Areas:</u><br/>Avoid soil-disturbing actions on vulnerable soils, biological soil crusts, areas of soil vulnerability (such as erosion, mass movement, and potential loss of function), and in areas determined as having low restoration potential. Exceptions would be made for actions for purposes of land health restoration or where the action would not cause sustained degradation of soil resources.</p> <p><u>Outback and Primitive Areas:</u><br/>Prohibit soil-disturbing actions on vulnerable soils, biological soil crusts, areas of soil vulnerability (such as erosion, mass movement, and potential loss of function), and in areas determined as having low restoration potential. Exceptions would be made for actions for purposes of land health restoration or where the action would not cause sustained degradation of soil resources.</p> |

| Row No. | Alternative A   | Alternative B   | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan                                  | Alternative E 2024 Proposed RMP  |
|---------|---|---|---------------|---------------|---|--|--|
| -       | <b>SOIL RESOURCES</b>   |   |               |               | <b>Not for analysis. For comparison only.</b>   |  | -  |
| 24.     | <p><b>Management Direction:</b><br/>On lands managed under the GSENM RMP (2020), apply procedures to protect soils from accelerated or unnatural erosion in any ground-disturbing activity, including route maintenance and restoration. The effects of activities such as grazing developments, mineral exploration or development, or water developments will be analyzed through the preparation of project-specific NEPA documents. This process will include inventories for affected resources and the identification of mitigation measures.</p> <p>Prior to any ground-disturbing activity, the potential effects on biological soil crusts will be considered and steps will be taken to avoid impacts on their function, health, and distribution. Long-term research toward preservation and restoration of soils will be part of the adaptive management framework.</p> | <p><b>Management Direction:</b><br/>Prior to allowing soil-disturbing discretionary actions on vulnerable, biological soil crusts, and areas of soil vulnerability (such as erosion, mass movement, and potential loss of function), a soil health and restoration plan will be developed and approved. The plan will include site-specific mitigation that fully avoids, minimizes, and/or compensates for adverse effects on these soil resources. The plan will also include the following requirement: Soils and biological soil crusts will be properly removed, and remain either on-site or within GSENM, for use during reclamation, restoration, and/or scientific purposes.</p> |               |               | <p><b>Management Direction:</b><br/>Apply procedures to protect soils from accelerated or unnatural erosion in any ground-disturbing activity, including route maintenance and restoration. The effects of activities such as grazing developments, mineral exploration or development, or water developments will be analyzed through the preparation of project-specific NEPA documents. This process will include inventories for affected resources and the identification of mitigation measures.</p> <p>Prior to any ground-disturbing activity, the potential effects on biological soil crusts will be considered and steps will be taken to avoid impacts on their function, health, and distribution. Long-term research toward preservation and restoration of soils will be part of the adaptive management framework. (GSENM ROD 2020)</p> | <p><b>Management Direction:</b><br/>Same as Alternative A.</p> | <p><b>Management Direction:</b><br/>Prior to allowing soil-disturbing discretionary actions on biological soil crusts and areas of soil vulnerability (for example, erosion, mass movement, and potential loss of function), a soil health and restoration strategy would be developed and approved. The strategy would include site-specific restoration and/or protective measures that fully avoid, minimize, and/or compensate for adverse effects on these soil resources. The strategy would also include the following requirement: Soils and biological soil crusts would be properly removed and remain either on-site or within GSENM for use during reclamation, restoration, and/or scientific purposes.</p> |

| Row No. | Alternative A   | Alternative B  | Alternative C   | Alternative D   | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan              | Alternative E 2024 Proposed RMP  |
|---------|---|--|---|---|---|--|--|
| -       | <b>VEGETATION</b>   |  |   |   | <b>Not for analysis. For comparison only.</b>   |  | -  |
| 25.     | <b>Goal:</b><br>Ensure a mosaic of desired vegetation communities is present across the landscape with diversity of species, canopy, density, and age class in accordance with ecological site potential.   | <b>Goal:</b><br>Manage for a resistant, resilient mosaic of desired vegetation communities across the landscape with diversity of species, canopy, density, and age class in accordance with ecological site potential.  |   |   | <b>Goal:</b><br>Ensure a mosaic of desired vegetation communities is present across the landscape with diversity of species, canopy, density, and age class in accordance with ecological site potential. (GSENM ROD 2020, KEPA ROD 2020)   | <b>Goal:</b><br>No similar goal.           | <b>Goal:</b><br>Manage for a resistant, resilient mosaic of desired vegetation communities across the landscape with diversity of species, canopy, density, and age class in accordance with ecological site potential, with an emphasis on native species.  |
| 26.     | <b>Goal:</b><br>Protect, enhance, and/or restore ecological processes and functions.  | <b>Goal:</b><br>Protect and restore ecological processes and functions to increase climate resiliency through proactive vegetation management.   | <b>Goal:</b><br><u>Front Country, Passage, and Outback Areas:</u><br>Same as Alternative B.<br><br><u>Primitive Area:</u><br>Same as Alternative D. | <b>Goal:</b><br>Protect, maintain, enhance, and/or restore ecological processes and functions to increase climate resiliency, prioritizing natural processes and techniques over other methods.   | <b>Goal:</b><br>Protect, enhance, and/or restore ecological processes and functions. (GSENM ROD 2020, KEPA ROD 2020)  | <b>Goal:</b><br>No similar goal.           | <b>Goal:</b><br><u>Front Country, Passage, and Outback Areas:</u><br>Protect ecological processes and functions to increase climate resiliency through proactive vegetation management.<br><br><u>Primitive Area:</u><br>Protect and enhance ecological processes and functions to increase climate resiliency. Prioritize vegetation management and restoration that emphasizes natural processes and manual techniques over other methods. |
| 27.     | <b>Objective:</b><br>Manage sagebrush communities to provide quality habitat necessary to maintain sustainable populations of sagebrush-obligate species.<br><br>Manage undesirable and desirable vegetation with the goal of improving overall watershed conditions. | <b>Objective:</b><br>Protect and restore functional vegetation communities, including sagebrush communities, support watershed function, reduce fugitive dust, and provide quality habitat necessary to maintain sustainable wildlife populations, including sagebrush-obligate species. |   | <b>Objective:</b><br>Protect, maintain, enhance, and/or restore native functional vegetation communities, including sagebrush communities to support watershed function, and provide quality habitat necessary to maintain sustainable wildlife populations, including sagebrush-obligate species). | <b>Objective:</b><br>Manage sagebrush communities to provide quality habitat necessary to maintain sustainable populations of sagebrush-obligate species. (GSENM ROD 2020, KEPA ROD 2020)<br><br>Manage undesirable and desirable vegetation with the goal of improving overall watershed conditions. (GSENM ROD 2020, KEPA ROD 2020) | <b>Objective:</b><br>No similar objective. | <b>Objective:</b><br>Protect and restore functional vegetation communities, including sagebrush communities, support watershed function, reduce fugitive dust, and provide quality habitat necessary to maintain sustainable wildlife populations, including sagebrush-obligate species.   |
| 28.     | <b>Objective:</b><br>Restore native species to meet desired plant community objectives.   |  |   |   | <b>Objective:</b><br>Restore native species to meet desired plant community objectives. (GSENM ROD 2020, KEPA ROD 2020)   | <b>Objective:</b><br>No similar objective. | <b>Objective:</b><br>Restore native species to meet desired plant community objectives.  |



| Row No. | Alternative A   | Alternative B  | Alternative C | Alternative D  | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP   |
|---------|---|--|---------------|--|--|---|---|
| -       | <b>VEGETATION</b>   |  |               |  | <b>Not for analysis. For comparison only.</b>  |   | -   |
| 29.     | <b>Objective:</b><br>Maintain healthy stands of ponderosa pine.   | <b>Objective:</b><br>No similar objective ( <i>this is covered by the overall objective for functional vegetation communities</i> ).   |               |  | <b>Objective:</b><br>Maintain healthy stands of ponderosa pine. (GSENM ROD 2020, KEPA ROD 2020)  | <b>Objective:</b><br>No similar objective.  | <b>Objective:</b><br>No similar objective.  |
| 30.     | <b>Objective:</b><br>Maintain and/or restore riparian areas to proper functioning condition (PFC), or making significant progress toward PFC, where BLM-managed or BLM-authorized activities have been identified as contributing to riparian impairment. | <b>Objective:</b><br>Protect and restore riparian areas to PFC.  |               | <b>Objective:</b><br>Protect, maintain, enhance, and/or restore riparian areas to PFC.   | <b>Objective:</b><br>Maintain and/or restore riparian areas to proper functioning condition (PFC), or making significant progress toward proper functioning condition, where BLM-managed or BLM-authorized activities have been identified as contributing to riparian impairment. (GSENM ROD 2020, KEPA ROD 2020) | <b>Objective:</b><br>Monitoring of riparian resource conditions will be established to determine when actions should be taken to ensure movement toward PFC on all riparian stream segments in the Monument.  | <b>Objective:</b><br>Protect and restore riparian areas to PFC.   |
| 31.     | <b>Objective:</b><br>Ensure water quantity and quality for multiple-use management, consistent with the protection of GSENM objects and functioning, healthy riparian and upland systems.   | <b>Objective:</b><br>Proactively manage uplands, riparian areas, and waterways to protect and restore water quantity and quality.  |               | <b>Objective:</b><br>Proactively manage uplands, riparian areas, and waterways to protect, maintain, enhance, and restore water quantity and quality.  | <b>Objective:</b><br>Ensure water quantity and quality for multiple-use management and functioning, healthy riparian and upland systems. (GSENM ROD 2020, KEPA ROD 2020)   | <b>Objective:</b><br>The information in the Water section describes a strategy for assuring water availability. Under that strategy, priority will be to maintain natural flows and flood events. In addition, the maintenance of instream flows will provide adequate water for natural structure and function of riparian vegetation. | <b>Objective:</b><br>Proactively manage uplands, riparian areas, and waterways to protect and restore water quantity and quality.   |
| 32.     | <b>Objective:</b><br>Manage relict plant communities and hanging gardens to maintain and enhance biological diversity.  | <b>Objective:</b><br>Manage reference plant communities to protect and restore biological diversity.   |               | <b>Objective:</b><br>Manage reference plant communities to protect, maintain, enhance, and restore biological diversity.   | <b>Objective:</b><br>Manage relict plant communities and hanging gardens to maintain and enhance biological diversity. (GSENM ROD 2020, KEPA ROD 2020)   | <b>Objective:</b><br>Protect unique vegetation associations such as hanging gardens and relict plant associations.  | <b>Objective:</b><br>Manage reference plant communities to protect and enhance or restore biological diversity.   |
| 33.     | <b>Objective:</b><br>Create and maintain a mosaic of noninvasive perennial and annual vegetation communities across the landscape with diversity of species, canopy, density, and different stages of growth.   | <b>Objective:</b><br>Protect and restore a mosaic of noninvasive perennial and annual vegetation communities across the landscape with diversity of species, canopy, density, and different stages of composition. |               | <b>Objective:</b><br>Protect, maintain, enhance, and/or restore a mosaic of native perennial and annual vegetation communities across the landscape with diversity of species, canopy, density, and different stages of composition. | <b>Objective:</b><br>Create and maintain a mosaic of noninvasive perennial and annual vegetation communities across the landscape with diversity of species, canopy, density, and different stages of growth. (GSENM ROD 2020, KEPA ROD 2020)  | <b>Objective:</b><br>No similar objective.  | <b>Objective:</b><br>Protect and restore a mosaic of native perennial and annual vegetation communities across the landscape with diversity of species, canopy, density, and different stages of composition. |

| Row No. | Alternative A  | Alternative B   | Alternative C | Alternative D  | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP  |
|---------|--|---|---------------|--|--|--|--|
| -       | <b>VEGETATION</b>  |   |               |  | <b>Not for analysis. For comparison only.</b>                            |  | -  |
| 34.     | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Within 2 years of the signing of the ROD, complete land health assessments and, if needed, causal factor determinations within the following watersheds:</p> <ul style="list-style-type: none"> <li>• Upper Johnson Wash</li> <li>• Horse Canyon-Escalante River</li> <li>• Last Chance Creek</li> <li>• Upper Paria</li> <li>• Hackberry Canyon-Cottonwood Creek</li> <li>• Middle Paria</li> <li>• Upper Buckskin Gulch</li> <li>• Lower Deer Creek</li> <li>• Bear Creek-Boulder Creek</li> </ul> <p>Based on the causal factor determination, and within 5 years of the signing of the ROD, take appropriate actions that will result in significant progress toward fulfillment of the land health standards.</p> <p>Once the assessments/determinations have been completed in these priority watersheds and appropriate management actions taken to rectify issues, conduct land health assessments and, if needed, causal factor determinations, across GSENM, within 10 years of the signing of the ROD.</p> |               | <p><b>Management Direction:</b><br/>Within 10 years of the signing of the ROD, complete land health assessments and, if needed, causal factor determinations across GSENM.</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Within 2 years of the signing of the ROD, complete land health assessments and, if needed, causal factor determinations within the following watersheds:</p> <ul style="list-style-type: none"> <li>• Upper Johnson Wash</li> <li>• Horse Canyon-Escalante River</li> <li>• Last Chance Creek</li> <li>• Upper Paria</li> <li>• Hackberry Canyon-Cottonwood Creek</li> <li>• Middle Paria</li> <li>• Upper Buckskin Gulch</li> <li>• Lower Deer Creek</li> <li>• Bear Creek-Boulder Creek</li> </ul> <p>Based on the causal factor determination, and within 5 years of the signing of the ROD, take appropriate actions that would result in significant progress toward fulfillment of the land health standards.</p> <p>Once the assessments/determinations have been completed in these priority watersheds and appropriate management actions taken to rectify issues, conduct land health assessments and, if needed, causal factor determinations, across GSENM, within 10 years of the signing of the ROD.</p> |

| Row No. | Alternative A   | Alternative B   | Alternative C | Alternative D   | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan                                    | Alternative E 2024 Proposed RMP  |
|---------|---|---|---------------|---|---|--|--|
| -       | <b>VEGETATION</b>   |   |               |   | <b>Not for analysis. For comparison only.</b>   |  | -  |
| 35.     | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>Use soil and biological soil crust resource conditions, desired conditions mapping, and hydrologic conditions and trends information, as available, as a basis in design and rationale for vegetation management proposals. |               |   | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>The BLM will use best available information, which may include but is not limited to, soil and biological soil crust resource conditions, various types of conditions mapping, and hydrologic conditions and trends information, as a basis in design and rationale for vegetation management proposals. |
| 36.     | <b>Management Direction:</b><br>Use the full range of vegetation treatment methods and tools (such as chaining, prescribed fire, mechanical, chemical, biological, and woodland product removal).<br>Prioritize treatments in areas where removal of woodland products would improve rangeland health, wildlife habitat, and forage.<br>This decision also applies to nonstructural range improvements. | <b>Management Direction:</b><br>Implement landscape-scale ecosystem restoration projects to restore functional vegetation communities.  |               | <b>Management Direction:</b><br>Implement landscape-scale ecosystem restoration projects to restore native functional vegetation communities, with a prioritization of natural processes and techniques over other methods. | <b>Management Direction:</b><br>Use the full range of vegetation treatment methods and tools (such as chaining, prescribed fire, mechanical, chemical, biological, woodland product removal).<br>Prioritize treatments in areas where removal of woodland products would improve rangeland health, wildlife habitat, and forage.<br>This decision would also apply to nonstructural range improvements. (GSENM ROD 2020, KEPA ROD 2020) | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Implement landscape-scale ecosystem restoration projects to restore functional vegetation communities.   |

| Row No. | Alternative A  | Alternative B  | Alternative C | Alternative D  | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP   |
|---------|--|--|---------------|--|--|--|---|
| -       | <b>VEGETATION</b>  |  |               |  | <b>Not for analysis. For comparison only.</b>                            |  | -   |
| 37.     | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>For all vegetation management efforts, maximize potential for lasting resilient restoration through the preferential use of native vegetation. Nonnative vegetation may be used in restoration efforts as consistent with project and site-specific consideration and rationale, to best support recovery of site integrity and <b>resiliency</b>. Use adaptive management to ensure that health of these efforts is maintained.</p> |               | <p><b>Management Direction:</b><br/>For all vegetation management efforts, manage for the restoration and/or persistence of resistant and resilient landscapes through the use of only native vegetation. However, the use of nonnative vegetation may be approved in phased restoration efforts that lead <b>toward</b> a native vegetation community or for emergency actions where native vegetation is not reasonably available. Use adaptive management to ensure that health of these efforts is maintained.</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>In keeping with the overall vegetation objectives [that is, increase public education and appreciation of vegetation through interpretation, facilitate appropriate research to improve understanding and management of vegetation, and protect unique vegetation associations such as hanging gardens and relict plant associations] and Presidential Executive Order 11312, native plants will be used as a priority for all projects in the Monument.</p> <p>Nonnative plants may be used in limited, emergency situations where they may be necessary in order to protect Monument resources by stabilizing soils and displacing noxious weeds. This use will be allowed to the extent that it complies with the vegetation objectives, Presidential Executive Order 11312, and the Standards for Rangeland Health and Guidelines for Grazing Management for BLM Lands in Utah (1997). In these situations, short-lived species (that is, nurse crop species) will be used and will be combined with native species to facilitate the ultimate establishment of native species.</p> <p>Nonnative plants may be used for restoration related research if the use is consistent with and furthers the overall vegetation management objectives, including [the objective] above, and after consultation with the GSENM Advisory Committee.</p> | <p><b>Management Direction:</b><br/>For all vegetation management efforts, maximize the potential for lasting resilient restoration through the preferential use of native vegetation. Nonnative vegetation may be used in restoration efforts as consistent with project and site-specific consideration and rationale, to best support recovery of site integrity and <b>resiliency</b>. Use adaptive management to ensure that health of these vegetation communities is maintained.</p> |

| Row No. | Alternative A  | Alternative B   | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP   |
|---------|--|---|---------------|---------------|---|---|---|
| -       | <b>VEGETATION</b>  |   |               |               | <b>Not for analysis. For comparison only.</b>   |   | -   |
| 38.     | <p><b>Management Direction:</b><br/>After surface disturbance, manage livestock grazing practices until seedings are established to promote the survival of plants. Generally, areas will be rested from livestock grazing for two growing seasons or until site objectives are met. Vegetation treatment monitoring data will be evaluated to determine when objectives for the seedings are met, and grazing can be resumed.</p> | <p><b>Management Direction:</b><br/>After vegetation management activities involving seeding (such as fire rehabilitation, restoration, and nonstructural range improvement), manage livestock grazing practices until seedings are established to promote the survival of plants. Areas will be rested for a minimum of two growing seasons and until site objectives are met. Vegetation monitoring data will be evaluated to determine when objectives for the seedings are met and when grazing can be resumed.</p> |               |               | <p><b>Management Direction:</b><br/>After surface disturbance, manage livestock grazing practices until seedings are established in order to promote the survival of plants. Generally, areas will be rested from livestock grazing for two growing seasons or until site objectives are met. Vegetation treatment monitoring data will be evaluated to determine when objectives for the seedings are met, and grazing can be resumed. (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>Livestock grazing after native seedings are established will be modified to ensure the survival of the native plants. The livestock exclusion period required to allow full establishment of seeded native species and recovery of surviving native plants after a wildfire may be more than 2 years. Site evaluation will be required to determine when the native seedings should be grazed again and the effectiveness of the current or new grazing system on the persistence of native plants.</p>   | <p><b>Management Direction:</b><br/>After vegetation management activities involving seeding (such as fire rehabilitation, restoration, and nonstructural range improvement), manage livestock grazing practices until seedings are established to promote the survival of plants. Areas would be rested for a minimum of two growing seasons and until site objectives are met. Vegetation monitoring data would be evaluated to determine when objectives for the seedings are met and when grazing can be resumed.</p> |
| 39.     | <p><b>Management Direction:</b><br/>Prohibit vegetation restoration methods in relict plant communities and hanging gardens, unless needed for removal of noxious weed species. Prohibit camping, overnight stays, and campfires in relict plant communities and hanging gardens. Make exceptions for scientific and research purposes as determined by the BLM Authorized Officer.</p>  | <p><b>Management Direction:</b><br/>Prohibit discretionary actions in reference plant communities, unless needed for removal of invasive weed species threatening intact communities, or to ensure biological integrity of these communities.</p>   |               |               | <p><b>Management Direction:</b><br/>Prohibit vegetation restoration methods in relict plant communities and hanging gardens, unless needed for removal of noxious weed species. (GSENM ROD 2020)</p> <p>Prohibit camping, overnight stays, and campfires in relict plant communities and hanging gardens. Make exceptions for scientific and research purposes as determined by the authorized officer (GSENM ROD 2020).</p>  | <p><b>Management Direction:</b><br/>Vegetation restoration methods (that is, mechanical methods, use of machinery [such as roller chopping, chaining, plowing, and discing], chemical methods, biological control, management-ignited fire) will not be allowed in these areas, unless needed for removal of noxious weed species. In these circumstances, consultation with the GSENM Advisory Committee will be used to determine the most appropriate control methods to ensure proper protection.</p> <p>Camping, overnight stays, and campfires in these areas will not be allowed (that is, in relict plant communities and hanging gardens).</p> | <p><b>Management Direction:</b><br/>Prohibit discretionary actions in reference plant communities, unless needed for removal of invasive weed species threatening intact communities, or to ensure biological integrity of these communities.</p>   |

| Row No. | Alternative A  | Alternative B  | Alternative C   | Alternative D   | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP  |
|---------|--|--|---|---|---|---|--|
| -       | <b>VEGETATION</b>  |  |   |   | <b>Not for analysis. For comparison only.</b>   |   | -  |
| 40.     | <p><b>Management Direction:</b><br/>Avoid new surface-disturbing activities within 330 feet of riparian/wetland areas unless it could be shown that (1) there are no practical alternatives (such as a designated utility corridor), (2) all long-term impacts could be fully mitigated, or (3) the activity would benefit and enhance the riparian area. Apply ROW avoidance.</p> | <p><b>Management Direction:</b><br/>Avoid new discretionary actions within 330 feet of riparian/wetland areas unless topographic boundaries limit the distance, and the action will result in no adverse impact on riparian/wetland areas.</p> | <p><b>Management Direction:</b><br/><u>Front Country, Passage, and Outback Areas:</u><br/>Same as Alternative B.</p> <p><u>Primitive Area:</u><br/>Same as Alternative D.</p> | <p><b>Management Direction:</b><br/>Avoid new discretionary actions within 330 feet of riparian/wetland areas unless topographic boundaries limit the distance, and the action will enhance riparian/wetland areas.</p> | <p><b>Management Direction:</b><br/>Avoid new surface-disturbing activities within 330 feet of riparian/wetland areas unless it could be shown that (1) there are no practical alternatives (such as a designated utility corridor), (2) all long-term impacts could be fully mitigated, or (3) the activity would benefit and enhance the riparian area. Apply controlled surface use on federal mineral leasing and ROWs avoidance. (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p>  | <p><b>Management Direction:</b><br/><u>Front Country, Passage, and Outback Areas:</u><br/>Avoid new discretionary actions within 330 feet of riparian/wetland areas (except when topographic boundaries limit the distance) unless the action would be consistent with the protection of riparian/wetland areas.</p> <p><u>Primitive Area:</u><br/>Avoid new discretionary actions within 330 feet of riparian/wetland areas (except when topographic boundaries limit the distance) unless the action would protect and enhance riparian/wetland areas.</p> |
| 41.     | <p><b>Management Direction:</b><br/>Allow surface-disturbing research in relict plant communities if the research is designed to promote the overall health and understanding of these areas.</p>  | <p><b>Management Direction:</b><br/>Prohibit discretionary actions within riparian communities associated with hanging gardens, with the exception of actions that protect the hanging gardens.</p>  |   |   | <p><b>Management Direction:</b><br/>Allow surface-disturbing research in relict plant communities if the research is designed to promote the overall health and understanding of these areas. (GSENM ROD 2020)</p> <p>Allow surface-disturbing research in relict plant communities and hanging gardens with implementation of vegetation BMPs. (KEPA ROD 2020)</p>   | <p><b>Management Direction:</b><br/>Protect unique vegetation associations such as hanging gardens and relict plant associations. Surface-disturbing research will not be allowed in these areas (that is, relict plant communities and hanging gardens).</p> | <p><b>Management Direction:</b><br/>Prohibit discretionary actions within riparian communities associated with hanging gardens, unless the action would protect the hanging gardens.</p>   |
| 42.     | <p><b>Management Direction:</b><br/>Prevent establishment of new invasive species through early detection and rapid response actions.</p>  | <p><b>Management Direction:</b><br/>Prevent the establishment of invasive species and control the spread of established invasive species through early detection and rapid response actions.</p>   |   |   | <p><b>Management Direction:</b><br/>Prevent establishment of new invasive species through early detection and rapid response actions. (GSENM ROD 2020, KEPA ROD 2020)</p>   | <p><b>Management Direction:</b><br/>For major removal projects, monitoring plots will be established in key areas to determine effectiveness of methods and presence of noxious weed species.</p>   | <p><b>Management Direction:</b><br/>Prevent the establishment of invasive species and control the spread of established invasive species through early detection and rapid response actions.</p>   |

| Row No. | Alternative A  | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP  |
|---------|--|--|---------------|---------------|--|--|--|
| -       | <b>VEGETATION</b>  |  |               |               | <b>Not for analysis. For comparison only.</b>  |  | -  |
| 43.     | <p><b>Management Direction:</b><br/>Control noxious weed species and prevent the introduction of new invasive species in conjunction with Cooperative Weed Management Areas.</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> |               |               | <p><b>Management Direction:</b><br/>Control noxious weed species and prevent the introduction of new invasive species in conjunction with Cooperative Weed Management Areas. (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>The BLM will control noxious weeds in accordance with National and State policies and directives. Control of noxious weeds is also a priority to achieve the overall vegetation objectives stated above (that is, increase public education and appreciation of vegetation through interpretation, facilitate appropriate research to improve understanding and management of vegetation, and protect unique vegetation associations such as hanging gardens and relict plant associations).</p> <p>Projects will be designed in conjunction with Kane and Garfield Counties and adjacent Forest Service and NPS staffs. With this strategy the BLM hopes to control noxious weed species and prevent introduction of new invasive species into the Monument and surrounding ecosystems.</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> |

| Row No. | Alternative A   | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP  |
|---------|---|--|---------------|---------------|---|--|--|
| -       | <b>VEGETATION</b>   |  |               |               | <b>Not for analysis. For comparison only.</b>   |  | -  |
| 44.     | <p><b>Management Direction:</b><br/>Allow approved weed-control methods to all invasive species in an integrated weed management program (including, but not limited to, preventive management; education; and mechanical, biological, wildland or prescribed fire, and chemical techniques).</p> | <p><b>Management Direction:</b><br/>Implement an integrated weed management program to control weeds using methods appropriate to each site.</p>   |               |               | <p><b>Management Direction:</b><br/>Allow approved weed-control methods to all invasive species in an integrated weed management program (including but not limited to preventive management; education; and mechanical, biological, wildland or prescribed fire, and chemical techniques). (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Implement an integrated weed management plan to control weeds using methods appropriate to each site. Until such plan is completed, implement weed management to protect GSENM objects and resources through attention to treatment of:</p> <ul style="list-style-type: none"> <li>• Weed populations with known potential for affecting areas with high naturalness</li> <li>• New infestations of weeds with high resistance to treatment</li> <li>• Weeds with a potential for affecting special status plant and animal species and their habitat (for example, Scotch thistle in sage-grouse priority habitat management area)</li> </ul> |
| 45.     | <p><b>Management Direction:</b><br/>Allow the sale of forest treatment residues as secondary wood products or biomass.</p>  | <p><b>Management Direction:</b><br/>Make vegetation management residues (such as wood and other timber products left over after projects) for collection and removal only when this optimizes restoration of ecosystem health. Prioritize the use of residues on-site or for other GSENM restoration activities whenever there is opportunity.</p> |               |               | <p><b>Management Direction:</b><br/>Allow the sale of forest treatment residues as secondary wood products or biomass (GSENM ROD 2020, KEPA ROD 2020).</p>  | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>With respect to vegetation residues (such as wood and other timber products left over after projects), the BLM may, consistent with the protection of GSENM objects:</p> <ul style="list-style-type: none"> <li>• Leave the residues on-site for restoration processes.</li> <li>• Allow for collection and removal, in accordance with applicable law.</li> <li>• Use residues on GSENM for other restoration activities.</li> </ul>  |



| Row No. | Alternative A  | Alternative B  | Alternative C | Alternative D   | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP  |
|---------|--|--|---------------|---|---|---|--|
| -       | <b>WATER RESOURCES</b>   |  |               |   | <b>Not for analysis. For comparison only.</b>   |   | -  |
| 46.     | <b>Goal:</b><br>Ensure that appropriate quality and quantity of water resources are available for the proper care and management of GSENM objects.                             | <b>Goal:</b><br>Protect and restore the quality and quantity of water resources.   |               | <b>Goal:</b><br>Protect, maintain, enhance and/or restore the quality and quantity of water resources.  | <b>Goal:</b><br>Ensure that appropriate quality and quantity of water resources are available for the proper care and management of objects of GSENM and resources of GSENM. (GSENM ROD 2020)<br><br>Ensure that appropriate quality and quantity of water resources are available for resources of KEPA. (KEPA ROD 2020) | <b>Goal:</b><br>Ensure that appropriate quality and quantity of water resources are available for the proper care and management of the objects of the Monument.  | <b>Goal:</b><br>Protect and restore the quality and quantity of water resources.   |
| 47.     | <b>Objective:</b><br>No similar objective.   | <b>Objective:</b><br>Manage aquatic habitat and water uses to help increase climate resiliency in consideration of expected changes in water availability. |               |   | <b>Objective:</b><br>No similar objective.  | <b>Objective:</b><br>No similar objective.  | <b>Objective:</b><br>Manage aquatic habitat and water uses to help increase climate resiliency in consideration of expected changes in water availability. |
| 48.     | <b>Objective:</b><br>Maintain, enhance, and/or restore natural hydrologic functions of watersheds, including the capability to capture, store, and beneficially release water. | <b>Objective:</b><br>Protect and restore natural hydrologic functions of watersheds to meet BLM Utah Rangeland Health Standards (Standard 2).              |               | <b>Objective:</b><br>Protect, maintain, enhance, and/or restore natural hydrologic function of watersheds to meet BLM Utah Rangeland Health Standards (Standard 2). | <b>Objective:</b><br>Maintain, enhance, and/or restore natural hydrologic functions of watersheds, including the capability to capture, store, and beneficially release water. (GSENM ROD 2020, KEPA ROD 2020)  | <b>Objective:</b><br>Ensure that land management policies protect water resources. Since much of the water important to the Monument falls as precipitation within the Monument, its continued availability can be ensured by appropriate land management policies within the Monument. The BLM will exercise its existing land management authorities to protect and maintain all available water and natural flows in the Monument. Several decisions described in other sections of this Plan are designed to meet this objective. | <b>Objective:</b><br>Protect and restore natural hydrologic functions of watersheds to meet BLM Utah Rangeland Health Standards.                           |

| Row No. | Alternative A   | Alternative B  | Alternative C   | Alternative D   | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP  |
|---------|---|--|---|---|--|---|--|
| -       | <b>WATER RESOURCES</b>  |  |   |   | <b>Not for analysis. For comparison only.</b>  |   | -  |
| 49.     | <b>Objective:</b><br>Improve watershed conditions on eroding sites and on other sensitive watershed areas, such as riparian areas.            | <b>Objective:</b><br>Protect and restore watershed hydrologic conditions (such as minimizing sheet and rill erosion and increasing infiltration rate) in sensitive or impaired watersheds, and riparian areas. | <b>Objective:</b><br>Protect, maintain, enhance and/or restore watershed hydrologic conditions (such as minimizing sheet and rill erosion and increasing infiltration rate) in sensitive or impaired watersheds and riparian areas. | <b>Objective:</b><br>Protect, maintain, enhance and/or restore watershed hydrologic conditions (such as minimizing sheet and rill erosion and increasing infiltration rate) in sensitive or impaired watersheds and riparian areas. | <b>Objective:</b><br>Improve watershed conditions on eroding sites and on other sensitive watershed areas, such as riparian areas. (GSENM ROD 2020, KEPA ROD 2020)                           | <b>Objective:</b><br>No similar objective.  | <b>Objective:</b><br>Protect and restore watershed hydrologic conditions (such as minimizing sheet and rill erosion and increasing infiltration rate) in sensitive or impaired watersheds, and riparian areas. |
| 50.     | <b>Objective:</b><br>Maintain and/or improve water quality to meet state water quality standards and the BLM Utah Rangeland Health Standards. | <b>Objective:</b><br>Protect and restore water quality to meet State of Utah water quality standards and the BLM Utah Rangeland Health Standards (Standard 4).   | <b>Objective:</b><br>Protect, maintain, enhance and/or restore water quality to meet state water quality standards and the BLM Utah Rangeland Health Standards (Standard 4).  | <b>Objective:</b><br>Protect, maintain, enhance and/or restore water quality to meet state water quality standards and the BLM Utah Rangeland Health Standards (Standard 4).  | <b>Objective:</b><br>Maintain and/or improve water quality to meet State water quality standards and the Utah Standards and Guidelines for Rangeland Health. (GSENM ROD 2020, KEPA ROD 2020) | <b>Objective:</b><br>The BLM will continue to work with Utah Department of Environmental Quality, Division of Water Quality (UDWQ) as water quality improvement programs and total maximum daily loads are developed. | <b>Objective:</b><br>Protect and restore water quality to meet State of Utah water quality standards and the BLM Utah Rangeland Health Standards.  |

| Row No. | Alternative A                                      | Alternative B   | Alternative C | Alternative D  | 2020 GSENM and KEPA RMPs                           | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP   |
|---------|--|---|---------------|--|--|--|---|
| -       | <b>WATER RESOURCES</b>                             |   |               |  | <b>Not for analysis. For comparison only.</b>      |  | -   |
| 51.     | <p><b>Objective:</b><br/>No similar objective.</p> | <p><b>Objective:</b><br/>Protect and restore available surface and groundwater into and out of GSENM. Prioritize the maintenance of natural flows and flood events.</p> |               | <p><b>Objective:</b><br/>Protect, maintain, enhance, and/or restore available surface and ground water into and out of GSENM.</p>                                  | <p><b>Objective:</b><br/>No similar objective.</p> | <p><b>Objective:</b><br/>Monitor to ensure water flowing into the Monument is adequate to support Monument resources. The purpose of the above measures is to protect water that originates in the Monument or water after it enters the Monument boundary. While these measures are currently considered adequate to ensure the continued availability of water to support Monument resources, the BLM will also assess whether the water flows coming into the Monument continue to be adequate. This will be part of an overall strategy to assess the status of water resources within the Monument.</p> <p>The BLM will work with the Water Resources Division of the U.S. Geological Survey, the Utah Department of Natural Resources, and others to gather comprehensive information concerning precipitation, surface water flows, and subsurface water flows into and out of the Monument. This could include establishing additional stream-gauging stations at selected locations, and continued inventorying of water sources such as seeps, springs, and wells.</p> | <p><b>Objective:</b><br/>Protect and restore available surface and groundwater into and out of GSENM. Prioritize the maintenance of natural flows and flood events.</p> |
| 52.     | <p><b>Objective:</b><br/>No similar objective.</p> | <p><b>Objective:</b><br/>Protect and restore surface and groundwater quality and conditions to avoid outbreaks of harmful algal blooms.</p>                             |               | <p><b>Objective:</b><br/>Protect, maintain, enhance, and/or restore surface and groundwater quality and conditions to avoid outbreaks of harmful algal blooms.</p> | <p><b>Objective:</b><br/>No similar objective.</p> | <p><b>Objective:</b><br/>No similar objective.</p>   | <p><b>Objective:</b><br/>Protect and restore surface and groundwater quality and conditions to avoid outbreaks of harmful algal blooms.</p>                             |

| Row No. | Alternative A  | Alternative B  | Alternative C | Alternative D  | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP   |
|---------|--|--|---------------|--|--|--|---|
| -       | <b>WATER RESOURCES</b>   |  |               |  | <b>Not for analysis. For comparison only.</b>                            |  | -   |
| 53.     | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Within 2 years of the signing of the ROD, complete land health assessments and, if needed, causal factor determinations within the following watersheds:</p> <ul style="list-style-type: none"> <li>• Upper Johnson Wash</li> <li>• Horse Canyon-Escalante River</li> <li>• Last Chance Creek</li> <li>• Upper Paria</li> <li>• Hackberry Canyon-Cottonwood Creek</li> <li>• Middle Paria</li> <li>• Upper Buckskin Gulch</li> <li>• Lower Deer Creek</li> <li>• Bear Creek-Boulder Creek</li> </ul> <p>Based on the causal factor determination, and within 5 years of the signing of the ROD, take appropriate actions that will result in significant progress toward fulfillment of the land health standards.</p> <p>Once the assessments/determinations have been completed in these priority watersheds and appropriate management actions taken to rectify issues, conduct land health assessments and, if needed causal factor determinations, across GSENM, within 10 years of the signing of the ROD.</p> |               | <p><b>Management Direction:</b><br/>Within 10 years of the signing of the ROD, complete land health assessments and, if needed, causal factor determinations across GSENM.</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Within 2 years of the signing of the ROD, complete land health assessments and, if needed, causal factor determinations within the following watersheds:</p> <ul style="list-style-type: none"> <li>• Upper Johnson Wash</li> <li>• Horse Canyon-Escalante River</li> <li>• Last Chance Creek</li> <li>• Upper Paria</li> <li>• Hackberry Canyon-Cottonwood Creek</li> <li>• Middle Paria</li> <li>• Upper Buckskin Gulch</li> <li>• Lower Deer Creek</li> <li>• Bear Creek-Boulder Creek</li> </ul> <p>Based on the causal factor determination, and within 5 years of the signing of the ROD, take appropriate actions that would result in significant progress toward fulfillment of the land health standards.</p> <p>Once the assessments/determinations have been completed in these priority watersheds and appropriate management actions taken to rectify issues, conduct land health assessments and, if needed causal factor determinations, across GSENM, within 10 years of the signing of the ROD.</p> |
| 54.     | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Consider hydrological function (at the 12th HUC scale) when designing landscape-scale vegetation management actions and design projects to protect hydrologic function.</p>  |               |  | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Consider hydrological function (at the 12th HUC scale) when designing landscape-scale vegetation management actions and design projects to protect hydrologic function.</p>   |

| Row No. | Alternative A  | Alternative B   | Alternative C   | Alternative D  | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP   |
|---------|--|---|---|--|---|---|---|
| -       | <b>WATER RESOURCES</b>   |   |   |  | <b>Not for analysis. For comparison only.</b>   |   | -   |
| 55.     | <b>Management Direction:</b><br>No similar management direction.   | <b>Management Direction:</b><br>Mitigate impacts on water quality from discretionary actions by implementing minimization or avoidance techniques, to restore impaired waters listed in the most recent State 305b Water Quality Report.  |   |  | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>Mitigate impacts on water quality from discretionary actions by implementing minimization or avoidance techniques, to restore impaired waters listed in the most recent State 305b Water Quality Report.                  |
| 56.     | <b>Management Direction:</b><br>No similar management direction.   | <b>Management Direction:</b><br>Do not authorize activities that will contribute to the listing of waterbodies as impaired under Clean Water Act Section 303(d) or that will lead to further degradation of waterbodies listed as impaired.   |   |  | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>Prohibit discretionary actions that would directly contribute to the listing of waterbodies as impaired under Clean Water Act Section 303(d) or that would lead to further degradation of waterbodies listed as impaired. |
| 57.     | <b>Management Direction:</b><br>To protect and maintain water and natural flows, including water flowing into GSENM from adjacent lands, the BLM will (1) exercise its existing land management authorities to protect and maintain available water and natural flows into and out of GSENM and (2) encourage the development of major visitor centers and facilities in nearby communities. | <b>Management Direction:</b><br>Prevent the loss of water (surface and ground) quantities in GSENM through proactive management actions and by ensuring discretionary actions minimize water use.<br><br>Implement actions to protect and restore the availability of surface water and groundwater within GSENM. | <b>Management Direction:</b><br>Prevent the loss of water (surface and ground) quantities in GSENM through proactive management actions and by ensuring discretionary actions would not cause a net loss of water quantity in the applicable watershed or aquifer.<br><br>Implement actions to protect, maintain, enhance and/or restore the availability of surface water and groundwater within GSENM, without the development of additional human-made infrastructure. | <b>Management Direction:</b><br>To protect and maintain water and natural flows, including water flowing into GSENM from adjacent lands, the BLM will (1) exercise its existing land management authorities to protect and maintain available water and natural flows into and out of GSENM, and (2) encourage the development of major visitor centers and facilities in nearby communities. (GSENM ROD 2020)<br><br>To protect and maintain water and natural flows, including water flowing into KEPA from adjacent lands, the BLM will exercise its existing land management authorities to protect and maintain available water and natural flows into and out of KEPA. (KEPA ROD 2020) | <b>Management Direction:</b><br>Ensure that land management policies protect water resources. Since much of the water important to the Monument falls as precipitation within the Monument, its continued availability can be ensured by appropriate land management policies within the Monument.<br><br>Major visitor centers and facilities will be located outside of the Monument in local communities where there will be access to municipal water systems.<br><br>The BLM will exercise its existing land management authorities to protect and maintain all available water and natural flows in the Monument. | <b>Management Direction:</b><br>Prevent the loss of water (surface and ground) quantities in GSENM through proactive management actions and by ensuring discretionary actions minimize water use.<br><br>Implement actions to protect and restore the availability of surface water and groundwater within GSENM. |   |

| Row No. | Alternative A  | Alternative B   | Alternative C  | Alternative D  | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP  |
|---------|--|---|--|--|---|--|--|
| -       | <b>WATER RESOURCES</b>   |   |  |  | <b>Not for analysis. For comparison only.</b>   |  | -  |
| 58.     | <p><b>Management Direction:</b><br/>Allow water sources to be developed for beneficial recreation and visitor-related uses in high-use remote areas, such as trailheads and recreational facilities.</p> | <p><b>Management Direction:</b><br/>Allow water sources to be developed to support recreation and visitor-related uses in high-use areas, such as trailheads and recreational facilities.</p> | <p><b>Management Direction: Front Country Area:</b><br/>Allow development and maintenance of water sources to support recreation and visitor-related uses.</p> <p><b>Passage, Outback, and Primitive Areas:</b><br/>Same as Alternative D.</p> | <p><b>Management Direction:</b><br/>Prohibit new recreation-related water developments, unless beneficial for natural resource maintenance, restoration, or protection of GSENM objects.</p> | <p><b>Management Direction:</b><br/>Allow water sources to be developed for beneficial recreation and visitor-related uses in high-use remote areas, such as trailheads and recreational facilities. (GSENM ROD 2020)</p> | <p><b>Management Direction:</b><br/>The need for water for visitor facilities within the Monument will be minimal because the only facilities provided will be a relatively small number of modest pullouts, toilets, parking areas, trailheads, and picnic sites. Most of these sites do not require water, including most toilet facilities which could use other technologies. In the limited cases where water is needed for a visitor facility, the acquisition of State appropriative water rights (that is, where water is needed for visitor facilities, the BLM may obtain appropriative water rights under Utah State law where the BLM meets Utah State law requirements. Campground, visitor, sanitary, and other administrative uses are clearly “beneficial uses of water” under Utah State law, for which water rights may be granted by the Utah State Engineer. Furthermore, none of the four administrative basins established by the Utah State Engineer has yet been closed to new appropriations because they are not considered fully appropriated. Utah State law also allows the United States and the BLM, as the landowner/managing entity, to obtain such water rights in its own name, rather than the actual users [that is, the visitors]) should be possible.</p> | <p><b>All Areas:</b><br/>Maintenance of existing recreation-related water developments may be allowed, consistent with the protection of GSENM objects.</p> <p><b>Modifications to existing recreation-related water developments may be allowed, if the existing water development and its modification would be consistent with the protection of GSENM objects.</b></p> <p><b>Front Country, Passage, and Outback Areas:</b><br/>New recreation-related water developments may be allowed, if the new water development and its construction would be consistent with the protection of GSENM objects.</p> <p><b>Primitive Area:</b><br/>New recreation-related water developments may be allowed, if the water development and its construction would protect and enhance GSENM objects.</p> |

| Row No. | Alternative A   | Alternative B  | Alternative C   | Alternative D  | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP   |
|---------|---|--|---|--|--|--|---|
| -       | <b>WATER RESOURCES</b>  |  |   |  | <b>Not for analysis. For comparison only.</b>  |  | -   |
| 59.     | <p><b>Management Direction:</b><br/>Allow new water developments and maintenance of existing water developments to improve livestock and wildlife distribution.</p> | <p><b>Management Direction:</b><br/>Allow new <b>non-recreational</b> water developments if they contribute to the protection <b>or</b> restoration, and/or increase the resiliency of GSENM objects or resources.</p> <p>Existing water developments for livestock or native terrestrial wildlife could be maintained or modified, where it protects, restores, and/or increases the resiliency of GSENM objects.</p> | <p><b>Management Direction:</b><br/><u>Front Country, Outback, and Passage Areas:</u><br/>Same as Alternative B.</p> <p><u>Primitive Area:</u><br/>Same as Alternative D.</p> | <p><b>Management Direction:</b><br/>Prohibit new <b>non-recreational</b> water developments unless the primary purpose of the water development is to protect or restore the resiliency <b>of</b> GSENM objects.</p> <p>Existing water developments for livestock or native terrestrial wildlife could be maintained or modified, where it protects, restores, and/or increases resiliency of GSENM objects.</p> | <p><b>Management Direction:</b><br/>Allow new water developments and maintenance of existing water developments to improve livestock and wildlife distribution. (GSENM ROD 2020)</p> | <p><b>Management Direction:</b><br/>New water developments for other uses could be permitted for the following purposes: better distribution of livestock when deemed to have an overall beneficial effect on Monument resources, or to restore or manage native species or populations. These developments could only be done when a NEPA analysis determines this tool to be the best means of achieving the above objectives and only when the water development will not dewater springs or streams.</p> | <p><u>All Areas:</u><br/>Maintenance of existing water developments for native wildlife may be allowed, consistent with the protection of GSENM objects.</p> <p><u>Modifications to existing water developments for native wildlife may be allowed, if the existing water development and its modification would be consistent with the protection of GSENM objects.</u></p> <p><u>Front Country, Passage, and Outback Areas:</u><br/>New water developments for native wildlife may be allowed, if the new water development and its construction would be consistent with the protection of GSENM objects.</p> <p><u>Primitive Area:</u><br/>Prioritize providing water for native wildlife through the maintenance, restoration, and/or enhancement of natural water sources. New water developments for native wildlife may be allowed, if the new water development and its construction would protect and enhance GSENM objects.</p> <p>(Note: water developments associated with livestock grazing are discussed as structural range improvements in the Livestock Grazing section.)</p> |

| Row No. | Alternative A   | Alternative B   | Alternative C | Alternative D   | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP  |
|---------|---|---|---------------|---|--|--|--|
| -       | <b>WATER RESOURCES</b>  |   |               |   | <b>Not for analysis. For comparison only.</b>  |  | -  |
| 60.     | <p><b>Management Direction:</b><br/>Prohibit new water developments in relict plant communities and hanging gardens. Allow maintenance activities, if these resources are not affected.</p> | <p><b>Management Direction:</b><br/>Prohibit new water developments in natural plant communities that lack invasives. Allow maintenance of existing developments in a manner that minimizes impacts on natural plant communities and to best conserve multiple resources.</p> |               | <p><b>Management Direction:</b><br/>Prohibit new water developments in natural plant communities that lack invasives. Existing improvements would be removed unless this would additionally harm resources.</p> | <p><b>Management Direction:</b><br/>Prohibit new water developments in relict plant communities and hanging gardens. Allow maintenance activities, if these resources are not affected. (GSENM ROD 2020)</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>In areas with native plant communities that lack nonnative, invasive species and are not anthropogenically manipulated (for example, relict plant communities):<br/>Maintenance of existing water developments may be allowed, consistent with the protection of GSENM objects.</p> <p>Modifications to existing water developments may be allowed, if the existing water development and its modification would be consistent with the protection of GSENM objects.</p> <p>Prohibit new water developments.</p> |



| Row No. | Alternative A  | Alternative B  | Alternative C | Alternative D   | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP  |
|---------|--|--|---------------|---|--|--|--|
| -       | <b>WATER RESOURCES</b>   |  |               |   | <b>Not for analysis. For comparison only.</b>  |  | -  |
| 61.     | <p><b>Management Direction:</b><br/>Avoid surface-disturbing actions in Drinking Water Source Protection Areas and culinary water sources. Develop strategies to mitigate any existing BLM-authorized activities that pose a threat to public water systems (GSENM ROD 2020).<br/>Allow surface-disturbing activities within Drinking Water Source Protection Areas where the disturbance does not degrade the resource and it is consistent with protection of GSENM objects. In these areas, locate permanent facilities to eliminate potential contamination or pollution sources, and design facilities to prevent contaminated discharges to groundwater (KEPA ROD 2020).</p> | <p><b>Management Direction:</b><br/>Avoid degradation of water resources from surface and/or subsurface discretionary actions in all surface and groundwater Drinking Water Source Protection Areas, culinary water sources, and/or sole source aquifers as identified by the UDWQ. Develop strategies to reduce adverse effects of existing BLM-authorized activities that pose a threat to public water systems and or/facilities.</p> |               | <p><b>Management Direction:</b><br/>Prohibit degradation of water resources (as consistent with valid existing rights) from surface and/or subsurface discretionary actions in all surface and groundwater Drinking Water Source Protection Areas, culinary water sources, and/or sole source aquifers as identified by the UDWQ.</p> | <p><b>Management Direction:</b><br/>Avoid surface-disturbing actions in Drinking Water Source Protection Zones and culinary water sources. Develop strategies to mitigate any existing BLM-authorized activities that pose a threat to public water systems. (GSENM ROD 2020)<br/><br/>Allow surface-disturbing activities within Drinking Water Source Protection Zones where the disturbance does not degrade the resource. In these areas locate permanent facilities to eliminate potential contamination or pollution sources, and design facilities to prevent contaminated discharges to groundwater. (KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Avoid degradation of water resources from surface and/or subsurface discretionary actions in all surface and groundwater Drinking Water Source Protection Areas, culinary water sources, and/or sole source aquifers as identified by the UDWQ. Develop strategies to reduce adverse effects of existing BLM-authorized activities that pose a threat to public water systems and or/facilities.</p> |

| Row No. | Alternative A  | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP  |
|---------|--|--|---------------|---------------|---|---|--|
| -       | <b>CULTURAL RESOURCES</b>  |  |               |               | <b>Not for analysis. For comparison only.</b>   |   | -  |
| 62.     | <p><b>Goal:</b><br/>Provide for the proper care and maintenance of cultural resources. Identify, preserve, and protect significant cultural resources and ensure that they are available for appropriate uses by present and future generations on BLM-managed surface lands.</p> <p>Seek to reduce imminent threats and resolve potential conflicts from natural or human-caused deterioration, or potential conflict with other resource uses.</p> | <p><b>Goal:</b><br/>Identify, document, preserve, and protect cultural resources and ensure that they are available for appropriate uses by present and future generations on BLM-managed lands.</p> |               |               | <p><b>Goal:</b><br/>Provide for the proper care and maintenance of cultural resources. Identify, preserve, and protect significant cultural resources and ensure that they are available for appropriate uses by present and future generations on BLM-administered surface lands. (GSENM ROD 2020, KEPA ROD 2020)</p> <p>Seek to reduce imminent threats and resolve potential conflicts from natural or human-caused deterioration, or potential conflict with other resource uses. (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Goal:</b><br/>Identify, document, and protect the array of archaeological resources in the Monument (MMP 2000).</p> <p>Manage uses to prevent damage to archaeological resources, increase public education and appreciation of archaeological resources through interpretation (MMP 2000).</p> | <p><b>Goal:</b><br/>Protect cultural resources and ensure they are available for present and future generations.</p>       |
| 63.     | <p><b>Objective:</b><br/>Seek to restore and stabilize important and at-risk cultural resources.</p>   | <p><b>Objective:</b><br/>Identify, preserve, and protect cultural resources, in place and in their original context.</p>   |               |               | <p><b>Objective:</b><br/>Seek to restore and stabilize important and at-risk cultural resources. (GSENM ROD 2020, KEPA ROD 2020)</p>  | <p><b>Objective:</b><br/>No similar objective.</p>  | <p><b>Objective:</b><br/>Identify, preserve, and protect cultural resources, in place and in their original context.</p>   |
| 64.     | <p><b>Objective:</b><br/>Provide opportunities for traditional (such as local heritage) uses of cultural resources and landscapes.</p>   | <p><b>Objective:</b><br/>Provide opportunities to connect to pioneer heritage.</p>   |               |               | <p><b>Objective:</b><br/>Provide opportunities for traditional (such as Native American or other local heritage) uses of cultural resources, sacred sites, landscapes, and native plants. (GSENM ROD 2020, KEPA ROD 2020)</p>   | <p><b>Objective:</b><br/>No similar objective.</p>  | <p><b>Objective:</b><br/>Provide opportunities to connect to pioneer heritage.</p>   |
| 65.     | <p><b>Management Direction:</b><br/>No similar management direction.</p>   | <p><b>Management Direction:</b><br/>Identify, monitor, and stabilize at-risk cultural resources.</p>   |               |               | <p><b>Management Direction:</b><br/>No similar management direction.</p>  | <p><b>Management Direction:</b><br/>The BLM will continue to inventory and conduct project compliance for archaeological resources. This will be done in order to evaluate their potential for protection, conservation, research, or interpretation (MMP 2000)</p>                                   | <p><b>Management Direction:</b><br/>Identify, monitor, and address deterioration of at-risk cultural resources.</p>        |
| 66.     | <p><b>Management Direction:</b><br/>No similar management direction.</p>   | <p><b>Management Direction:</b><br/>Avoid, reduce, and/or remove imminent and long-term threats to cultural resources.</p>   |               |               | <p><b>Management Direction:</b><br/>No similar management direction.</p>  | <p><b>Management Direction:</b><br/>No similar management direction.</p>  | <p><b>Management Direction:</b><br/>Avoid, reduce, and/or remove imminent and long-term threats to cultural resources.</p> |

| Row No. | Alternative A   | Alternative B   | Alternative C | Alternative D  | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan                                    | Alternative E 2024 Proposed RMP  |
|---------|---|---|---------------|--|---|--|--|
| -       | <b>CULTURAL RESOURCES</b>   |   |               |  | <b>Not for analysis. For comparison only.</b>   |  | -  |
| 67.     | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>Manage high-probability cultural resource areas (Class I – existing information inventory) as ROW avoidance. (See <i>Lands and Realty</i> section.)   |               | <b>Management Direction:</b><br>Manage high-probability cultural resource areas (Class I) as ROW exclusion. (See <i>Lands and Realty</i> section.) | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Manage high-probability cultural resource areas (Class I – existing information inventory) as ROW avoidance. (See <i>Lands and Realty</i> section.)  |
| 68.     | <b>Management Direction:</b><br>Develop cultural resources management plans for the former KEPA and each GSENM unit. These plans will assign cultural sites to use categories (such as public use, scientific, and traditional use), and management for the protection and interpretation of these sites. The criteria in Appendix J of the 2020 GSENM-KEPA Final EIS (Cultural Resources) will be used to assign cultural sites to appropriate classifications. Dance Hall Rock is assigned to the public use category. The cultural resource management plans will provide for the proper care and management of GSENM cultural resource objects. | <b>Management Direction:</b><br>Develop an implementation-level cultural resource management plan to help provide further guidance on resource- and site-specific strategies to ensure the protection of the cultural resources in place and in their original context. The criteria in Appendix D (Cultural Resources) will be used to assign cultural sites to appropriate classifications and guide management of those areas. |               |  | <b>Management Direction:</b><br>Develop cultural resources management plans for KEPA and each GSENM unit. These plans will assign cultural sites to use categories (such as public use, scientific, traditional use), and management for the protection and interpretation of these sites. The criteria in Appendix J of the 2020 GSENM-KEPA Final EIS (Cultural Resources) will be used to assign cultural sites to appropriate classifications. Dance Hall Rock is assigned to the public use category. The cultural resource management plans for GSENM will provide for the proper care and management of cultural resource monument objects. (GSENM ROD 2020, KEPA ROD 2020) | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Develop a cultural resource management plan to help provide further guidance on resource- and site-specific strategies to ensure the protection of the cultural resources in place and in their original context. The criteria in Appendix D (Cultural Resources) would be used to assign cultural sites to appropriate classifications and guide management of those areas. Dance Hall Rock is assigned to the public use category. |

| Row No. | Alternative A   | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan              | Alternative E 2024 Proposed RMP  |
|---------|---|--|---------------|---------------|---|--|--|
| -       | <b>TRIBAL STEWARDSHIP</b>   |  |               |               | <b>Not for analysis. For comparison only.</b>   |  | -  |
| 69.     | <b>Goal:</b><br>Recognize tribal and local county interests and work with tribes and counties to support uses of public lands, as appropriate.  | <b>Goal:</b><br>Honor Tribal Nation’s stewardship, interests, and uses of GSENM.   |               |               | <b>Goal:</b><br>Recognize tribal and local county interests and work with Tribes and counties to support uses of public lands, as appropriate. (GSENM ROD 2020, KEPA ROD 2020)  | <b>Goal:</b><br>No similar goal.           | <b>Goal:</b><br>Honor Tribal Nation’s stewardship, interests, uses, and ceremonial/spiritual connections to GSENM.   |
| 70.     | <b>Objective:</b><br>Develop and maintain working relationships with tribes having an interest in the area.   | <b>Objective:</b><br>Establish a management approach in coordination with Tribal Nations that ensures continued Tribal Nation stewardship of GSENM resources.                    |               |               | <b>Objective:</b><br>Develop and maintain working relationships with Tribes having an interest in the area. (GSENM ROD 2020, KEPA ROD 2020)   | <b>Objective:</b><br>No similar objective. | <b>Objective:</b><br>Establish a management approach in collaboration with Tribal Nations that ensures continued Tribal Nation stewardship of GSENM resources. Develop and maintain working relationships with Tribal Nations having ancestral, cultural, or historic ties to GSENM. |
| 71.     | <b>Objective:</b><br>No similar objective.  | <b>Objective:</b><br>Protect the integrity of cultural resources, sacred sites, traditional cultural landscapes, native plants, and other resources important to Tribal Nations. |               |               | <b>Objective:</b><br>No similar objective.  | <b>Objective:</b><br>No similar objective. | <b>Objective:</b><br>Protect the integrity of cultural resources, sacred sites, traditional cultural landscapes, native plants, wildlife, paleontology, and other resources important to Tribal Nations.   |
| 72.     | <b>Objective:</b><br>Consult with tribal governments regarding proposed land uses with the potential to affect resources identified as having tribal interests or concerns.           | <b>Objective:</b><br>No similar objective.   |               |               | <b>Objective:</b><br>Consult with tribal governments regarding proposed land uses with the potential to affect resources identified as having tribal interests or concerns. (GSENM ROD 2020, KEPA ROD 2020)           | <b>Objective:</b><br>No similar objective. | <b>Objective:</b><br>No similar objective.   |
| 73.     | <b>Objective:</b><br>Determine the types of resources of concern to tribes and local counties and consider tribal and county views when making land use allocations or decisions.     | <b>Objective:</b><br>No similar objective.   |               |               | <b>Objective:</b><br>Determine the types of resources of concern to Tribes and local counties and consider tribal and county views when making land use allocations or decisions. (GSENM ROD 2020, KEPA ROD 2020)     | <b>Objective:</b><br>No similar objective. | <b>Objective:</b><br>No similar objective.   |
| 74.     | <b>Objective:</b><br>Provide opportunities for traditional (such as Native American or other local heritage) uses of cultural resources, sacred sites, landscapes, and native plants. | <b>Objective:</b><br>No similar objective.   |               |               | <b>Objective:</b><br>Provide opportunities for traditional (such as Native American or other local heritage) uses of cultural resources, sacred sites, landscapes, and native plants. (GSENM ROD 2020, KEPA ROD 2020) | <b>Objective:</b><br>No similar objective. | <b>Objective:</b><br>No similar objective.   |

| Row No. | Alternative A  | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan                                    | Alternative E 2024 Proposed RMP   |
|---------|--|--|---------------|---------------|---|--|---|
| -       | <b>TRIBAL STEWARDSHIP</b>  |  |               |               | <b>Not for analysis. For comparison only.</b>   |  | -   |
| 75.     | <b>Management Direction:</b><br>No similar management direction.   | <b>Management Direction:</b><br>Avoid, reduce, and/or remove imminent and long-term threats to sacred sites, important landscapes, native plants, and other resources important to Tribal Nations.   |               |               | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Avoid, reduce, and/or remove imminent and long-term threats to sacred sites, important landscapes, native plants, wildlife, and other resources important to Tribal Nations.  |
| 76.     | <b>Management Direction:</b><br>Allow Native American noncommercial traditional use of vegetation and forestland woodland products for the collection of herbs, medicines, traditional use items, or items necessary for traditional, religious, or ceremonial purposes. | <b>Management Direction:</b><br>Provide Tribal Nations access to cultural resources, sacred sites, and traditional cultural landscapes without a permit, if for noncommercial purposes and it is consistent with the protection of GSENM objects.<br><br>With respect to Tribal Nations' use of GSENM, provide for casual collection of herbs, medicines, traditional use items, or items necessary for traditional, religious, or ceremonial purposes without a permit, where applicable by law and consistent with the protection of GSENM objects.<br><br>(see <i>Forestry and Woodland Products</i> section for noncommercial harvesting of forestry and woodland products). |               |               | <b>Management Direction:</b><br>Allow Native American noncommercial traditional use of vegetation and forestland woodland products for the collection of herbs, medicines, traditional use items, or items necessary for traditional, religious, or ceremonial purposes without a permit. (GSENM ROD 2020, KEPA ROD 2020) | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Provide members of Tribal Nations access to cultural resources, sacred sites, and traditional cultural landscapes, consistent with the protection of GSENM objects and in accordance with applicable law.<br><br>Allow members of Tribal Nations' noncommercial traditional use of vegetation and forest and wood products for the collection of herbs, medicines, traditional use items, or items necessary for traditional, religious, or ceremonial purposes, consistent with the Religious Freedom Restoration Act and other applicable laws. |
| 77.     | <b>Management Direction:</b><br>No similar management direction.   | <b>Management Direction:</b><br>Coordinate with Tribal Nations to determine how to appropriately educate the public about traditional histories, uses, practices, and sacred places.   |               |               | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Collaborate with Tribal Nations to determine how to appropriately educate the public about traditional histories, uses, practices, and sacred places.   |
| 78.     | <b>Management Direction:</b><br>No similar management direction.   | <b>Management Direction:</b><br>No similar management direction.   |               |               | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Collaborate with Tribal Nations to identify science (which includes research, monitoring, and data collection) needs associated with Indigenous knowledge.  |

| Row No. | Alternative A   | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP   |
|---------|---|--|---------------|---------------|---|--|---|
| -       | <b>TRIBAL STEWARDSHIP</b>   |  |               |               | <b>Not for analysis. For comparison only.</b>   |  | -   |
| 79.     | <p><b>Management Direction:</b><br/>Establish and maintain agreements with all Native American tribes interested in specific projects or areas on which they wish to consult.</p> | <p><b>Management Direction:</b><br/>In consultation with Tribal Nations, develop a <a href="#">tribal nation co-stewardship plan</a> to provide for specific co-stewardship relationships between the BLM and Tribal Nations. This implementation-level plan will address, but may not be limited to, addressing the following:</p> <ul style="list-style-type: none"> <li>• Cooperate in project-level planning.</li> <li>• Cooperate in program development (including education and interpretation about species, tribal uses, and other GSENM objects), resource protection, and public land access concerning GSENM.</li> <li>• Engage on an ongoing basis in joint dialogue, knowledge-sharing and learning programs for BLM managers and professional staff, tribal officials, and other appropriate parties to address critical resource management, tribal and agency program priorities, and a shared awareness of the tribal context of the landscape, including the need to protect both visible and sacred tribal uses and activities, as well as GSENM objects and other resources.</li> <li>• Regularly coordinate, consult, and engage on resource management priorities including project planning and joint management opportunities within GSENM.</li> <li>• Develop opportunities to engage tribal youth in the culture and traditions in GSENM, as well as the protection and management of GSENM to cultivate a shared understanding of GSENM’s context and a shared stewardship for its resources.</li> <li>• Cooperatively seek additional partnerships, funds, and authorities to achieve shared tribal and federal land management goals.</li> <li>• Maintain the confidentiality of documents and deliberations to the extent legally permissible prior to the contents of such documents and deliberations becoming publicly available through official releases, such as the public release of any planning or NEPA documents, including drafts.</li> <li>• Take all reasonable measures to protect information regarding sacred sites, traditional ceremonies and other rituals from disclosure to prevent damage or desecration.</li> <li>• Explore opportunities for repatriating cultural resources and related data excavated or removed from federal lands.</li> <li>• Work collaboratively to ensure Tribal Nations have access to sacred sites and other areas of tribal importance in GSENM for cultural purposes.</li> <li>• Work collaboratively to develop a strategy for inventorying and monitoring the objects and values within GSENM. Within this strategy, identify how to obtain input from tribal members, in particular tribal elders, who cannot travel to remote sites.</li> <li>• <a href="#">Make placename change recommendations for the U.S. Board of Geographic Names to better honor tribal stewardship of this landscape.</a></li> <li>• <a href="#">Work with Tribal Nations to develop timelines associated with discretionary action reviews based on tribal interest.</a></li> </ul> |               |               | <p><b>Management Direction:</b><br/>Establish and maintain agreements with all Native American Tribes interested in specific projects or areas on which they wish to consult. (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/><a href="#">Collaborate with Tribal Nations to develop a co-stewardship plan(s) to provide for specific co-stewardship relationships between the BLM and Tribal Nations. This plan would include, but not be limited to, how the BLM and Tribal Nations would:</a></p> <ul style="list-style-type: none"> <li>• <a href="#">Collaborate in program development (including education and interpretation about species, tribal uses, and other GSENM objects), resource protection, and public land access concerning GSENM.</a></li> <li>• <a href="#">Engage on an ongoing basis in joint dialogue and knowledge-sharing and learning programs for BLM managers and professional staff, tribal officials, and other appropriate parties to address resource management, tribal and agency program priorities, and to build a shared awareness of the tribal context of the landscape, including Indigenous knowledge and perspectives, as well as GSENM objects and resources.</a></li> <li>• <a href="#">Regularly collaborate, consult, and engage on resource management priorities, including project planning and joint management opportunities within GSENM. Develop opportunities to engage tribal youth in the culture and traditions in GSENM, as well as the protection and management of GSENM, to cultivate a shared understanding of GSENM’s context and a shared stewardship for its resources.</a></li> <li>• <a href="#">Collaboratively seek additional partnerships, funds, and authorities to achieve shared tribal and federal land management goals.</a></li> </ul> |

| Row No.        | Alternative A             | Alternative B | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs                      | 2000 Monument Management Plan | Alternative E<br>2024 Proposed RMP   |
|----------------|---------------------------|---------------|---------------|---------------|---|-------------------------------|--|
| -              | <b>TRIBAL STEWARDSHIP</b> |               |               |               | <b>Not for analysis. For comparison only.</b> |                               | -  |
| 79.<br>(cont.) | (see above)               | (see above)   |               |               | (see above)                                   | (see above)                   | <ul style="list-style-type: none"> <li>• Consult with tribes about creative solutions to maintain tribal data sovereignty.</li> <li>• Maintain the confidentiality of documents and deliberations to the extent legally permissible prior to the contents of such documents and deliberations becoming publicly available through official releases, such as the public release of any planning or NEPA documents, including drafts.</li> <li>• Take all reasonable measures to protect information regarding sacred sites, traditional ceremonies, and other rituals from disclosure to prevent damage or desecration.</li> <li>• Explore opportunities for repatriating cultural resources and related data excavated or removed from federal lands.</li> <li>• Work collaboratively to ensure Tribal Nations have access to sacred sites and other areas of tribal importance in GSENM for cultural purposes.</li> <li>• Work collaboratively to develop a strategy for inventorying and monitoring the objects and values within GSENM. Within this strategy, identify how to obtain input from tribal members, in particular tribal elders, who cannot travel to remote sites.</li> <li>• Recommend placename changes for the U.S. Board of Geographic Names to better honor tribal stewardship of this landscape.</li> <li>• Work with Tribal Nations to develop timelines associated with discretionary action reviews based on tribal interest.</li> </ul> |

| Row No. | Alternative A   | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan   | Alternative E<br>2024 Proposed RMP                                       |
|---------|---|--|---------------|---------------|---|---|--|
| -       | <b>TRIBAL STEWARDSHIP</b>   |  |               |               | <b>Not for analysis. For comparison only.</b>   |   | -  |
| 80.     | <p><b>Management Direction:</b><br/>Establish continuing collaborative programs with local communities, organizations, local and state agencies, Native American communities, outfitters and guides, volunteers, and other interested parties. The purpose is to identify, inventory, document, monitor, and develop and implement plans for the restoration, stabilization, protection, and/or interpretation of appropriate sites. Continue the current Oral History Program in cooperation with local communities.</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> |               |               | <p><b>Management Direction:</b><br/>Establish continuing collaborative programs with local communities, organizations, local and State agencies, Native American communities, outfitters and guides, volunteers, and other interested parties to identify, inventory, document, monitor, and develop and implement plans for the restoration, stabilization, protection, and/or interpretation of appropriate sites and resources. Continue the current Oral History Program in cooperation with local communities. (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>The BLM will establish continuing collaborative programs with local communities, organizations, local and State agencies, Native American Indian communities, outfitters and guides, volunteers, and other interested parties. This will be done in order to identify, inventory, monitor, and develop and implement plans for the restoration, stabilization, protection, and/or interpretation of appropriate sites and resources within the Monument. The collaborative programs will include the continuation of the current Oral History Program in cooperation with local communities. The Oral History Program focuses on the collection of histories from local residents and people knowledgeable about the region. The BLM will use the information collected to create a better understanding of cultures and communities and will work to showcase the histories of the local communities as part of the “long and dignified history” of the Monument (2000 MMP).</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> |



| Row No. | Alternative A  | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan                                    | Alternative E 2024 Proposed RMP  |
|---------|--|--|---------------|---------------|--|--|--|
| -       | <b>TRIBAL STEWARDSHIP</b>  |  |               |               | <b>Not for analysis. For comparison only.</b>                    |  | -  |
| 81.     | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>No similar management direction. |               |               | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>In recognition of the importance of tribal knowledge about the lands and resources in GSENM, and to ensure that management decisions affecting GSENM reflect the expertise and Indigenous knowledge of interested Tribal Nations, in addition to government-to-government consultation, implement the following measures: <ul style="list-style-type: none"> <li>• Honor that Tribal Nations retain the right and discretion to share, or to not share, Indigenous knowledge, including in each opportunity identified by the BLM.</li> <li>• Honor that Tribal Nations retain the right and discretion to participate, or to not participate, in this BLM process to solicit and incorporate Indigenous knowledge into plan implementation.</li> <li>• Offer to develop and execute data-sharing agreements with interested Tribal Nations to help protect the privacy of any Indigenous knowledge shared by Tribal Nations. However, do not require Tribal Nations to agree to data-sharing agreements. With or without a data-sharing agreement, use all legal authorities available to maintain the privacy of any Indigenous knowledge shared by Tribal Nations.</li> <li>• Invite Tribal Nations to identify an Indigenous knowledge point of contact to ensure efficient communications.</li> </ul> |

| Row No.        | Alternative A             | Alternative B | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs                      | 2000 Monument Management Plan | Alternative E<br>2024 Proposed RMP   |
|----------------|---------------------------|---------------|---------------|---------------|---|-------------------------------|--|
| -              | <b>TRIBAL STEWARDSHIP</b> |               |               |               | <b>Not for analysis. For comparison only.</b> |                               | -  |
| 81.<br>(cont.) | (see above)               | (see above)   |               |               | (see above)                                   | (see above)                   | <ul style="list-style-type: none"> <li>• Send quarterly reports to each interested Tribal Nation to inform them of new projects, the status of ongoing projects, and opportunities to contribute Indigenous knowledge.</li> <li>• Host semiannual (twice-a-year) meetings with interested Tribal Nations to:               <ul style="list-style-type: none"> <li>○ Determine which types of projects are of interest to the Tribal Nations to further inform the quarterly reports, semiannual meetings, and the notification/engagement process identified below</li> <li>○ Discuss the projects shared in the quarterly reports, and the incorporation, or lack thereof, of any recommendations offered by Tribal Nations for those projects</li> <li>○ Discuss the GSENM science plan, including presentations on completed research projects, opportunities to participate in ongoing research projects, and the identification of future research priorities</li> <li>○ Identify opportunities for proactive management on BLM and Tribal Nations' land management priorities</li> <li>○ Identify opportunities to inform management via the contributions of Indigenous knowledge</li> <li>○ Share any applicable federal funding, training, and employment opportunities.</li> </ul> </li> </ul> |

| Row No.        | Alternative A             | Alternative B | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs                      | 2000 Monument Management Plan | Alternative E<br>2024 Proposed RMP  |
|----------------|---------------------------|---------------|---------------|---------------|---|-------------------------------|---|
| -              | <b>TRIBAL STEWARDSHIP</b> |               |               |               | <b>Not for analysis. For comparison only.</b> |                               | -   |
| 81.<br>(cont.) | (see above)               | (see above)   |               |               | (see above)                                   | (see above)                   | <ul style="list-style-type: none"> <li>• For the types of projects that have been identified to be of interest to the Tribal Nations (see above), at least 15 calendar days prior to the initiation of an applicable NEPA document, email those Tribal Nations to inform them of the proposed action and invite them to participate in the refinement of the proposal and contribute their Indigenous knowledge.               <ul style="list-style-type: none"> <li>○ If Tribal Nations respond within 15 days and elect to participate, provide a schedule that includes the time frames for the Tribal Nations to provide input and contribute Indigenous knowledge as part of each internal review stage and before the final decision is issued. If the BLM decides not to incorporate specific recommendations timely submitted by a Tribal Nation, following collaborative discussions seeking resolution, the BLM will provide the Tribal Nations a written explanation.</li> <li>○ If Tribal Nations do not respond to the initial email, seek to contact the Tribal Nations by other means. If no contact has been made within 20 days, the project will proceed and can be discussed at the semiannual meeting.</li> <li>○ Timelines may be modified subject to mutual agreement between the BLM and Tribal Nation(s).</li> </ul> </li> </ul> |

| Row No. | Alternative A  | Alternative B   | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP   |
|---------|--|---|---------------|---------------|--|--|---|
| -       | <b>PALEONTOLOGICAL RESOURCES AND GEOLOGY</b>   |   |               |               | <b>Not for analysis. For comparison only.</b>  |  | -   |
| 82.     | <b>Goal:</b><br>Manage paleontological resources to protect them and make them accessible for appropriate research and public enjoyment.   | <b>Goal:</b><br>Ensure the preservation and protection of paleontological and geological resources.   |               |               | <b>Goal:</b><br>Manage paleontological resources in order to protect them and make them accessible to appropriate research and public enjoyment. (GSENM ROD 2020, KEPA ROD 2020)   | <b>Goal:</b><br>No similar goal.   | <b>Goal:</b><br>Ensure the preservation and protection of paleontological and geological resources.   |
| 83.     | <b>Objective:</b><br>Continue to inventory paleontological resources and evaluate their significance for protection, conservation, research, or interpretation.  | <b>Objective:</b><br>No similar objective (this is covered in a management action).   |               |               | <b>Objective:</b><br>Continue to inventory for paleontological resources and evaluate their significance for protection, conservation, research, or interpretation. (GSENM ROD 2020, KEPA ROD 2020)  | <b>Objective:</b><br>The BLM will continue to inventory the Monument for paleontological resources and evaluate their potential for protection, conservation, research, or interpretation.       | <b>Objective:</b><br>No similar objective   |
| 84.     | <b>Objective:</b><br>Protect known paleontological resources from destruction or degradation. This also applies to materials from public lands located in museum collections.<br><br>Manage uses to prevent unnecessary damage to paleontological resources. | <b>Objective:</b><br>Protect paleontological and geologic resources from destruction or degradation.<br><br>Manage discretionary uses to prevent unnecessary damage to paleontological resources. |               |               | <b>Objective:</b><br>Protect known paleontological resources from destruction or degradation. This also applies to materials from public lands located in museum collections. (GSENM ROD 2020, KEPA ROD 2020)<br>Manage uses to prevent unnecessary damage to paleontological resources. (GSENM ROD 2020, KEPA ROD 2020) | <b>Objective:</b><br>Protect the abundant paleontological resources in the Monument from destruction or degradation. Manage uses to prevent damage to paleontological resources in the Monument. | <b>Objective:</b><br>Protect paleontological and geologic resources from destruction or degradation.<br><br>Manage discretionary uses to prevent unnecessary damage to paleontological resources. |
| 85.     | <b>Management Direction:</b><br>No similar management direction  | <b>Management Direction:</b><br>Identify and protect paleontological and geological sites and specimens appropriate for public access.  |               |               | <b>Management Direction:</b><br>No similar management direction.   | <b>Management Direction:</b><br>No similar management direction.   | <b>Management Direction:</b><br>Identify and protect paleontological and geological sites and specimens appropriate for public access.  |

| Row No. | Alternative A  | Alternative B   | Alternative C | Alternative D   | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP   |
|---------|--|---|---------------|---|---|--|---|
| -       | <b>PALEONTOLOGICAL RESOURCES AND GEOLOGY</b>   |   |               |   | <b>Not for analysis. For comparison only.</b>   |  | -   |
| 86.     | <p><b>Management Direction:</b><br/>Conduct proactive (noncompliance-driven) inventory of lands managed under the GSENM RMP (2020) for paleontological resources and evaluate their potential for protection, conservation, research, or interpretation. Areas with <a href="#">potential fossil yield classification</a> (PFYC) ratings of 4 or 5 or with potential conflicts with other resources or threats from other uses will be given priority over those areas with lower PFYC ratings or no known user conflicts/threats.</p> | <p><b>Management Direction:</b><br/>Proactively maintain an annual program of inventorying, monitoring, and, where appropriate, collecting and curation for paleontological and geological resources. Focus on areas and resources identified in Proclamation 10286 and other fossil areas with PFYC ratings of 4 and 5 and utilizing scientific principles and guidance.</p> |               |   | <p><b>Management Direction:</b><br/>Conduct proactive (non-compliance-driven) inventory of GSENM for paleontological resources and evaluate their potential for protection, conservation, research, or interpretation. Areas with PFYC ratings of 4 or 5 or with potential conflicts with other resources or threats from other uses will be given priority over those areas with lower PFYC ratings or no known user conflicts/threats. (GSENM ROD 2020)</p> | <p><b>Management Direction:</b><br/>A monitoring program will be used to assess management needs of sensitive sites and areas. All proposed projects will be required to include a paleontological site inventory, and appropriate strategies will be used to avoid sensitive sites, restrict access to the sensitive resource (that is, construct barriers), or as a last resort, excavate and curate the resource.</p> | <p><b>Management Direction:</b><br/><a href="#">Proactively maintain an annual program of inventorying, monitoring, and, where appropriate, collecting and curation for paleontological and geological objects and resources. Focus on areas and resources identified in Proclamation 10286 and other fossil areas with PFYC ratings of 4 and 5 and utilizing scientific principles and guidance.</a></p> |
| 87.     | <p><b>Management Direction:</b><br/>No similar management direction.</p>   | <p><b>Management Direction:</b><br/>No similar management direction (most of GSENM is ROW avoidance or exclusion; see <i>Lands and Realty</i>).</p>   |               | <p><b>Management Direction:</b><br/>Manage PFYC 4 and 5 as ROW exclusion.</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p>  | <p><b>Management Direction:</b><br/>No similar management direction.</p>   | <p><b>Management Direction:</b><br/><a href="#">No similar management direction.</a></p>  |

| Row No. | Alternative A  | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP  |
|---------|--|--|---------------|---------------|---|--|--|
| -       | <b>PALEONTOLOGICAL RESOURCES AND GEOLOGY</b>   |  |               |               | <b>Not for analysis. For comparison only.</b>   |  | -  |
| 88.     | <p><b>Management Direction:</b><br/>Develop a paleontological RMP for lands with high potential for scientifically significant fossils (that is, PFYC 4 and 5). The paleontological RMP would include the following components:</p> <ul style="list-style-type: none"> <li>• Basic structure and organization of the paleontological resource program</li> <li>• Protocols for inventory, collection, and protection of paleontological resources</li> <li>• Protocols for managing paleontological sites by class, including the identification of scientific, educational, and recreational use opportunities</li> <li>• Protocols for volunteer/citizen scientist involvement in paleontological resource management/research</li> <li>• Development of a consistent PFYC system for use throughout the planning area</li> <li>• Coordination with counties or municipalities on appropriate exhibits</li> <li>• Opportunities for local interpretation of paleontological resources</li> </ul> | <p><b>Management Direction:</b><br/>Develop a paleontological resource implementation plan in coordination with academic institutions, interested stakeholders, and appropriate state and local government, including counties and municipalities, that includes, but is not limited to, the following components:</p> <ul style="list-style-type: none"> <li>• Development of a consistent PFYC system for use throughout the planning area</li> <li>• Basic structure and organization of the paleontological resource program</li> <li>• Protocols for inventory, collection, and protection of paleontological resources</li> <li>• Protocols for managing paleontological sites by class, including the identification of scientific, educational, and recreational use opportunities</li> <li>• Protocols for volunteer/citizen scientist involvement in paleontological resource management/research</li> <li>• Development of a catalog of field locations needing baseline inventories where various impacts are adversely affecting resources</li> <li>• Development of annual inventory, monitoring, and collection plans for paleontological resources in coordination with the relevant research communities</li> <li>• Development of site security plans for threatened or vulnerable sites</li> <li>• On-site (at designated sites) or community-based interpretation for significant sites/specimens to create opportunities for public access and appreciation</li> <li>• Protocol for monitoring trends and conditions of paleontological sites, including prioritization for scientifically important fossils and based on threats</li> <li>• Collections management strategy including specimens in off-site museums</li> </ul> |               |               | <p><b>Management Direction:</b><br/>Develop a paleontological RMP for GSENM and certain KEPA lands with high potential for scientifically significant fossils (that is, PFYC 4 and 5). The paleontological RMP would include the following components:</p> <ul style="list-style-type: none"> <li>• Basic structure and organization of the paleontological resource program</li> <li>• Protocols for inventory, collection, and protection of paleontological resources</li> <li>• Protocols for managing paleontological sites by class, including the identification of scientific, educational, and recreational use opportunities</li> <li>• Protocols for volunteer/citizen scientist involvement in paleontological resource management/research</li> <li>• Development of a consistent PFYC system for use throughout the planning area</li> <li>• Coordination with counties or municipalities on appropriate exhibits</li> <li>• Opportunities for local interpretation of paleontological resources</li> <li>• On-site (at designated sites) or community-based interpretation for significant sites/specimens to create opportunities for public access and appreciation</li> </ul> | <p><b>Management Direction:</b><br/>Public education and interpretation will be emphasized to improve visitor understanding of paleontological resources and to prevent damage. Collaborative partnerships with volunteers, universities, and other research institutions will be pursued to document, preserve, monitor or interpret sites consistent with the overall objective of protecting paleontological resources.</p> <p>Facilitate appropriate paleontological research to improve understanding of paleontological resources within</p> | <p><b>Management Direction:</b><br/>Develop a paleontological resource plan in coordination with academic institutions, interested stakeholders, and appropriate state and local government, including counties and municipalities, that includes, but is not limited to, the following components:</p> <ul style="list-style-type: none"> <li>• Development of a consistent PFYC system for use throughout the planning area</li> <li>• Basic structure and organization of the paleontological resource program</li> <li>• Protocols for inventory, collection, and protection of paleontological resources</li> <li>• Protocols for managing paleontological sites by class, including the identification of scientific, educational, and recreational use opportunities</li> <li>• Protocols for volunteer/citizen scientist involvement in paleontological resource management/research</li> <li>• Development of a catalog of field locations needing baseline inventories where various impacts are adversely affecting resources</li> <li>• Development of annual inventory, monitoring, and collection plans for paleontological resources in coordination with the relevant research communities</li> <li>• Development of site security plans for threatened or vulnerable sites</li> </ul> |

| Row No.        | Alternative A   | Alternative B | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan | Alternative E 2024 Proposed RMP   |
|----------------|---|---------------|---------------|---------------|--|-------------------------------|---|
| -              | <b>PALEONTOLOGICAL RESOURCES AND GEOLOGY</b>  |               |               |               | <b>Not for analysis. For comparison only.</b>  |                               | -   |
| 88.<br>(cont.) | <ul style="list-style-type: none"> <li>On-site (at designated sites) or community-based interpretation for significant sites/specimens to create opportunities for public access and appreciation</li> <li>Protocol for monitoring trends and conditions of paleontological sites, including prioritization for scientifically important fossils and based on threats</li> <li>Collections management strategy including off-site specimens in museums</li> <li>Coordination with academic institutions, interested stakeholders, and appropriate state and local government, including counties and municipalities, in the development of the paleontological RMP</li> </ul> | (see above)   |               |               | <ul style="list-style-type: none"> <li>Protocol for monitoring trends and conditions of paleontological sites, including prioritization for scientifically important fossils and based on threats</li> <li>Collections Management Strategy including off-site specimens in museums</li> <li>Coordination with academic institutions, interested stakeholders, and appropriate State and local government, including counties and municipalities, in the development of the paleontological RMP (GSENM ROD 2020, KEPA ROD 2020).</li> </ul> | (see above)                   | <ul style="list-style-type: none"> <li>On-site (at designated sites) or community-based interpretation for significant sites/specimens to create opportunities for public access and appreciation</li> <li>Protocol for monitoring trends and conditions of paleontological sites, including prioritization for scientifically important fossils and based on threats</li> <li>Collections management strategy including specimens in off-site museums</li> </ul> |

| Row No. | Alternative A   | Alternative B   | Alternative C | Alternative D   | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP   |
|---------|---|---|---------------|---|---|---|---|
| -       | <b>FISH AND WILDLIFE</b>  |   |               |   | <b>Not for analysis. For comparison only.</b>   |   | -   |
| 89.     | <p><b>Goal:</b><br/>Manage the biological integrity of terrestrial and aquatic ecosystems to maintain and/or improve habitat and fish and wildlife populations, with emphasis on ecosystem health and overall biodiversity.</p>   | <p><b>Goal:</b><br/>Manage the biological integrity of terrestrial and aquatic ecosystems for the benefit of native aquatic, avian, and terrestrial wildlife habitats and populations, with emphasis on ecosystem health, resiliency, and biodiversity.</p>   |               |   | <p><b>Goal:</b><br/>Manage the biological integrity of terrestrial and aquatic ecosystems to maintain and/or improve habitat and fish and wildlife populations, with emphasis on ecosystem health and overall biodiversity. (GSENM ROD 2020, KEPA ROD 2020)</p>   | <p><b>Goal:</b><br/>Manage uses to prevent damage to fish and wildlife species and their habitats (2000 MMP).</p>   | <p><b>Goal:</b><br/>Manage the biological integrity of terrestrial and aquatic ecosystems for the benefit of aquatic, avian, and terrestrial wildlife habitats and populations, with emphasis on native ecosystem health, habitat connectivity and corridors, resiliency, and biodiversity.</p> |
| 90.     | <p><b>Objective:</b><br/>Maintain and/or improve and enhance aquatic and wildlife resources and provide biological diversity to support healthy ecosystems.</p> <p>Conserve habitat for migratory birds and emphasize management of migratory birds listed on the U.S. Department of the Interior, Fish and Wildlife Service's (USFWS) current list of Birds of Conservation Concern and the Partners-in-Flight priority species.</p> <p>Maintain and/or improve habitat quantity and quality (forage, water, cover, space, security, trophic level integrity, and biogeochemical processes) sufficient to sustain diverse wildlife populations. Also, meet objectives identified in coordination with the UDWR, USFWS, and other federal, state, and local agencies in managing special status species and their habitat.</p> <p>Maintain and/or improve aquatic stream habitat to</p> | <p><b>Objective:</b><br/>Maintain and restore aquatic, avian, and terrestrial wildlife habitat quality and quantity, including seasonal, migratory, and connectivity habitats, to provide for biologically diverse and healthy ecosystems to meet BLM Utah Rangeland Health Standards (Standard 3).</p> |               | <p><b>Objective:</b><br/>Maintain, enhance, and/or restore aquatic, avian, and terrestrial wildlife habitat quality and quantity, including seasonal, migratory, and connectivity habitats, to provide for biologically diverse and healthy ecosystems.</p> | <p><b>Objective:</b><br/>Maintain and/or improve and enhance aquatic and wildlife resources and provide biological diversity to support healthy ecosystems. (GSENM ROD 2020, KEPA ROD 2020)</p> <p>Conserve habitat for migratory birds and emphasize management of migratory birds listed on the USFWS's current list of Birds of Conservation Concern and the Partners-in-Flight priority species. (GSENM ROD 2020, KEPA ROD 2020)</p> <p>Maintain and/or improve habitat quantity and quality (forage, water, cover, space, security, trophic level integrity, and biogeochemical processes) sufficient to sustain diverse wildlife populations, meeting objectives identified in coordination with the UDWR, USFWS, and other federal, state, and local agencies in managing special status species and their habitat. (GSENM ROD 2020, KEPA ROD 2020)</p> <p>Maintain and/or improve aquatic stream habitat to</p> | <p><b>Objective:</b><br/>Work in conjunction with the UDWR in managing fish, wildlife, and other animals to achieve and maintain natural populations, population dynamics, and population distributions in a way that protects and enhances Monument resources (2000 MMP).</p> <p>The BLM will manage habitats for the recovery or <b>reestablishment</b> of native populations through collaborative planning with local, state and federal agencies, user groups, and interested organizations (2000 MMP).</p> <p>The BLM will place a priority on protecting riparian and water resources as they relate to fish and wildlife and will work cooperatively with the Forest Service to coordinate maintenance of fisheries and flows (2000 MMP).</p> | <p><b>Objective:</b><br/>Protect aquatic, avian, and terrestrial wildlife habitat quality and quantity, including seasonal, migratory, and connectivity habitats, to provide for biologically diverse and healthy ecosystems to meet BLM Utah Rangeland Health Standards.</p>                   |



| Row No.        | Alternative A   | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP   |
|----------------|---|--|---------------|---------------|---|---|---|
| -              | <b>FISH AND WILDLIFE</b>  |  |               |               | <b>Not for analysis. For comparison only.</b>   |   | -   |
| 90.<br>(cont.) | support productive and diverse fisheries and other aquatic populations.   | (see above)  |               | (see above)   | support productive and diverse fisheries and other aquatic populations. (GSENM ROD 2020, KEPA ROD 2020)   | (see above)   | (see above)   |
| 91.            | <b>Objective:</b><br>Maintain and/or improve habitat connectivity and unrestricted wildlife movement between ecological areas to the maximum extent possible. | <b>Objective:</b><br>Incorporate state wildlife agency habitat management goals and associated actions related to big game winter and summer range and migration corridors, and migration corridors for birds, insects, and fish, with measurable outcomes, into ongoing wildlife management (such as maintenance of related infrastructure) and project-level planning. |               |               | <b>Objective:</b><br>Maintain and/or improve habitat connectivity and unrestricted wildlife movement between ecological areas to the maximum extent possible. (GSENM ROD 2020, KEPA ROD 2020) | <b>Objective:</b><br>The BLM will preserve the integrity of wildlife corridors, migration routes and access to key forage, nesting, and spawning areas by limiting adverse impacts from development in the Monument (2000 MMP). | <b>Objective:</b><br>Incorporate state wildlife agency habitat management goals and associated actions related to big game winter and summer range and migration corridors for birds, insects, and fish, with measurable outcomes, into ongoing wildlife management (such as maintenance of related infrastructure) and project-level planning. |
| 92.            | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>Prohibit placement of new permanent structures or roads where they would reduce animal or plant population resiliency or inhibit big game migration on a long-term basis.  |               |               | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>Prohibit placement of new permanent structures or roads where they would reduce animal or plant population resiliency or inhibit big game migration on a long-term basis.   |
| 93.            | <b>Management Direction:</b><br>Design road crossings of waterbodies that support fish to allow for fish passage; exceptions may be considered.               | <b>Management Direction:</b><br>Design waterway road crossings to provide aquatic species passage and floodplain connectivity as well as to allow for high flow events.  |               |               | <b>Management Direction:</b><br>Design road crossings of waterbodies that support fish to allow for fish passage; exceptions may be considered. (GSENM ROD 2020, KEPA ROD 2020)               | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>Design waterway road crossings to allow for high flow events and to provide aquatic species passage and floodplain connectivity.  |

| Row No. | Alternative A  | Alternative B  | Alternative C  | Alternative D  | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP |
|---------|--|--|--|--|--|--|---------------------------------|
| -       | <b>FISH AND WILDLIFE</b>   |  |  |  | <b>Not for analysis. For comparison only.</b>  |  | -                               |
| 94.     | <p><b>Management Direction:</b><br/>Any proposal to use domestic sheep/goats as pack animals or for any other use would be considered per BLM Manual 1730 (or applicable guidance). A site-specific analysis of any proposal would be conducted to identify the level of risk to the health of wild sheep and determine whether the action can occur and still achieve effective separation between domestic sheep/goats and wild sheep.</p> | <p><b>Management Direction:</b><br/>Ensure that management provides for effective physical separation between domestic sheep/goats and desert bighorn sheep.</p> | <p><b>Management Direction:</b><br/>Prohibit domestic sheep or goats as the kind (species) of livestock on 10-year grazing permits. Domestic sheep and goats could be used, as appropriate, for vegetation management or scientific research purposes, if effective physical separation between domestic sheep/goats and wild sheep will be maintained. Domestic sheep and goats may only be used as pack animals outside occupied desert bighorn sheep habitat.</p> | <p><b>Management Direction:</b><br/>Any proposal to use domestic sheep/goats as pack animals or for any other use would be considered per BLM Manual 1730 (or applicable guidance). A site-specific analysis of any proposal would be conducted to identify the level of risk to the health of wild sheep and determine whether the action can occur and still achieve effective separation between domestic sheep/goats and wild sheep. (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>No allotments will be converted from cows and horses to domestic sheep within at least a 9-mile buffer of bighorn sheep habitat, except where topographic features or other barriers prevent physical contact. This is in order to prevent the spread of disease from domestic sheep to desert bighorn sheep. Other BLM guidelines or policies in regard to domestic and wild stock interactions will also apply (2000 MMP).</p> | <p><b>Management Direction:</b><br/>Domestic sheep and goats may only be used as pack animals outside occupied desert bighorn sheep habitat.<br/><br/>The BLM may authorize the use of domestic sheep and/or goats to meet vegetation management objectives or for scientific research purposes, if consistent with the protection of GSENM objects and effective physical separation between domestic sheep/goats and wild sheep is maintained.</p> |                                 |

| Row No. | Alternative A   | Alternative B  | Alternative C  | Alternative D   | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP   |
|---------|---|--|--|---|--|---|---|
| -       | <b>FISH AND WILDLIFE</b>  |  |  |   | <b>Not for analysis. For comparison only.</b>  |   | -   |
| 95.     | <p><b>Management Direction:</b><br/>Manage habitats for the recovery or reestablishment of native, naturalized, or introduced fish and wildlife species in accordance with UDWR species management plans with goals and objectives set forth by UDWR.</p> <p>Allow maintenance of existing habitat treatments that benefit native, naturalized, or introduced fish and wildlife, as well as other resources and uses of BLM-managed land.</p> <p>Allow new habitat improvement treatments to benefit native, naturalized, or introduced fish and wildlife, as well as other resources and uses of BLM-administered land in accordance with current species-specific guidelines and local working group prescriptions.</p> | <p><b>Management Direction:</b><br/>Maintain and restore habitat through vegetation management or other actions (such as instream habitat improvement) to support sustainable populations of native aquatic, avian, and terrestrial wildlife species.</p>                              | <p><b>Management Direction: Front, Passage, and Outback Areas:</b><br/>Same as Alternative B.</p> <p><b>Primitive Area:</b><br/>Same as Alternative D.</p> | <p><b>Management Direction:</b><br/>Maintain, enhance, and/or restore native habitat through vegetation management or other actions to support sustainable populations of native aquatic, avian, and terrestrial wildlife species, prioritizing natural processes and techniques (such as low-tech process-based restoration) over other methods.</p> | <p><b>Management Direction:</b><br/>Manage habitats for the recovery or reestablishment of native, naturalized, or introduced fish and wildlife species in accordance with UDWR species management plans with goals and objectives set forth by UDWR. (GSENM ROD 2020, KEPA ROD 2020)</p> <p>Allow maintenance of existing habitat treatments that benefit native, naturalized, or introduced fish and wildlife, as well as other resources and uses of BLM-administered land.</p> <p>Allow new habitat improvement treatments to benefit native, naturalized, or introduced fish and wildlife, as well as other resources and uses of BLM-administered land in accordance with current species-specific guidelines and local working group prescriptions. (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>Work cooperatively with the UDWR to reestablish populations of native species to historic ranges within the boundaries of the Monument, and to take needed actions to protect and enhance the habitat of these native species (MMP 2000).</p> | <p><b>Management Direction: Front, Passage, and Outback Areas:</b><br/>Maintain and restore habitat through vegetation management or other actions (such as instream habitat improvement) to support sustainable populations of native aquatic, avian, and terrestrial wildlife species.</p> <p><b>Primitive Area:</b><br/>Maintain, enhance, and/or restore native habitat through vegetation management or other actions to support sustainable populations of native aquatic, avian, and terrestrial wildlife species, prioritizing natural processes and techniques over other methods.</p> |
| 96.     | <p><b>Management Direction:</b><br/>No similar management direction.</p>  | <p><b>Management Direction:</b><br/>Avoid adverse impacts on aquatic, avian, and terrestrial species habitat, connectivity, and movement. Where adverse impacts cannot be avoided, ensure project design features would reduce loss of native habitat, connectivity, and movement.</p> |  |   | <p><b>Management Direction:</b><br/>No similar management direction.</p>   | <p><b>Management Direction:</b><br/>Manage habitats for the recovery or reestablishment of native populations (MMP 2000).</p>   | <p><b>Management Direction:</b><br/>Avoid adverse impacts on aquatic, avian, and terrestrial species habitat, connectivity, and movement. Where adverse impacts cannot be avoided, ensure project design features would reduce loss of native habitat, connectivity, and movement.</p>  |

| Row No. | Alternative A  | Alternative B   | Alternative C | Alternative D  | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP  |
|---------|--|---|---------------|--|--|---|--|
| -       | <b>FISH AND WILDLIFE</b>   |   |               |  | <b>Not for analysis. For comparison only.</b>  |   | -  |
| 97.     | <p><b>Management Direction:</b><br/>Allow introduction, transplant, augmentation, and <b>reestablishment</b> of native and naturalized fish and wildlife species in cooperation and collaboration with UDWR, subject to current policy. Allow removal of unwanted nonnative wildlife species.</p>  | <p><b>Management Direction:</b><br/>Foster self-sustaining populations of native aquatic, avian, and terrestrial species and associated ecosystems through augmentation, transplant, and reintroduction of native species. Nonnative species could be used in specific circumstances if they help meet identified objectives, they pose no threat to the greater ecosystem, and their use is consistent with the protection of GSENM objects.</p> |               |  | <p><b>Management Direction:</b><br/>Allow introduction, transplant, augmentation, and <b>reestablishment</b> of native and naturalized fish and wildlife species in cooperation and collaboration with UDWR, subject to current policy. Allow removal of unwanted nonnative wildlife species. (GSENM ROD 2020, KEPA ROD 2020)</p>  | <p><b>Management Direction:</b><br/>Work cooperatively with the UDWR to reestablish populations of native species to historic ranges within the boundaries of the Monument, and to take needed actions to protect and enhance the habitat of these native species (MMP 2000).</p> | <p><b>Management Direction:</b><br/>Foster self-sustaining populations of native aquatic, avian, and terrestrial species and associated ecosystems through augmentation, transplant, and reintroduction of native species. Nonnative species could be used in specific circumstances if they help meet identified objectives, they pose no threat to the greater ecosystem, and their use is consistent with the protection of GSENM objects.</p>      |
| 98.     | <p><b>Management Direction:</b><br/>Allow surface-disturbing activities, fence modification and maintenance, travel, and vegetation treatment in big-game crucial seasonal ranges, birthing habitats, and migration corridors on a basis consistent with other resource use restrictions and in accordance with the big game BMPs.</p> <ul style="list-style-type: none"> <li>• Allow surface-disturbing activities in crucial desert bighorn sheep habitat subject to BMPs and mitigation as applicable.</li> </ul> <p>Allow modifying (via smooth wire), removal (if no longer necessary), or seasonally adapting (seasonal laydown) fencing if proven to impede movement of big game through migration corridors.</p> | <p><b>Management Direction:</b><br/>Maintain and restore habitat connectivity and unrestricted native aquatic, avian, and terrestrial species movement between ecological areas, seasonal use areas, and other areas important for sustainable populations.</p> <p>Allow construction of aquatic species barriers if the benefit of nonnative species control and native species protection is greater than the loss in connectivity.</p>         |               | <p><b>Management Direction:</b><br/>Maintain, enhance, and/or restore habitat connectivity and unrestricted native aquatic, avian, and terrestrial species movement between ecological areas, seasonal use areas, and other areas important for sustainable populations.</p> <p>Allow construction of aquatic species barriers if the benefit of nonnative species control and native species protection is greater than the loss in connectivity.</p> | <p><b>Management Direction:</b><br/>Allow surface-disturbing activities, fence modification and maintenance, travel, and vegetation treatment in big-game crucial seasonal ranges, birthing habitats, and migration corridors on a basis consistent with other resource use restrictions and in accordance with the big game BMPs.</p> <ul style="list-style-type: none"> <li>• Allow surface-disturbing activities in crucial desert bighorn sheep habitat subject to BMPs and mitigation as applicable.</li> </ul> <p>Allow modifying (via smooth wire), removal (if no longer necessary), or seasonally adapting (seasonal laydown) fencing if proven to impede movement of big game through migration corridors. (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>Preserve the integrity of wildlife corridors, migration routes, and access to key forage, nesting, and spawning areas by limiting adverse impacts from development in the monument (MMP 2000).</p>  | <p><b>Management Direction:</b><br/>Maintain, enhance, and/or restore habitat connectivity and unrestricted native aquatic, avian, and terrestrial species movement between ecological areas, seasonal use areas, and other areas important for sustainable populations.</p> <p>Allow construction of aquatic species barriers if the benefit of nonnative species control and native species protection is greater than the loss in connectivity.</p> |

| Row No. | Alternative A  | Alternative B   | Alternative C   | Alternative D   | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP  |
|---------|--|---|---|---|--|--|--|
| -       | <b>FISH AND WILDLIFE</b>   |   |   |   | <b>Not for analysis. For comparison only.</b>                            |  | -  |
| 99.     | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Allow new supplemental water developments for native terrestrial species. In WSAs, allow only if developments are designed in a manner that does not reduce wilderness character or that enhances the resources for which a WSA was designated.</p> | <p><b>Management Direction:</b><br/><u>Front Country, Passage, and Outback Areas:</u> Allow new supplemental water developments for native terrestrial species if they are designed in a manner that is consistent with the protection of GSENM objects.</p> <p><u>Primitive Area:</u> Same as Alternative D.</p> | <p><b>Management Direction:</b><br/>Facilitate water availability for native terrestrial species to offset the effects of persistent drought and/or disperse native terrestrial species use to avoid disease outbreak, through the maintenance, restoration, and/or enhancement of natural waterways and wetlands.</p> <p>Only allow temporary (that is, no longer than 6 months) supplemental water developments for native terrestrial species (such as guzzlers and drinkers).</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Water developments may be constructed for wildlife purposes if consistent with the overall objectives for fish and wildlife and with the water development policy discussed in the Water section (2000 MMP).</p> | <p><b>Management Direction:</b><br/><u>All Areas:</u><br/>Maintenance of existing water developments for native wildlife may be allowed, consistent with the protection of GSENM objects.</p> <p>Modifications to existing water developments for native wildlife may be allowed, if the existing water development and its modification would be consistent with the protection of GSENM objects.</p> <p><u>Front Country, Passage, and Outback Areas:</u><br/>New water developments for native wildlife may be allowed, if the new water development and its construction would be consistent with the protection of GSENM objects.</p> <p><u>Primitive Area:</u><br/>Prioritize providing water for native wildlife through the maintenance, restoration, and/or enhancement of natural water sources. New water developments for native wildlife may be allowed, if the new water development and its construction would protect and enhance GSENM objects.</p> |

| Row No. | Alternative A  | Alternative B   | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan   | Alternative E 2024 Proposed RPM   |
|---------|--|---|---------------|---------------|---|---|---|
| -       | <b>SPECIAL STATUS SPECIES</b>  |   |               |               | <b>Not for analysis. For comparison only.</b>   |   | -   |
| 100.    | <b>Goal:</b><br>Maintain, protect, enhance, and recover habitats and populations of federally listed threatened, endangered, proposed, or candidate plant, animal, or fish species, and actively promote recovery to the point that provisions of the Endangered Species Act (ESA) are no longer required.             | <b>Goal:</b><br>Ensure that special status species (BLM Utah sensitive and federally listed threatened, endangered, proposed, or candidate plant, animal, or fish species) are recovering and support sustainable populations and the diversity of habitats in GSENM.   |               |               | <b>Goal:</b><br>Maintain, protect, enhance, and recover habitats and populations of federally listed threatened, endangered, proposed, or candidate plant, animal, or fish species, and actively promote recovery to the point that provisions of the ESA are no longer required. (GSENM ROD 2020, KEPA ROD 2020)   | <b>Goal:</b><br>No similar goal.  | <b>Goal:</b><br>Ensure that special status species (BLM Utah sensitive and federally listed threatened, endangered, proposed, or candidate plant and animal species) are recovering and support sustainable populations and the diversity of habitats in GSENM.   |
| 101.    | <b>Objective:</b><br>No similar objective.   | <b>Objective:</b><br>Protect and recover special status species (BLM Utah sensitive and federally listed threatened, endangered, proposed, or candidate plant, animal, or fish species) habitats and populations. Actively promote recovery to the point that provisions of the ESA are no longer required or to avoid a need to list them under the ESA. |               |               | <b>Objective:</b><br>No similar objective.  | <b>Objective:</b><br>The BLM will continue to ensure that authorized actions do not jeopardize the continued existence of any special status animal species or result in the destruction or adverse modification of critical habitats (2000 MMP). | <b>Objective:</b><br>Protect and recover special status species (BLM Utah sensitive and federally listed threatened, endangered, proposed, or candidate plant and animal species) habitats and populations. Actively promote recovery to the point that provisions of the ESA are no longer required or to avoid a need to list them under the ESA. |
| 102.    | <b>Objective:</b><br>Develop and implement conservation measures to minimize long-term habitat fragmentation and maintain habitat connectivity through avoidance and site-specific reclamation to provide the habitat quality and quantity to meet ecological requirements and support a natural diversity of species. | <b>Objective:</b><br>No similar objective.  |               |               | <b>Objective:</b><br>Develop and implement conservation measures to minimize long-term habitat fragmentation and maintain habitat connectivity through avoidance and site-specific reclamation in order to provide the habitat quality and quantity to meet ecological requirements and support a natural diversity of species. (GSENM ROD 2020, KEPA ROD 2020) | <b>Objective:</b><br>No similar objective.  | <b>Objective:</b><br>No similar objective.  |

| Row No. | Alternative A  | Alternative B  | Alternative C   | Alternative D   | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan   | Alternative E 2024 Proposed RPM  |
|---------|--|--|---|---|--|---|--|
| -       | <b>SPECIAL STATUS SPECIES</b>                                    |  |   |   | <b>Not for analysis. For comparison only.</b>                    |   | -  |
| 103.    | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Ensure that all management actions support the protection of special status species and their habitats.<br><br>Avoid adverse impacts on special status species habitat, connectivity, and movement. Where adverse effects cannot be avoided, ensure adverse impacts are short term or would lead to an overall species benefit in the long term. |   |   | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>Ensure that all management actions support the protection of special status species and their habitats.<br><br>Avoid adverse impacts on special status species habitat, connectivity, and movement. Where adverse effects cannot be avoided, ensure adverse impacts are short term or would lead to an overall species benefit in the long term.   |
| 104.    | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Maintain and restore native habitat through vegetation management or other actions to support sustainable populations of special status species.   | <b>Management Direction:</b><br><u>Front, Passage, and Outback Areas:</u><br>Same as Alternative B.<br><br><u>Primitive Area:</u><br>Same as Alternative D. | <b>Management Direction:</b><br>Maintain, enhance, and/or restore native habitat through vegetation management or other actions to support sustainable populations of special status species, prioritizing natural processes and techniques over other methods. | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Vegetation Restoration methods (as described in the Vegetation section) will not be allowed in areas where special status species roost or nest (unless consultation with USFWS indicates no effect or a beneficial effect to species). | <b>Management Direction:</b><br><u>Front, Passage, and Outback Areas:</u><br>Maintain and restore native habitat through vegetation management or other actions to support sustainable populations of special status species.<br><br><u>Primitive Area:</u><br>Maintain, enhance, and/or restore native habitat through vegetation management or other actions to support sustainable populations of special status species, prioritizing natural processes and techniques over other methods. |

| Row No. | Alternative A  | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RPM  |
|---------|--|--|---------------|---------------|--|--|--|
| -       | <b>SPECIAL STATUS SPECIES</b>  |  |               |               | <b>Not for analysis. For comparison only.</b>  |  | -  |
| 105.    | <b>Management Direction:</b><br>No similar management direction.   | <b>Management Direction:</b><br>Maintain and restore habitat connectivity and unrestricted special status species movement between ecological areas, seasonal use areas, and other areas important for sustainable populations.<br><br>Allow construction of aquatic organism barriers if the benefit of nonnative species control and special status species protection is greater than the loss in connectivity. |               |               | <b>Management Direction:</b><br>No similar management direction.   | <b>Management Direction:</b><br>No similar management direction.   | <b>Management Direction:</b><br>Maintain and restore habitat connectivity and unrestricted special status species movement between ecological areas, seasonal use areas, and other areas important for sustainable populations.<br><br>Allow construction of aquatic organism barriers if the benefit of nonnative species control and special status species protection is greater than the loss in connectivity.                                     |
| 106.    | <b>Management Direction:</b><br>If recreational activities (such as hiking, camping, backpacking, rappelling, rock climbing, and canyoneering) are determined to disrupt or result in abandonment of known roost or nest sites for special status bird species, reduce impacts through visitor allocations, group size restrictions, or other measures. Apply visitor allocations and group size restrictions in accordance with recreation decisions. |  |               |               | <b>Management Direction:</b><br>If recreation activities (such as hiking, camping, backpacking, rappelling, rock climbing, canyoneering) are determined to disrupt or result in abandonment of known roost or nest sites for special status bird species, reduce impacts through visitor allocations, group size restrictions, or other measures. Apply visitor allocations and group size restrictions in accordance with Recreation decisions. (GSENM ROD 2020, KEPA ROD 2020) | <b>Management Direction:</b><br>If recreation activities (such as hiking, camping, backpacking) are determined to impact known nest sites, allocations and/or group size restrictions or other measures will be implemented to reduce disturbance. If allocations and group size limits are implemented, they will be developed in accordance with the Group Size and Recreation Allocation provisions in this Plan. | <b>Management Direction:</b><br>If recreational activities (such as hiking, camping, backpacking, rappelling, rock climbing, and canyoneering) are determined to disrupt or result in abandonment of known roost or nest sites for special status bird species, reduce impacts through visitor allocations, group size restrictions, or other measures. Apply visitor allocations and group size restrictions in accordance with recreation decisions. |
| 107.    | <b>Management Direction:</b><br>Allow surface-disturbing activities within habitat for special status species using appropriate buffers and seasons.   | <b>Management Direction:</b><br>No similar management direction.   |               |               | <b>Management Direction:</b><br>Allow surface-disturbing activities within habitat for special status species using appropriate buffers and seasons. (GSENM ROD 2020, KEPA ROD 2020)   | <b>Management Direction:</b><br>Surface-disturbing research activities will generally not be allowed in threatened or endangered species habitat.  | <b>Management Direction:</b><br>No similar management direction.   |



| Row No. | Alternative A   | Alternative B  | Alternative C | Alternative D   | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan   | Alternative E 2024 Proposed RPM  |
|---------|---|--|---------------|---|--|---|--|
| -       | <b>SPECIAL STATUS SPECIES</b>   |  |               |   | <b>Not for analysis. For comparison only.</b>  |   | -  |
| 108.    | <b>Management Direction:</b><br>Avoid new ROWs and communication sites in special status species habitat and applicable buffers where suitable alternatives exist.  | <b>Management Direction:</b><br>Manage designated critical habitat that contain the physical and biological features necessary for listed species as ROW avoidance, except in areas identified as open for ROW location (see <i>Lands and Realty</i> ).  |               | <b>Management Direction:</b><br>Manage designated critical habitat as ROW exclusion, except in areas identified as open for ROW location (see <i>Lands and Realty</i> ).                          | <b>Management Direction:</b><br>Avoid new ROWs and communication sites in special status species habitat and applicable buffers where suitable alternatives exist. (GSENM ROD 2020, KEPA ROD 2020)   | <b>Management Direction:</b><br>Communication sites, utility ROWs, and road ROWs will not be permitted in known special status species populations. As permits are granted for these sites and ROWs, surveys will be completed to determine the presence of special status species in the area. If they are found, these activities will be moved to another location.  | <b>Management Direction:</b><br>Manage designated critical habitat that contains the physical and biological features necessary for listed species as ROW avoidance, except in areas identified as open for ROW location (see <i>Lands and Realty</i> ). |
| 109.    | <b>Management Direction:</b><br>Establish seasonal closures for rock climbing in occupied nesting areas for California condor, golden eagle, Mexican spotted owl, and peregrine falcon during periods of occupancy.   | <b>Management Direction:</b><br>Establish seasonal closures for habitat altering or other activities that are known to cause disturbances to nesting raptors in occupied nesting areas for California condor, golden eagle, Mexican spotted owl, and peregrine falcon during periods of occupancy. |               |   | <b>Management Direction:</b><br>Establish seasonal closures for rock climbing in occupied nesting areas for California condor, golden eagle, Mexican spotted owl, and peregrine falcon during periods of occupancy. (GSENM ROD 2020, KEPA ROD 2020)  | <b>Management Direction:</b><br>Establish criteria for designation of rock-climbing areas. These criteria will not allow climbing areas to be designated in known peregrine falcon or Mexican spotted owl nest sites. If new sites are identified as occupied for nesting in areas designated for climbing, seasonal closures will be established in those areas to ensure that disturbance of nesting activities does not occur. | <b>Management Direction:</b><br>To protect special status species, establish seasonal closures, as necessary, for activities that alter habitat or otherwise disturb those species.  |
| 110.    | <b>Management Direction:</b><br>Allow surface use or disruptive activities within 0.5 miles of occupied California condor roosts or 1 mile of occupied nests only if (1) the activity is consistent and compatible with protection, maintenance, or enhancement of the habitat and populations or (2) the activity is relocated or redesigned to eliminate or reduce detrimental impacts. | <b>Management Direction:</b><br>Protect California condors by avoiding surface use or activities that are known to cause disturbances to nesting raptors within 0.5 miles of occupied California condor roosts or 1 mile of occupied nests.  |               | <b>Management Direction:</b><br>Protect California condors by prohibiting surface use or disruptive activities within 0.5 miles of occupied California condor roosts or 1 mile of occupied nests. | <b>Management Direction:</b><br>Allow surface use or disruptive activities within 0.5 miles of occupied California condor roosts or 1 mile of occupied nests only if (1) the activity is consistent and compatible with protection, maintenance, or enhancement of the habitat and populations, or (2) the activity is relocated or redesigned to eliminate or reduce detrimental impacts. (GSENM ROD 2020, KEPA ROD 2020) | <b>Management Direction:</b><br>Although Section 7 consultation is not required for this species, the USFWS and the BLM agree that it is appropriate and desirable to discuss this species. Efforts will be made to protect potential habitat for this species and to limit activities which may be detrimental to their existence in cooperation with the counties and the USFWS.  | <b>Management Direction:</b><br>Protect California condors by avoiding surface use or activities that are known to cause disturbances to nesting raptors within 0.5 miles of occupied California condor roosts or 1 mile of occupied nests.              |

| Row No. | Alternative A   | Alternative B   | Alternative C  | Alternative D  | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan  | Alternative E 2024 Proposed RPM  |
|---------|---|---|--|--|---|--|--|
| -       | <b>SPECIAL STATUS SPECIES</b>   |   |  |  | <b>Not for analysis. For comparison only.</b>   |  | -  |
| 111.    | <p><b>Management Direction:</b><br/>Allow development and maintenance of recreation and administrative facilities in Mexican spotted owl protected activity centers outside the breeding season if (1) the activity is consistent and compatible with protection, maintenance, or enhancement of the habitat and populations or (2) the activity is relocated or redesigned to eliminate or reduce detrimental impacts.</p> | <p><b>Management Direction:</b><br/>Development and maintenance of recreation and administrative facilities may be authorized in Mexican spotted owl protected activity centers outside the breeding season if (1) the activity is consistent and compatible with protection, maintenance, or enhancement of the habitat and populations or (2) the activity is relocated or redesigned to eliminate or reduce detrimental impacts.</p> | <p><b>Management Direction:</b><br/><u>Front Country and Passage Areas:</u><br/>Same as Alternative B.</p> <p><u>Outback and Primitive Areas:</u><br/>Same as Alternative D.</p> | <p><b>Management Direction:</b><br/>Prohibit new built infrastructure or facilities in Mexican spotted owl protected activity centers.</p> | <p><b>Management Direction:</b><br/>Allow development and maintenance of recreation and administrative facilities in Mexican spotted owl protected activity centers outside of the breeding season if (1) the activity is consistent and compatible with protection, maintenance, or enhancement of the habitat and populations, or (2) the activity is relocated or redesigned to eliminate or reduce detrimental impacts. (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/><u>Front Country and Passage Areas:</u><br/>Development and maintenance of recreation and administrative facilities may be authorized in Mexican spotted owl protected activity centers outside the breeding season if (1) the activity is consistent with the protection of habitat and populations, or (2) the activity is relocated or redesigned to eliminate or reduce detrimental impacts.</p> <p><u>Outback and Primitive Areas:</u><br/>Prohibit new built infrastructure or facilities in Mexican spotted owl protected activity centers.</p> |

| Row No. | Alternative A  | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RPM  |
|---------|--|--|---------------|---------------|--|--|--|
| -       | <b>SPECIAL STATUS SPECIES</b>  |  |               |               | <b>Not for analysis. For comparison only.</b>                            |  | -  |
| 112.    | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Groups sizes are limited to 12, and overnight camping is prohibited in Mexican spotted owl protected activity centers during the breeding and nesting season (March 1 to August 31).</p> <p>Canyoneering or rappelling within protected activity centers during the breeding/nesting season (March 1 to August 31) requires that participants stay within the canyon bottom and not enter or exit the canyon via canyon walls or other areas that could possibly disrupt breeding and nesting Mexican spotted owl.</p> |               |               | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Spotted owls and their habitat within the Monument will be protected from impacts which might contribute to their decline and actions which promote recovery and conservation will be encouraged (2000 MMP).<br/>The BLM will designate protected activity centers in accordance with the recovery plan. Activities such as recreational use in these protected areas may be limited (as described in SSA-18) to help protect this species (2000 MMP).<br/>Trail construction will generally be limited to the front country and passage zones. Project-level assessments and consultation with the USFWS will be completed before construction of any trails that are in close proximity to owl nest sites. Designated primitive camping areas, picnic areas, and trailheads will not be located within 1/2 mile of known spotted owl nesting, unless consultation with USFWS determines that impacts to nesting birds will not occur. This 1/2-mile buffer is recommended in the "Utah Field Guide for Raptor Protection from Human and Land Use Disturbances" (USFWS 1999) (2000 MMP).<br/>Criteria for designation of climbing areas will be established for the Monument. These criteria will not allow climbing areas to be designated in known Mexican spotted owl nest sites. If new nest sites are identified in areas designated for climbing, seasonal closures will be established in those areas to assure that disturbance of nesting activities does not occur.</p> | <p><b>Management Direction:</b><br/>Within Mexican spotted owl protected activity centers during the breeding and nesting season (March 1 to August 31):</p> <ul style="list-style-type: none"> <li>• Canyon walls cannot be used for either access or exit.</li> <li>• Canyoneering, rappelling, and rock climbing must occur entirely within canyon bottoms.</li> <li>• Group sizes are limited to 12, and overnight camping is prohibited.</li> </ul> |

| Row No. | Alternative A   | Alternative B   | Alternative C | Alternative D  | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan   | Alternative E 2024 Proposed RPM   |
|---------|---|---|---------------|--|---|---|---|
| -       | <b>SPECIAL STATUS SPECIES</b>   |   |               |  | <b>Not for analysis. For comparison only.</b>   |   | -   |
| 113.    | <p><b>Management Direction:</b><br/>Allow surface-disturbing activities within occupied breeding habitat between June 1 and August 31 for western yellow-billed cuckoo and between April 15 and August 15 for southwestern willow flycatcher if after site-specific analysis and consultation with the USFWS it is determined that the activity would not adversely affect either the birds or their habitat.</p> | <p><b>Management Direction:</b><br/>Protect western yellow-billed cuckoo and southwestern willow flycatcher by avoiding habitat altering activities within occupied habitat during the primary breeding/nesting season (April 1 to July 1).</p> |               | <p><b>Management Direction:</b><br/>Protect western yellow-billed cuckoo and southwestern willow flycatcher by prohibiting habitat altering activities within occupied habitat during the primary breeding/nesting season (April 1 to July 1).</p> | <p><b>Management Direction:</b><br/>Allow surface-disturbing activities within occupied breeding habitat between June 1 and August 31 for western yellow-billed cuckoo and between April 15 and August 15 for southwestern willow flycatcher if after site-specific analysis and consultation with the USFWS it is determined that the activity would not adversely affect either the birds or their habitat. (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>A comprehensive inventory for southwestern willow flycatcher populations in the Monument was begun in 1999. This is a multiyear project that will look at occurrence of southwestern willow flycatchers, current habitat, and habitat that has potential if modifications are made. This inventory will help to identify some of the impacts that are occurring in the area, which will help the BLM determine when and where limits on activities (such as recreational use) need to be implemented to protect the southwestern willow flycatcher.</p> | <p><b>Management Direction:</b><br/>Protect western yellow-billed cuckoo and southwestern willow flycatcher by prohibiting habitat altering activities within occupied habitat during the primary breeding/nesting season (April 1 to July 1), unless other mitigation actions would provide similar protection to the species, following consultation with the USFWS.</p>    |
| 114.    | <p><b>Management Direction:</b><br/>Prohibit fuelwood cutting in habitat for federally listed special status plant species. Allow noncommercial fuelwood cutting in habitat for BLM sensitive plant with appropriate conservation measures to mitigate impacts as determined during site-specific assessments of proposed projects.</p>   | <p><b>Management Direction:</b><br/>Allow vegetation management and noncommercial fuelwood harvest with seasonal or breeding restrictions if it protects, restores, and/or enhances habitat for special status species.</p>                     |               |  | <p><b>Management Direction:</b><br/>Prohibit fuelwood cutting in habitat for federally listed special status plant species. Allow fuelwood cutting in habitat for BLM sensitive plant with appropriate conservation measures to mitigate impacts as determined during site-specific assessments of proposed projects. (GSENM ROD 2020, KEPA ROD 2020)</p>   | <p><b>Management Direction:</b><br/>Future fuelwood cutting areas will not be designated in listed plant populations (see the Forestry Products section for related decisions).</p>   | <p><b>Management Direction:</b><br/>Allow vegetation management and noncommercial fuelwood harvest, consistent with the protection of GSENM objects and in accordance with the Forestry and Woodland Products section of this RMP and applicable law, with seasonal or breeding restrictions if they protect, restore, and/or enhance habitat for special status species.</p> |

| Row No. | Alternative A  | Alternative B   | Alternative C | Alternative D   | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan   | Alternative E 2024 Proposed RPM  |
|---------|--|---|---------------|---|--|---|--|
| -       | <b>SPECIAL STATUS SPECIES</b>  |   |               |   | <b>Not for analysis. For comparison only.</b>  |   | -  |
| 115.    | <p><b>Management Direction:</b><br/>Prohibit surface-disturbing activities in federally listed plant species habitat unless (1) the activity enhances scientific understanding of the species and (2) appropriate approvals and permits are obtained from the BLM and USFWS.</p> | <p><b>Management Direction:</b><br/>Avoid discretionary activities in special status species habitat that would adversely impact those species, unless the activity is designed to and would protect and restore the habitat.</p> |               | <p><b>Management Direction:</b><br/>Prohibit discretionary activities in special status species habitat that would adversely impact those species, unless the activity is designed to and would protect, restore, and/or enhance the habitat.</p> | <p><b>Management Direction:</b><br/>Prohibit surface-disturbing activities in federally listed plant species habitat unless (1) the activity enhances scientific understanding of the species and (2) appropriate approvals and permits are obtained from the BLM and USFWS. (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>Surface-disturbing research activities will generally not be allowed in threatened or endangered plant species habitat. All scientific research projects in close proximity to listed species populations or habitat will be evaluated by Monument biologists, the USFWS, and appropriate experts prior to initiation to determine impacts to these populations or habitat. Any research project which may have an effect on populations of listed species will be coordinated with the USFWS and appropriate permits and Section 7 consultation will be completed as determined necessary. Projects which provide new information and understanding of listed species, their populations and/or their habitat, may be allowed after approval by the BLM and the review and issuance of permits by the USFWS. All projects will be evaluated on a case-by-case basis.</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> |

| Row No. | Alternative A   | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RPM  |
|---------|---|--|---------------|---------------|--|--|--|
| -       | <b>SPECIAL STATUS SPECIES</b>   |  |               |               | <b>Not for analysis. For comparison only.</b>  |  | -  |
| 116.    | <p><b>Management Direction:</b><br/>Prohibit reseeding or surface-disturbing restoration activities after fires in known special status plant species habitat. For federally listed species, reseeding or surface-disturbing restoration activities after fires would be prohibited unless consultation with the USFWS indicates these measures are necessary for the protection and/or recovery of listed species. (GSENM ROD 2020)<br/>Allow reseeding or surface-disturbing restoration activities after fires in known special status plant species habitat if determined acceptable through consultation with the USFWS. (KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>No similar management direction</p>  |               |               | <p><b>Management Direction:</b><br/>In the former GSENM boundary:<br/>Prohibit reseeding or surface-disturbing restoration activities after fires in known special status plant species habitat unless consultation with the USFWS indicates these measures are necessary for the protection and/or recovery of listed species. (GSENM ROD 2020)<br/>In the former KEPA boundary:<br/>Allow reseeding or surface-disturbing restoration activities after fires in known special status plant species habitat if determined acceptable through consultation with the USFWS. (KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>Prohibit reseeding or surface-disturbing restoration activities after fires in areas with special status plant species. Natural diversity and vegetation structure will provide adequate regeneration.</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> |
| 117.    | <p><b>Management Direction:</b><br/>Prohibit prescribed fires in known special status plant species habitat. For federally listed species, prescribed fires would be prohibited unless consultation with the USFWS indicates that fire is necessary for the protection and/or recovery of listed species. (GSENM ROD 2020)<br/><br/>Allow prescribed fires in known special status plant species habitat if determined acceptable through consultation with the USFWS. (KEPA ROD 2020)</p>  | <p><b>Management Direction:</b><br/>No similar management direction.</p> |               |               | <p><b>Management Direction:</b><br/>In the former GSENM boundary:<br/>Prohibit prescribed fires in known special status plant species habitat unless consultation with the USFWS indicates that fire is necessary for the protection and/or recovery of listed species. (GSENM ROD 2020)<br/><br/>In the former KEPA boundary:<br/>Allow prescribed fires in known special status plant species habitat if determined acceptable through consultation with the USFWS. (KEPA ROD 2020)</p>  | <p><b>Management Direction:</b><br/>Prohibit management-ignited fires in areas with special status plant species unless consultation with USFWS indicates that fire is necessary for the protection and/or recovery of listed species.</p>     | <p><b>Management Direction:</b><br/>No similar management direction.</p> |

| Row No. | Alternative A  | Alternative B  | Alternative C   | Alternative D   | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan  | Alternative E 2024 Proposed RPM  |
|---------|--|--|---|---|---|--|--|
| -       | <b>SPECIAL STATUS SPECIES</b>  |  |   |   | <b>Not for analysis. For comparison only.</b>   |  | -  |
| 118.    | <p><b>Management Direction:</b><br/>Avoid expansion or development of new trails, parking areas, or other recreation facilities in habitat for federally listed plant species. (GSENM ROD 2020)</p> <p>Allow expansion or development of new trails, parking areas, or other recreation facilities in habitat for federally listed plant species if determined acceptable through consultation with the USFWS. (KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>No similar management direction</p>  | <p><b>Management Direction:</b><br/>No similar management direction</p> | <p><b>Management Direction:</b><br/>No similar management direction</p> | <p><b>Management Direction:</b><br/>In the former GSENM boundary:<br/>Avoid expansion or development of new trails, parking areas, or other recreation facilities in habitat for federally listed plant species. (GSENM ROD 2020)</p> <p>In the former KEPA boundary:<br/>Allow expansion or development of new trails, parking areas, or other recreation facilities in habitat for federally listed plant species if determined acceptable through consultation with the USFWS. (KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>Prohibit trails, parking areas, or other recreation facilities in any federally listed plant species population.</p>   | <p><b>Management Direction:</b><br/>No similar management direction.</p>   |
| 119.    | <p><b>Management Direction:</b><br/>Apply treatments to control outbreaks or establishment of noxious weed species in all areas (including special status species plants) in coordination with local cooperative weed management partnership.</p>  | <p><b>Management Direction:</b><br/>Apply treatments to control outbreaks or establishment of noxious weed species in all areas (including special status species as long as appropriate mitigation measures are used to protect those species).</p> |   |   | <p><b>Management Direction:</b><br/>Apply treatments to control outbreaks or establishment of noxious weed species in all areas (including special status species plants) in coordination with local cooperative weed management partnership. (GSENM ROD 2020, KEPA ROD 2020)</p>   | <p><b>Management Direction:</b><br/>Areas with threatened or endangered plants will be targeted for noxious weed-control activities as a first priority. BLM employees or contractors with appropriate certification will be responsible for use of chemicals in noxious weed removal efforts and will take precautions to prevent possible effects to non-target species.</p> | <p><b>Management Direction:</b><br/>Apply treatments to control outbreaks or establishment of noxious weed species in all areas (including special status species as long as appropriate mitigation measures are used to protect those species).</p> |
| 120.    | <p><b>Management Direction:</b><br/>No similar management direction.</p>   | <p><b>Management Direction:</b><br/>Prohibit the use of chemical substances that may affect the Colorado pikeminnow or the razorback sucker downstream habitat.</p>  |   |   | <p><b>Management Direction:</b><br/>No similar management direction.</p>  | <p><b>Management Direction:</b><br/>Use of chemical substances that may affect the Colorado pikeminnow or the razorback sucker downstream habitat may not be used.</p>   | <p><b>Management Direction:</b><br/>Prohibit the use of chemical substances that would adversely affect the Colorado pikeminnow or the razorback sucker downstream habitat.</p>  |

| Row No. | Alternative A   | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan   | Alternative E 2024 Proposed RPM  |
|---------|---|--|---------------|---------------|--|---|--|
| -       | <b>SPECIAL STATUS SPECIES</b>   |  |               |               | <b>Not for analysis. For comparison only.</b>  |   | -  |
| 121.    | <p><b>Management Direction:</b><br/>Avoid surface-disturbing activities within 330 feet or habitat-fragmenting activities within 660 feet of potential, suitable, and occupied special status plant habitat. Allow surface-disturbing activities within 330 feet or habitat-fragmenting activities within 660 feet of potential, suitable, and occupied special status plant habitat only if (1) the activity is consistent and compatible with protection, maintenance, or enhancement of the habitat and populations as outlined in recovery and conservation plans and when such actions would not lead to the need to list the plant, or (2) the activity is relocated or redesigned to eliminate or reduce detrimental impacts to acceptable limits. (GSENM ROD 2020)</p> <p>Allow surface-disturbing activities in occupied special status plant habitat with appropriate mitigation or in occupied listed species habitat after consultation with the USFWS during site-specific permitting. (KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> |               |               | <p><b>Management Direction:</b><br/>In the former GSENM boundary: Avoid surface-disturbing activities within 330 feet or habitat-fragmenting activities within 660 feet of potential, suitable, and occupied special status plant habitat. Allow surface-disturbing activities within 330 feet or habitat-fragmenting activities within 660 feet of potential, suitable, and occupied special status plant habitat only if (1) the activity is consistent and compatible with protection, maintenance, or enhancement of the habitat and populations as outlined in recovery and conservation plans and when such actions would not lead to the need to list the plant, or (2) the activity is relocated or redesigned to eliminate or reduce detrimental impacts to acceptable limits. (GSENM ROD 2020)</p> <p>In the former KEPA boundary: Allow surface-disturbing activities in occupied special status plant habitat with appropriate mitigation or in occupied listed species habitat after consultation with the USFWS during site-specific permitting. (KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>Surface-disturbing research activities will generally not be allowed in threatened or endangered plant species habitat. All scientific research projects in close proximity to listed species populations or habitat will be evaluated by Monument biologists, the USFWS, and appropriate experts prior to initiation to determine impacts to these populations or habitat. Any research project which may have an effect on populations of listed species will be coordinated with the USFWS and appropriate permits and Section 7 consultation will be completed as determined necessary. Projects which provide new information and understanding of listed species, their populations and/or their habitat, may be allowed after approval by the BLM and the review and issuance of permits by the USFWS. All projects will be evaluated on a case-by-case basis.</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> |



| Row No. | Alternative A   | Alternative B   | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan   | Alternative E 2024 Proposed RPM   |
|---------|---|---|---------------|---------------|---|---|---|
| -       | <b>SPECIAL STATUS SPECIES</b>   |   |               |               | <b>Not for analysis. For comparison only.</b>   |   | -   |
| 122.    | <p><b>Management Direction:</b><br/>                     Avoid surface-disturbing activities within 330 feet of special status fish species habitat. Allow surface-disturbing activities within 330 feet of special status fish species habitat only if (1) impacts from the proposed action can be adequately mitigated, or (2) the action will benefit the species and/or habitat, and (3) after a site-specific analysis and consultation with the USFWS as appropriate.</p> | <p><b>Management Direction:</b><br/>                     No similar management direction.</p> |               |               | <p><b>Management Direction:</b><br/>                     Avoid surface-disturbing activities within 330 feet of special status fish species habitat. Allow surface-disturbing activities within 330 feet of special status fish species habitat only if (1) impacts from the proposed action can be adequately mitigated, or (2) the action will benefit the species and/or habitat, and (3) after a site-specific analysis and consultation with the USFWS as appropriate. (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>                     No similar management direction.</p> | <p><b>Management Direction:</b><br/>                     No similar management direction.</p> |

| Row No. | Alternative A  | Alternative B  | Alternative C  | Alternative D  | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP  |
|---------|--|--|--|--|---|---|--|
| -       | <b>VISUAL RESOURCES</b>  |  |  |  | <b>Not for analysis. For comparison only.</b>   |   | -  |
| 123.    | <b>Goal:</b><br>Manage uses to protect and maintain the quality of the scenic values.  | <b>Goal:</b><br>Protect the quality of scenic values.  |  |  | <b>Goal:</b><br>Manage uses to protect and maintain the quality of the scenic values. (GSENM ROD 2020, KEPA ROD 2020)   | <b>Goal:</b><br>No similar goal.  | <b>Goal:</b><br>Protect the quality of scenic values.  |
| 124.    | <b>Goal:</b><br>Increase public awareness and appreciation of and engagement with scenic resources.  | <b>Goal:</b><br>No similar goal.   |  |  | <b>Goal:</b><br>Increase public awareness and appreciation of and engagement with scenic, night sky, and natural soundscape resources. (GSENM ROD 2020, KEPA ROD 2020)  | <b>Goal:</b><br>No similar goal.  | <b>Goal:</b><br>No similar goal.   |
| 125.    | <b>Objective:</b><br>Manage lands according to the assigned VRM class objective:<br><ul style="list-style-type: none"> <li>VRM Class I – Preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.</li> <li>VRM Class II – Retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but they should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.</li> <li>VRM Class III – Partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention, but they should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.</li> </ul> | <b>Objective:</b><br>Manage lands according to the assigned VRM class objective:<br><ul style="list-style-type: none"> <li>VRM Class I – Preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.</li> <li>VRM Class II – Retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but they should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.</li> <li>VRM Class III – Partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention, but they should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.</li> </ul> | <b>Objective:</b><br>Manage lands according to the assigned VRM class objective:<br><ul style="list-style-type: none"> <li>VRM Class I – Preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.</li> <li>VRM Class II – Retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but they should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.</li> <li>VRM Class III – Partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention, but they should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.</li> </ul> | <b>Objective:</b><br>Manage lands according to the assigned VRM class objective:<br><ul style="list-style-type: none"> <li>VRM Class I – Preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.</li> <li>VRM Class II – Retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but they should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.</li> <li>VRM Class III – Partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention, but they should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.</li> </ul> | <b>Objective:</b><br>Assign one of the following VRM Objectives to all lands within the planning area to allow for a range of visual value protection and resource use (GSENM ROD 2020, KEPA ROD 2020):<br><ul style="list-style-type: none"> <li>VRM Class I – Preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.</li> <li>VRM Class II – Retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but they should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.</li> <li>VRM Class III – Partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention, but they should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.</li> </ul> | <b>Objective:</b><br>The VRM class objectives are as follows:<br><ul style="list-style-type: none"> <li>Class II: The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.</li> <li>Class III: The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.</li> </ul> <p>If areas are designated as Wilderness or designated a wild</p> | <b>Objective:</b><br>Manage lands according to the assigned VRM class objective:<br><ul style="list-style-type: none"> <li>VRM Class I – Preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.</li> <li>VRM Class II – Retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but they should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.</li> <li>VRM Class III – Partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention, but they should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.</li> </ul> |

| Row No.      | Alternative A   | Alternative B  | Alternative C   | Alternative D   | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP   |
|--------------|---|--|---|---|---|--|---|
| -            | <b>VISUAL RESOURCES</b>   |  |   |   | <b>Not for analysis. For comparison only.</b>   |  | -   |
| 125. (cont.) | <p>character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention, but they should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.</p> <ul style="list-style-type: none"> <li>VRM Class IV – Provide for management activities that require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.</li> </ul> | (see above)  |   | (see above)   | <p>to the characteristic landscape should be moderate. Management activities may attract attention, but they should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.</p> <ul style="list-style-type: none"> <li>VRM Class IV – Provide for management activities that require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.</li> </ul> | <p>section of a National Wild and Scenic River, they will be reassigned to VRM Class I.</p>  | <p>should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.</p>   |
| 126.         | <p><b>Allocation:</b><br/>Allocate GSENM to the following VRM Classes:</p> <ul style="list-style-type: none"> <li>VRM Class I: 881,100 acres</li> <li>VRM Class II: 422,300 acres</li> <li>VRM Class III: 346,500 acres</li> <li>VRM Class IV: 215,700 acres</li> </ul>   | <p><b>Allocation:</b><br/>Allocate GSENM to the following VRM Classes:</p> <ul style="list-style-type: none"> <li>VRM Class I (958,200 acres) <ul style="list-style-type: none"> <li>WSAs</li> <li>Wild WSR suitable segments (including a 0.5-mile corridor)</li> <li>Lands with wilderness characteristics managed to protect those characteristics</li> </ul> </li> </ul> | <p><b>Allocation:</b><br/>Allocate GSENM to the following VRM Classes:</p> <ul style="list-style-type: none"> <li>VRM Class I (1,125,400 acres) <ul style="list-style-type: none"> <li>WSAs</li> <li>Wild WSR suitable segments (including a 0.5-mile corridor)</li> <li>Lands with wilderness characteristics in the primitive area</li> </ul> </li> </ul> | <p><b>Allocation:</b><br/>Allocate GSENM to the following VRM Classes:</p> <ul style="list-style-type: none"> <li>VRM Class I (1,443,900 acres) <ul style="list-style-type: none"> <li>WSAs</li> <li>Wild WSR suitable segments (including at 0.5-mile corridor)</li> <li>Lands with wilderness characteristics managed to protect those characteristics</li> </ul> </li> </ul> | <p><b>Allocation:</b><br/>Allocate the former GSENM and KEPA to the following VRM Classes:</p> <ul style="list-style-type: none"> <li>VRM Class I: 881,100 acres</li> <li>VRM Class II: 422,300 acres</li> <li>VRM Class III: 346,500 acres</li> <li>VRM Class IV: 215,700 acres (GSENM ROD 2020, KEPA ROD 2020)</li> </ul>   | <p><b>Allocation:</b><br/>Utilizing the results of the visual resource inventory and other resource allocation considerations, 68 percent of the lands within the Monument will be assigned to VRM Class II and 32 percent of the lands within the Monument will be assigned to VRM Class III.</p> | <p><b>Allocation:</b><br/>Allocate GSENM to the following VRM Classes:</p> <ul style="list-style-type: none"> <li>VRM Class I (1,210,900 acres) <ul style="list-style-type: none"> <li>WSAs</li> <li>WSR suitable segments classified as wild (including a 0.5-mile wide corridor)</li> <li>Lands with wilderness characteristics in the primitive area</li> <li>Former State of Utah School and Institutional Trust Lands Administration parcels adjacent to WSAs in the primitive area</li> </ul> </li> </ul> |

| Row No.      | Alternative A           | Alternative B   | Alternative C   | Alternative D  | 2020 GSENM and KEPA RMPs                      | 2000 Monument Management Plan | Alternative E 2024 Proposed RMP   |
|--------------|-------------------------|---|---|--|---|-------------------------------|---|
| -            | <b>VISUAL RESOURCES</b> |   |   |  | <b>Not for analysis. For comparison only.</b> |                               | -   |
| 126. (cont.) | (see above)             | <ul style="list-style-type: none"> <li>• VRM Class II (588,200 acres)                             <ul style="list-style-type: none"> <li>○ Areas inventoried as Scenic Quality A (except for the congressionally designated utility corridor along U.S. Highway 89)</li> <li>○ Along designated scenic routes within Visual Resource Inventory foreground and middle ground distance zones</li> <li>○ OSNHT high-potential segment (Box of Paria)</li> </ul> </li> <li>• VRM Class III (319,200 acres)                             <ul style="list-style-type: none"> <li>○ Congressionally designated utility corridor along U.S. Highway 89 (Public Law 105-355)</li> <li>○ All lands not managed as VRM Class I or II</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• VRM Class II (625,000 acres)                             <ul style="list-style-type: none"> <li>○ Areas inventoried Scenic Quality A</li> <li>○ All lands with wilderness characteristics in the passage and outback areas</li> <li>○ Along designated scenic routes within Visual Resource Inventory foreground and middle ground distance zone</li> <li>○ OSNHT Management Corridor</li> </ul> </li> <li>• VRM Class III ( 115,200 acres)                             <ul style="list-style-type: none"> <li>○ Congressionally designated utility corridor along U.S. Highway 89 (Public Law 105-355)</li> <li>○ All lands not managed as VRM Class I or II</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• VRM Class II (421,700 acres)                             <ul style="list-style-type: none"> <li>○ All other lands not managed as VRM Class I</li> </ul> </li> </ul> | (see above)                                   | (see above)                   | <ul style="list-style-type: none"> <li>• VRM Class II (547,500 acres)                             <ul style="list-style-type: none"> <li>○ All lands within the primitive area not managed as VRM I</li> <li>○ Areas inventoried Scenic Quality A</li> <li>○ Lands with wilderness characteristics in the outback areas</li> <li>○ Along designated scenic routes within Visual Resource Inventory foreground and middle ground distance zones</li> <li>○ A 4-mile segment within the congressionally designated utility corridor along Highway 89 (Public Law 105-355) to the east and through to the west of the Cockscomb formation</li> <li>○ OSNHT management corridor, except for                                     <ul style="list-style-type: none"> <li>▪ the portions that fall within the congressionally designated utility corridor along Highway 89 (Public Law 105-355)</li> <li>▪ the portions that fall within the front country area</li> </ul> </li> <li>○ All other WSR scenic and recreation segments not managed as VRM Class I</li> <li>○ All lands within the outback area not managed as VRM Class I</li> </ul> </li> <li>• VRM Class III (107,200 acres)                             <ul style="list-style-type: none"> <li>○ Lands within the Section 368 corridor 68-116</li> <li>○ Lands within the congressionally designated utility corridor along U.S. Highway 89 (Public Law 105-355) not managed as Class II</li> <li>○ All lands within the front country and passage areas not managed as VRM Class I or II</li> </ul> </li> </ul> |

| Row No. | Alternative A  | Alternative B  | Alternative C  | Alternative D  | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP  |
|---------|--|--|--|--|--|---|--|
| -       | <b>VISUAL RESOURCES</b>  |  |  |  | <b>Not for analysis. For comparison only.</b>  |   | -  |
| 127.    | <p><b>Management Direction:</b><br/>To the extent practicable and as the opportunity arises, bring existing visual contrasts remaining from past land uses into VRM class conformance.</p>   | <p><b>Management Direction:</b><br/>Reduce existing visual contrasts from past land uses to the extent practicable, through appropriate mitigation measures.</p>   | <p><b>Management Direction:</b><br/><u>Front Country and Passage Areas:</u><br/>Same as Alternative B.</p> <p><u>Outback and Primitive Areas:</u><br/>Same as Alternative D.</p> | <p><b>Management Direction:</b><br/>Bring existing visual contrasts from past land uses/projects/activities to the extent practicable, into VRM class conformance.</p> | <p><b>Management Direction:</b><br/>To the extent practicable and as the opportunity arises, bring existing visual contrasts remaining from past land uses into VRM class conformance. (GSENM ROD 2020, KEPA ROD 2020)</p>   | <p><b>Management Direction:</b><br/>The VRM classes acknowledge existing visual contrasts. Existing facilities or visual contrasts will be brought into VRM class conformance to the extent practicable when the need or opportunity arises (that is, ROW renewals, mineral material site closures, abandoned mine rehabilitation).</p>   | <p><b>Management Direction:</b><br/><u>Front Country and Passage Areas:</u><br/>Reduce existing visual contrasts from past land uses to the extent practicable, through appropriate mitigation measures.</p> <p><u>Outback and Primitive Areas:</u><br/>Bring existing visual contrasts from past land uses/projects/activities to the extent practicable, into VRM class conformance.</p>   |
| 128.    | <p><b>Management Direction:</b><br/>Allow temporary projects, such as research projects and meteorological monitoring stations, to exceed VRM objectives, if the project terminates within 3 years of initiation. Rehabilitation will be ongoing throughout project implementation if possible or begin at the end of the 3-year period. During the temporary project, the BLM Authorized Officer may require phased mitigation to better conform with VRM objectives.</p> | <p><b>Management Direction:</b><br/>The BLM Authorized Officer may allow temporary projects, such as research projects, to exceed VRM standards in Class II and III areas if the project terminates within 2 years of initiation. Rehabilitation will begin at the end of the 2-year period. During the temporary project, the Manager may require phased mitigation to better conform with prescribed VRM objectives.</p> |  |  | <p><b>Management Direction:</b><br/>Allow temporary projects, such as research projects and meteorological monitoring stations, to exceed VRM objectives, if the project terminates within 3 years of initiation. Rehabilitation will be ongoing throughout project implementation if possible or begin at the end of the 3-year period. During the temporary project, the authorized officer may require phased mitigation to better conform with VRM objectives. (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>The Monument Manager may allow temporary projects, such as research projects, to exceed VRM standards in Class II and III areas if the project terminates within 2 years of initiation. Rehabilitation will begin at the end of the 2-year period. During the temporary project, the Manager may require phased mitigation to better conform with prescribed VRM standards.</p> | <p><b>Management Direction:</b><br/>The BLM may allow temporary projects (for example, research project data-gathering stations such as meteorological towers) to exceed VRM objectives in Class II and III areas if the project terminates within 2 years of initiation, and rehabilitation of impacts that exceed VRM objectives can be brought into conformance within 3 years of project termination. Rehabilitation would begin at the end of the 2-year period. During the temporary project, the BLM may require specific phased restoration to better conform with VRM objectives.</p> |

| Row No. | Alternative A   | Alternative B   | Alternative C  | Alternative D  | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP   |
|---------|---|---|--|--|---|--|---|
| -       | <b>NIGHT SKIES</b>  |   |  |  | Not for analysis. For comparison only.  |  | -   |
| 129.    | <b>Goal:</b><br>Manage uses to protect the quality of night sky resources.  | <b>Goal:</b><br>Protect the quality of the dark night skies.  |  |  | <b>Goal:</b><br>No similar goal.  | <b>Goal:</b><br>No similar goal.   | <b>Goal:</b><br>Protect the quality of the dark night skies.  |
| 130.    | <b>Goal:</b><br>Increase public awareness and appreciation of and engagement with night sky resources.  | <b>Goal:</b><br>No similar goal.  |  |  | <b>Goal:</b><br>Increase public awareness and appreciation of and engagement with scenic, night sky, and natural soundscape resources. (GSENM ROD 2020, KEPA ROD 2020)  | <b>Goal:</b><br>No similar goal.   | <b>Goal:</b><br>No similar goal.  |
| 131.    | <b>Objective:</b><br>Inventory and monitor night skies and natural soundscapes in partnership with local communities, universities, other agencies, and stakeholders.   | <b>Objective:</b><br>Manage outdoor lighting fixtures to protect the quality of dark night skies and other GSENM objects.                         |  |  | <b>Objective:</b><br>Inventory and monitor night skies and natural soundscapes in partnership with local communities, universities, other agencies, and stakeholders. (GSENM ROD 2020, KEPA ROD 2020)   | <b>Objective:</b><br>No similar objective.   | <b>Objective:</b><br>Manage outdoor lighting fixtures to protect the quality of dark night skies.   |
| 132.    | <b>Management Direction:</b><br>Implement BMPs in coordination with stakeholders to eliminate or minimize light pollution.<br><br>Protect night sky vistas through implementation of BMPs and coordination with local communities and stakeholders. | <b>Management Direction:</b><br>Allow outdoor lighting fixtures for public health and safety only, adhering to the BMPs identified in Appendix C. | <b>Management Direction:</b><br>Allow outdoor lighting fixtures for public health and safety only, adhering to the BMPs identified in Appendix C. Where outdoor lighting fixtures are needed for public health and safety, remove, replace, or retrofit existing outdoor lighting fixtures where possible. | <b>Management Direction:</b><br>Allow outdoor lighting fixtures for public health and safety only, adhering to the BMPs identified in Appendix C. Where possible, remove, replace, or retrofit existing exterior artificial light fixtures to meet BMPs. | <b>Management Direction:</b><br>Implement BMPs in coordination with stakeholders to eliminate or minimize light pollution. (GSENM ROD 2020, KEPA ROD 2020)<br><br>Protect night sky vistas through implementation of BMPs and coordination with local communities and stakeholders. (GSENM ROD 2020, KEPA ROD 2020) | <b>Management Direction:</b><br>The BLM will seek to prevent light pollution within the Monument. No actions will be proposed within the Monument that will contribute to light pollution. The BLM will also work closely with the surrounding communities to minimize light pollution.<br><br>Strobe lights will not be allowed at any communication site. Other methods will be used to meet aircraft safety requirements. | <b>Management Direction:</b><br>Allow outdoor lighting fixtures for public health and safety only. Where outdoor lighting fixtures are needed for public health and safety, remove, replace, or retrofit existing outdoor lighting fixtures where possible. |
| 133.    | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>Seek International Dark Sky Place status.   |  |  | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>No similar management direction.   | <b>Management Direction:</b><br>Seek International Dark Sky Place status.   |

| Row No. | Alternative A   | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP  |
|---------|---|--|---------------|---------------|--|--|--|
| -       | <b>NATURAL SOUNDSCAPES</b>  |  |               |               | <b>Not for analysis. For comparison only.</b>  |  | -  |
| 134.    | <b>Goal:</b><br>Manage uses to protect the quality of natural soundscape resources.   | <b>Goal:</b><br>Protect the quality of natural soundscapes.  |               |               | <b>Goal:</b><br>Manage uses to protect the quality of night sky and natural soundscape resources. (GSENM ROD 2020, KEPA ROD 2020)                                      | <b>Goal:</b><br>No similar goal.   | <b>Goal:</b><br>Protect the quality of natural soundscapes.  |
| 135.    | <b>Goal:</b><br>Increase public awareness and appreciation of and engagement with natural soundscape resources.   | <b>Goal:</b><br>No similar goal.   |               |               | <b>Goal:</b><br>Increase public awareness and appreciation of and engagement with scenic, night sky, and natural soundscape resources. (GSENM ROD 2020, KEPA ROD 2020) | <b>Goal:</b><br>No similar goal.   | <b>Goal:</b><br>No similar goal.   |
| 136.    | <b>Objective:</b><br>Inventory and monitor night skies and natural soundscapes in partnership with local communities, universities, other agencies, and stakeholders. | <b>Objective:</b><br>Manage uses to protect the natural quiet associated with GSENM’s soundscapes. |               |               | <b>Objective:</b><br>Inventory and monitor night skies and natural soundscapes in partnership with local communities, universities, other agencies, and stakeholders.  | <b>Objective:</b><br>No similar objective.   | <b>Objective:</b><br>Manage uses to protect the natural quiet associated with GSENM’s soundscapes. |
| 137.    | <b>Management Direction:</b><br>Develop a natural soundscape management plan.   | <b>Management Direction:</b><br>No similar management direction.                                   |               |               | <b>Management Direction:</b><br>Develop a natural soundscape management plan. (GSENM ROD 2020, KEPA ROD 2020)  | <b>Management Direction:</b><br>Studies on the effects of noise utilizing both visitor surveys and sound measuring instruments will be completed to determine what the noise baseline is for various areas within the Monument. Studies will be coordinated for areas that border adjacent National Parks. | <b>Management Direction:</b><br>No similar management direction.                                   |

| Row No. | Alternative A  | Alternative B  | Alternative C  | Alternative D  | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP  |
|---------|--|--|--|--|--|--|--|
| -       | <b>NATURAL SOUNDSCAPES</b>   |  |  |  | <b>Not for analysis. For comparison only.</b>                            |  | -  |
| 138.    | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Require sound attenuation features for any facilities that generate noise to keep short-term anthropogenic noise below 75 decibels on the A-weighted scale (dBA) and long-term anthropogenic noise below 55 dBA (observed L50 sound level) at no more than 50 feet from the source.<br/>Prohibit noise-generating facilities in VSAs, lands with wilderness characteristics managed to protect those characteristics, RNAs (ACECs), and ACECs.</p> | <p><b>Management Direction:</b><br/><u>Front Country Area:</u><br/>Require sound attenuation features for any facilities that generate noise to keep short-term anthropogenic noise below 75 dBA and long-term anthropogenic noise below 55 dBA (observed L50 sound level) at no more than 50 feet from the source.<br/><br/><u>Passage and Outback Areas:</u><br/>Require sound attenuation features for any facilities that generate noise to keep noise below 10 dBA above the L90 measured background sound level at no more than 50 feet from the source.<br/><br/><u>Primitive Area:</u><br/>No noise-generating facilities.<br/><br/>At all existing facilities:<br/>Retrofit existing facilities that generate sound to reduce sound generated below area thresholds to the extent possible.</p> | <p><b>Management Direction:</b><br/>No noise-generating facilities outside developed campgrounds. Retrofit existing facilities that generate sound to reduce sound generated below 10 dBA above the L90 measured background sound level at no more than 50 feet from the source.</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/><u>Front Country Area:</u><br/>Require sound attenuation features for any facilities that generate noise to keep short-term anthropogenic noise below 75 dBA and long-term anthropogenic noise below 55 dBA (observed L50 sound level) at no more than 50 feet from the source.<br/><br/><u>Passage and Outback Areas:</u><br/>Require sound attenuation features for any facilities that generate noise to keep noise below 10 dBA above the L90 measured background sound level at no more than 50 feet from the source.<br/><br/><u>Primitive Area:</u><br/>No noise-generating facilities.<br/><br/>At all existing facilities:<br/>Retrofit existing facilities that generate sound to reduce sound generated below management area thresholds to the extent possible. Allow exceptions for scientific and research purposes as determined by the BLM Authorized Officer.</p> |
| 139.    | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Establish quiet hours to protect natural quiet at campgrounds, designated camping locations, and other locations, as warranted.</p>  |  |  | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Establish quiet hours to protect natural quiet at campgrounds, designated camping locations, and other locations, as warranted.</p>  |



| Row No. | Alternative A  | Alternative B   | Alternative C  | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP   |
|---------|--|---|--|---------------|--|--|---|
| -       | <b>FIRE MANAGEMENT</b>   |   |  |               | <b>Not for analysis. For comparison only.</b>  |  | -   |
| 140.    | <b>Goal:</b><br>Protect life, property, and resource values by responding to wildland fires based on ecological, social, and legal consequences of the fire and the circumstances under which it occurs. | <b>Goal:</b><br>Protect resource values by responding to wildland fires based on ecological importance of fire as a natural disturbance regime, while protecting life and property. |  |               | <b>Goal:</b><br>Protect life, property, and resource values by responding to wildland fires based on ecological, social, and legal consequences of the fire and the circumstances under which it occurs. (GSENM ROD 2020, KEPA ROD 2020) | <b>Goal:</b><br>Some full suppression zones occur within the Monument, found in areas where protection of structures and property are a concern. Protection of other resources is fully integrated into the fire management strategies for all of the zones in southern Utah and northern Arizona. | <b>Goal:</b><br>Protect resource values by responding to wildland fires based on ecological importance of fire as a natural disturbance regime, while protecting life and property.     |
| 141.    | <b>Goal:</b><br>No similar goal.   | <b>Goal:</b><br>Proactively maintain and restore resistant and/or resilient native ecosystems.  | <b>Goal:</b><br>Proactively maintain, restore and/or enhance resistant and/or resilient native ecosystems. |               | <b>Goal:</b><br>No similar goal.   | <b>Goal:</b><br>No similar goal  | <b>Goal:</b><br>Proactively maintain and restore resistant and/or resilient native ecosystems.  |
| 142.    | <b>Objective:</b><br>Allow natural caused wildland fire to protect, maintain, and enhance resources and, when possible, allow wildland fire to function in its natural ecological role.                  |   |  |               | <b>Objective:</b><br>Use wildland fire to protect, maintain, and enhance resources and, when possible, allow wildland fire to function in its natural ecological role. (GSENM ROD 2020, KEPA ROD 2020)                                   | <b>Objective:</b><br>The objective of the fire management program will be to allow fire to play its natural role in the ecosystem.   | <b>Objective:</b><br>Allow natural caused wildland fire to protect, maintain, and enhance resources and, when possible, allow wildland fire to function in its natural ecological role. |
| 143.    | <b>Objective:</b><br>Undertake emergency stabilization, rehabilitation, and restoration efforts to protect and sustain resources, public health and safety, and community infrastructure.                | <b>Objective:</b><br>Rehabilitate and restore landscapes after wildland fire, as appropriate for site management goals.   |  |               | <b>Objective:</b><br>Undertake emergency stabilization, rehabilitation, and restoration efforts to protect and sustain resources, public health and safety, and community infrastructure. (GSENM ROD 2020, KEPA ROD 2020)                | <b>Objective:</b><br>No similar objective.   | <b>Objective:</b><br>Rehabilitate and restore landscapes after wildland fire, as appropriate for site management goals.   |

| Row No. | Alternative A   | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan                      | Alternative E 2024 Proposed RMP  |
|---------|---|--|---------------|---------------|---|--|--|
| -       | <b>FIRE MANAGEMENT</b>  |  |               |               | <b>Not for analysis. For comparison only.</b>   |  | -  |
| 144.    | <p><b>Objective:</b><br/>Maintain the general desired wildland fire condition by having ecosystems that are at a low risk of losing ecosystem components following wildfire and that function within their historical range. In terms of fire regime condition class, the desired wildland fire condition outside wildland-urban interface is to trend to a lower fire regime condition class using the least intrusive methods possible. In other words, the desired wildland fire condition is to move lands in fire regime condition class 3 to fire regime condition class 2 and lands in fire regime condition class 2 to fire regime condition class 1 through fire and non-fire treatments where wildland fire use is the preferred method of treatment, when feasible. Inside the wildland-urban interface, the general desired wildland fire condition is to have less potential for values to be threatened by wildland fire, usually through some modification of fuels.</p> | <p><b>Objective:</b><br/>Maintain ecosystems that are at low risk of losing ecosystem components (such as ecosystems functioning within their historical range) and restore ecosystems that are at a moderate to high risk of losing ecosystem components (such as ecosystems functioning outside their historical range).</p> |               |               | <p><b>Objective:</b><br/>Maintain the general Desired Wildland Fire Condition by having ecosystems that are at a low risk of losing ecosystem components following wildfire and that function within their historical range. In terms of Fire Regime Condition Class, the Desired Wildland Fire Condition outside Wildland-Urban Interface is to trend to a lower Fire Regime Condition Class using the least intrusive methods possible. In other words, the Desired Wildland Fire Condition is to move lands from Fire Regime Condition Class 3 to Fire Regime Condition Class 2 and lands in Fire Regime Condition Class 2 to Fire Regime Condition Class 1 through fire and non-fire treatments where wildland fire use is the preferred method of treatment, when feasible. Inside the Wildland-Urban Interface, the general Desired Wildland Fire Condition is to have less potential for values to be threatened by wildland fire, usually through some modification of fuels. (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Objective:</b><br/>No similar objective.</p> | <p><b>Objective:</b><br/>Maintain ecosystems that are at low risk of losing ecosystem components (such as ecosystems functioning within their historical range) and restore ecosystems that are at a moderate to high risk of losing ecosystem components (such as ecosystems functioning outside their historical range).</p> |

| Row No. | Alternative A  | Alternative B   | Alternative C | Alternative D   | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan                                    | Alternative E 2024 Proposed RMP   |
|---------|--|---|---------------|---|--|--|---|
| -       | <b>FIRE MANAGEMENT</b>   |   |               |   | <b>Not for analysis. For comparison only.</b>                    |  | -   |
| 145.    | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Where possible, prioritize wildland fire to protect, maintain, and enhance resources and to function in its natural ecological role. The decision to let fires burn can occur if (1) the fire is naturally caused; (2) the fire management plan identifies the area as one in which fire might be used as a tool and such use is concurred to by an agency administrator, or the fire escapes initial attack; and (3) the Wildland Fire Decision Support System results in such a decision. |               |   | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>If a wildland fire is naturally caused, consider allowing it to burn if the fire management plan identifies the area as one in which fire might be used as a tool and such use is concurred to by an agency administrator, or the fire escapes initial attack and the Wildland Fire Decision Support System results in such a decision.                           |
| 146.    | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Implement landscape-scale ecosystem restoration projects to restore functional vegetative communities.  |               | <b>Management Direction:</b><br>Implement landscape-scale ecosystem restoration projects to restore native functional vegetative communities, with a prioritization of natural processes and techniques over other methods. | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Implement landscape-scale ecosystem restoration projects to restore functional vegetative communities.  |
| 147.    | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Use wildland fire across GSENM, except where fire suppression would: <ul style="list-style-type: none"> <li>• Protect life and property</li> <li>• Prevent uncharacteristic wildland fire in native habitats</li> <li>• Protect special status species habitat from uncharacteristic wildland fire</li> <li>• Benefit the protection of GSENM objects.</li> </ul>   |               |   | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Use wildland fire across GSENM, except where fire suppression would: <ul style="list-style-type: none"> <li>• Protect life and property</li> <li>• Prevent uncharacteristic wildland fire in native habitats</li> <li>• Protect special status species habitat from uncharacteristic wildland fire</li> <li>• Benefit the protection of GSENM objects.</li> </ul> |
| 148.    | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Stabilize, rehabilitate, and restore landscape characteristics after wildland fires to restore native ecosystems, as appropriate for site management goals.   |               | <b>Management Direction:</b><br>Stabilize, rehabilitate, and restore landscape characteristics after wildland fires to enhance and restore native ecosystems, prioritizing natural processes over other methods.            | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Stabilize, rehabilitate, and restore landscape characteristics after wildland fires to restore native ecosystems, as appropriate for site management goals.   |

| Row No. | Alternative A   | Alternative B  | Alternative C   | Alternative D  | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan                | Alternative E 2024 Proposed RMP  |
|---------|---|--|---|--|---|--|--|
| -       | <b>LANDS WITH WILDERNESS CHARACTERISTICS</b>  |  |   |  | <b>Not for analysis. For comparison only.</b>   |  | -  |
| 149.    | <b>Goal:</b><br>Protect, preserve, and maintain the appearance of naturalness and outstanding opportunities for solitude and/or primitive and unconfined recreation, as well as supplemental values (such as ecological, geological, or other features of scientific, educational, scenic, or historical value) within lands with wilderness characteristics, as appropriate.                             |  |   |  | <b>Goal:</b><br>Protect, preserve, and maintain the appearance of naturalness and outstanding opportunities for solitude and/or primitive and unconfined recreation within lands with wilderness characteristics, as appropriate. (GSENM ROD 2020, KEPA ROD 2020)   | <b>Goal:</b><br>No similar goal.             | <b>Goal:</b><br>Protect, preserve, and maintain the appearance of naturalness and outstanding opportunities for solitude and/or primitive and unconfined recreation, as well as supplemental values (such as ecological, geological, or other features of scientific, educational, scenic, or historical value) within lands with wilderness characteristics, as appropriate.  |
| 150.    | <b>Objective:</b><br>No similar objective.  | <b>Objective:</b><br>Determine appropriate management and land use allocations for lands with wilderness characteristics.  |   |  | <b>Objective:</b><br>No similar objective.  | <b>Objective:</b><br>No similar objective.   | <b>Objective:</b><br>Manage lands with wilderness characteristics according to land use allocations for lands with wilderness characteristics.   |
| 151.    | <b>Allocation:</b> <ul style="list-style-type: none"> <li>• Manage 0 acres to protect lands with wilderness characteristics while providing for compatible uses.</li> <li>• Manage 0 acres to minimize impacts on wilderness characteristics while emphasizing other uses.</li> <li>• Manage 559,600 acres to allow for other uses while not protecting lands with wilderness characteristics.</li> </ul> | <b>Allocation:</b> <ul style="list-style-type: none"> <li>• Manage 72,000 acres to <u>protect</u> lands with wilderness characteristics while providing for compatible uses.                             <ul style="list-style-type: none"> <li>○ Lands with wilderness characteristics that are wholly surrounded by <b>VSAs</b>.</li> </ul> </li> <li>• Manage 0 acres to <u>minimize</u> impacts on wilderness characteristics while allowing compatible uses that are consistent with the protection of GSENM objects.</li> <li>• Manage 487,600 acres for other compatible uses while <u>not protecting</u> wilderness characteristics.                             <ul style="list-style-type: none"> <li>○ Lands with wilderness characteristics that are not wholly within <b>VSAs</b>.</li> </ul> </li> </ul> | <b>Allocation:</b> <ul style="list-style-type: none"> <li>• Manage <b>240,600</b> acres to <u>protect</u> lands with wilderness characteristics while providing for compatible uses.                             <ul style="list-style-type: none"> <li>○ Lands with wilderness characteristics in the primitive area</li> </ul> </li> <li>• Manage <b>312,800</b> acres to <u>minimize</u> impacts on wilderness characteristics while allowing compatible uses that are consistent with the protection of GSENM objects.                             <ul style="list-style-type: none"> <li>○ Lands with wilderness characteristics in the passage and outback areas</li> </ul> </li> <li>• Manage <b>6,100</b> acres for other compatible uses while <u>not protecting</u> wilderness characteristics.                             <ul style="list-style-type: none"> <li>○ Lands with wilderness characteristics in the front country area</li> </ul> </li> </ul> | <b>Allocation:</b> <ul style="list-style-type: none"> <li>• Manage 559,600 acres to <u>protect</u> lands with wilderness characteristics while providing for compatible uses.</li> <li>• Manage 0 acres to <u>minimize</u> impacts on wilderness characteristics while allowing compatible uses that are consistent with the protection of GSENM objects.</li> <li>• Manage 0 acres for other compatible uses while <u>not protecting</u> wilderness characteristics.</li> </ul> | <b>Allocation:</b> <ul style="list-style-type: none"> <li>• Manage 0 acres to protect lands with wilderness characteristics while providing for compatible uses.</li> <li>• Manage 0 acres to minimize impacts on wilderness characteristics while emphasizing other multiple uses.</li> <li>• Manage 559,600 acres to allow for other multiple uses while not protecting lands with wilderness characteristics.</li> </ul> | <b>Allocation:</b><br>No similar allocation. | <b>Allocation:</b> <ul style="list-style-type: none"> <li>• Manage the 329,400 acres of lands with wilderness characteristics in the primitive area to <u>protect</u> wilderness characteristics.</li> <li>• Manage the 224,100 acres of lands with wilderness characteristics in the passage and outback areas to <u>minimize</u> impacts on wilderness characteristics.</li> <li>• Manage the 6,100 acres of lands with wilderness characteristics in the front country area for other discretionary uses while <u>not protecting</u> wilderness characteristics.</li> </ul> |

| Row No. | Alternative A   | Alternative B   | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP  |
|---------|---|---|---------------|---------------|--|--|--|
| -       | <b>LANDS WITH WILDERNESS CHARACTERISTICS</b>  |   |               |               | <b>Not for analysis. For comparison only.</b>  |  | -  |
| 152.    | <p><b>Management Direction:</b><br/>Do not apply any provisions specifically to protect wilderness characteristics. Manage lands with wilderness characteristics for uses, subject to management actions for other resources and resource uses within this plan. Where identified lands with wilderness characteristics are managed for other uses within GSENM, any activity would still ensure the proper care and management of GSENM objects.</p> | <p><b>Management Direction:</b><br/>Manage lands with wilderness characteristics managed to <u>protect</u> those characteristics while providing for compatible uses as follows:</p> <ul style="list-style-type: none"> <li>• VRM Class I</li> <li>• Closed to OHV travel</li> <li>• ROW exclusion</li> <li>• Allow vegetation management and restorations that enhance or preserve wilderness characteristics</li> <li>• Restrict construction of new structures and facilities unrelated to the preservation or enhancement of wilderness characteristics or necessary for the management of existing uses</li> </ul> |               |               | <p><b>Management Direction:</b><br/>Do not apply any provisions specifically to protect wilderness characteristics. Manage lands with wilderness characteristics for multiple uses, subject to management actions for other resources and resource uses within this plan. Where identified lands with wilderness characteristics are managed for other multiple uses within GSENM, any activity would still ensure the proper care and management of the monument objects. (GSENM ROD 2020)</p> <p>Do not apply any provisions specifically to protect wilderness characteristics. Manage lands with wilderness characteristics for multiple uses, subject to management actions for other resources and resource uses within this plan. (KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Within lands with wilderness characteristics managed to <u>protect</u> those characteristics, only allow for discretionary uses that do not impact the unit’s wilderness characteristics and that are consistent with the protection of GSENM objects.</p> <p>Management would include:</p> <ul style="list-style-type: none"> <li>• VRM Class I</li> <li>• Closed to OHV travel</li> <li>• ROW exclusion</li> <li>• Allow vegetation management and restorations that enhance or preserve wilderness characteristics</li> <li>• Restrict construction of new structures and facilities unrelated to the preservation or enhancement of wilderness characteristics or necessary for the management of existing uses</li> </ul> |

| Row No. | Alternative A  | Alternative B  | Alternative C   | Alternative D  | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP   |
|---------|--|--|---|--|--|--|---|
| -       | <b>LANDS WITH WILDERNESS CHARACTERISTICS</b>   |  |   |  | <b>Not for analysis. For comparison only.</b>  |  | -   |
| 153.    | <p><b>Management Direction:</b><br/>Manage the lands with wilderness characteristics for multiple uses to the extent that doing so is consistent with the protection of GSENM objects.</p> | <p><b>Management Direction:</b><br/>No similar management direction. (No lands with wilderness characteristics would be managed to <u>minimize</u> impacts on wilderness characteristics while allowing compatible uses that do not adversely impact GSENM objects.)</p> | <p><b>Management Direction:</b><br/>Manage lands with wilderness characteristics managed to <u>minimize</u> impacts on wilderness characteristics while allowing compatible uses that do not adversely impact GSENM objects and resources as follows:</p> <ul style="list-style-type: none"> <li>• Allow developments only if it will not diminish the total acres required to maintain lands with wilderness characteristics.</li> </ul> | <p><b>Management Direction:</b><br/>No similar management direction (all lands with wilderness characteristics would be managed for their protection).</p> | <p><b>Management Direction:</b><br/>Do not apply any provisions specifically to protect wilderness characteristics. Manage lands with wilderness characteristics for multiple uses, subject to management actions for other resources and resource uses within this plan. Where identified lands with wilderness characteristics are managed for other multiple uses within GSENM, any activity would still ensure the proper care and management of the monument objects. (GSENM ROD 2020)</p> <p>Do not apply any provisions specifically to protect wilderness characteristics. Manage lands with wilderness characteristics for multiple uses, subject to management actions for other resources and resource uses within this plan. (KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Within lands with wilderness characteristics that are managed to <u>minimize</u> impacts on wilderness characteristics, management would include:</p> <ul style="list-style-type: none"> <li>• Allow discretionary uses only if such uses (1) minimize impacts on wilderness characteristics, and (2) do not result in the elimination of the lands with wilderness characteristics unit (that is, the elimination of a 5,000-acre area that possesses naturalness and outstanding opportunities for solitude and primitive and unconfined recreation) or the manageability of the unit.</li> <li>• Seek to avoid impacts from discretionary uses on these units of wilderness characteristics; where those impacts cannot be avoided, adopt design features and other conditions to minimize such impacts. The BLM Authorized Officer should consider compensatory mitigation for those impacts that cannot be avoided and minimized.</li> </ul> |

| Row No. | Alternative A   | Alternative B  | Alternative C | Alternative D  | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP   |
|---------|---|--|---------------|--|--|--|---|
| -       | <b>LANDS WITH WILDERNESS CHARACTERISTICS</b>  |  |               |  | <b>Not for analysis. For comparison only.</b>  |  | -   |
| 154.    | <p><b>Management Direction:</b><br/>Do not apply any provisions specifically to protect wilderness characteristics. Manage lands with wilderness characteristics for multiple uses, subject to management actions for other resources and resource uses within this plan. Where identified lands with wilderness characteristics are managed for other multiple uses within GSENM, any activity would still ensure the proper care and management of GSENM objects.</p> | <p><b>Management Direction:</b><br/>Manage lands with wilderness characteristics that are managed for other compatible uses while <u>not protecting</u> wilderness characteristics according to other prescriptions in this alternative.</p> |               | <p><b>Management Direction:</b><br/>No similar management direction (all lands with wilderness characteristics would be managed for their protection).</p> | <p><b>Management Direction:</b><br/>Do not apply any provisions specifically to protect wilderness characteristics. Manage lands with wilderness characteristics for multiple uses, subject to management actions for other resources and resource uses within this plan. Where identified lands with wilderness characteristics are managed for other multiple uses within GSENM, any activity would still ensure the proper care and management of the monument objects. (GSENM ROD 2020)</p> <p>Do not apply any provisions specifically to protect wilderness characteristics. Manage lands with wilderness characteristics for multiple uses, subject to management actions for other resources and resource uses within this plan. (KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Manage lands with wilderness characteristics that are managed for other discretionary uses while <u>not protecting</u> wilderness characteristics according to other prescriptions.</p> |

| Row No. | Alternative A   | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan                                    | Alternative E 2024 Proposed RMP  |
|---------|---|--|---------------|---------------|---|--|--|
| -       | <b>WILD HORSES AND BURROS</b>   |  |               |               | <b>Not for analysis. For comparison only.</b>   |  | -  |
| 155.    | <b>Goal:</b><br>Manage wild horses in accordance with the Wild Free-Roaming Horse and Burro Act of 1971, as amended.                      |  |               |               | <b>Goal:</b><br>Manage wild horses in accordance with the Wild Free-Roaming Horse and Burro Act of 1971. (GSENM ROD 2020, KEPA ROD 2020)                  | <b>Goal:</b><br>No similar goal.                                 | <b>Goal:</b><br>Manage wild horses and burros in accordance with the Wild Free-Roaming Horse and Burro Act of 1971, as amended.            |
| 156.    | <b>Objective:</b><br>The Harvey's Fear and Moody-Wagon Box Mesa Herd Areas will not be managed for the continued presence of wild horses. |  |               |               | <b>Objective:</b><br>The Harvey's Fear and Moody-Wagon Box Mesa Herd Areas will not be managed for the continued presence of wild horses. (KEPA ROD 2020) | <b>Objective:</b><br>No similar objective.                       | <b>Objective:</b><br>The Harvey's Fear and Moody-Wagon Box Mesa Herd Areas would not be managed for the continued presence of wild horses. |
| 157.    | <b>Management Direction:</b><br>Remove wild horses from the Harvey's Fear and Moody-Wagon Box Mesa Herd Areas.                            |  |               |               | <b>Management Direction:</b><br>Remove wild horses from the Harvey's Fear and Moody-Wagon Box Mesa Herd Areas. (GSENM ROD 2020, KEPA ROD 2020)            | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Remove wild horses from the Harvey's Fear and Moody-Wagon Box Mesa Herd Areas.                             |
| 158.    | <b>Management Direction:</b><br>Remove wild horses from public lands that are outside the herd areas.                                     |  |               |               | <b>Management Direction:</b><br>Remove wild horses from public lands that are outside the herd areas. (GSENM ROD 2020, KEPA ROD 2020)                     | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Remove wild horses and burros from public lands that are outside the herd areas.                           |
| 159.    | <b>Management Direction:</b><br>Conduct population surveys of wild horses within herd areas every 3 to 4 years.                           | <b>Management Direction:</b><br>No similar management direction. |               |               | <b>Management Direction:</b><br>Conduct population surveys of wild horses within herd areas every 3 to 4 years. (GSENM ROD 2020, KEPA ROD 2020)           | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>No similar management direction.   |



| Row No. | Alternative A  | Alternative B  | Alternative C | Alternative D  | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan                      | Alternative E 2024 Proposed RMP   |
|---------|--|--|---------------|--|--|--|---|
| -       | <b>FORESTRY AND WOODLAND PRODUCTS</b>  |  |               |  | <b>Not for analysis. For comparison only.</b>  |  | -   |
| 160.    | <p><b>Goal:</b><br/>Promote, sustain, and improve forest health.</p>   | <p><b>Goal:</b><br/>Ensure <b>resiliency</b>, health, and sustainable management of the forest and woodland ecosystems within GSENM, while preserving their biological diversity and productivity.</p> |               |  | <p><b>Goal:</b><br/>Promote, sustain, and improve forest health. (GSENM ROD 2020, KEPA ROD 2020)</p>   | <p><b>Goal:</b><br/>No similar goal.</p>           | <p><b>Goal:</b><br/>Ensure <b>resiliency</b>, health, and sustainable management of the forest and woodland ecosystems, and preservation of the biological diversity and productivity, within all areas identified for provision of forestry and woodland products.</p> |
| 161.    | <p><b>Objective:</b><br/>Improve forest and woodland health to protect watershed values and support wildlife habitat requirements.</p> <p>Maintain healthy forest/woodlands and populations of other plants.</p> <p>Manage areas with ponderosa pine and aspen to maintain and improve the stand health.</p> | <p><b>Objective:</b><br/>Maintain and restore forest and woodland health to protect watershed values, support wildlife habitat requirements, and reduce potential for catastrophic wildfires.</p>      |               | <p><b>Objective:</b><br/>Maintain, enhance, and/or restore forest and woodland health to protect watershed values, support wildlife habitat requirements, and reduce potential for catastrophic wildfires.</p> | <p><b>Objective:</b><br/>Improve forest and woodland health to protect watershed values and support wildlife habitat requirements. (GSENM ROD 2020, KEPA ROD 2020)</p> <p>Maintain healthy forest/woodlands and populations of other plants. (GSENM ROD 2020, KEPA ROD 2020)</p> <p>Manage areas with ponderosa pine and aspen to maintain and improve the stand health. (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Objective:</b><br/>No similar objective.</p> | <p><b>Objective:</b><br/>Manage forest and woodland health in a manner that maintains and restores forest and woodland health, including watershed values, healthy soils, and maintenance of plant and wildlife habitats.</p>   |

| Row No. | Alternative A   | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP  |
|---------|---|--|---------------|---------------|--|--|--|
| -       | <b>FORESTRY AND WOODLAND PRODUCTS</b>   |  |               |               | <b>Not for analysis. For comparison only.</b>  |  | -  |
| 162.    | <p><b>Management Direction:</b><br/>Allow commercial fuelwood harvesting, post cutting, and Christmas tree cutting except in WSAs, and areas posted or signed as closed in order to meet forestry goals and objectives otherwise designated or subject to a stipulation.</p> <p>Prohibit the removal of ponderosa pine for Christmas trees.</p> <p>Allow commercial timber harvesting for the purposes of promoting or sustaining forest health across the entirety of GSENM.</p> | <p><b>Management Direction:</b><br/>Prohibit the commercial harvest of forestry and woodland products.</p> |               |               | <p><b>Management Direction:</b><br/>Allow commercial fuelwood harvesting, post cutting, and Christmas tree cutting except in WSAs, and areas posted or signed as closed in order to meet forestry goals and objectives otherwise designated or subject to a stipulation. (GSENM ROD 2020, KEPA ROD 2020)</p> <p>Prohibit the removal of ponderosa pine for Christmas trees. (GSENM ROD 2020, KEPA ROD 2020)</p> <p>Allow commercial timber harvesting for the purposes of promoting or sustaining forest health across the entirety of the monument units. (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>No commercial timber harvesting is authorized within the Monument.</p> | <p><b>Management Direction:</b><br/>Prohibit the commercial harvest of forestry and woodland products.</p> |

| Row No. | Alternative A   | Alternative B   | Alternative C   | Alternative D  | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP   |
|---------|---|---|---|--|--|--|---|
| -       | <b>FORESTRY AND WOODLAND PRODUCTS</b>   |   |   |  | <b>Not for analysis. For comparison only.</b>  |  | -   |
| 163.    | <p><b>Management Direction:</b><br/>Allow noncommercial fuelwood harvesting, post cutting, and Christmas tree cutting except in WSAs, and areas posted or signed as closed in order to meet forestry goals and objectives otherwise designated or subject to a stipulation.</p> <p>Prohibit the removal of ponderosa pine for Christmas trees.</p> <p>Allow noncommercial timber harvesting for the purposes of promoting or sustaining forest health across the entirety of GSENM.</p> | <p><b>Management Direction:</b><br/>Allow for the noncommercial harvest of forestry and woodland products, if it maintains watershed values, supports wildlife habitat requirements, and reduces potential for catastrophic wildfires.</p> <p>Prohibit noncommercial harvest of forestry and woodland products in the following areas:</p> <ul style="list-style-type: none"> <li>• WSAs</li> <li>• Lands with wilderness characteristics managed for protection</li> <li>• Ponderosa pine, Douglas-fir, mixed conifer, and aspen stands</li> <li>• Areas undergoing restoration</li> <li>• 330 feet from riparian areas</li> </ul> | <p><b>Management Direction:</b><br/>Allow for the noncommercial harvest of forestry and woodland products in the designated wood harvesting areas. Additional areas may be designated, if it maintains watershed values, supports wildlife habitat requirements, and reduces potential for catastrophic wildfires.</p> <p>Prohibit noncommercial harvest of forestry and woodland products in the following areas:</p> <ul style="list-style-type: none"> <li>• WSAs</li> <li>• Lands with wilderness characteristics managed for protection</li> <li>• Ponderosa pine, Douglas-fir, mixed conifer, and aspen stands</li> <li>• Areas undergoing restoration</li> <li>• 330 feet from riparian areas</li> </ul> | <p><b>Management Direction:</b><br/>Prohibit noncommercial harvest of forestry and woodland products unless it furthers the protection of GSENM objects.</p> | <p><b>Management Direction:</b><br/>Allow noncommercial fuelwood harvesting, post cutting, and Christmas tree cutting except in WSAs, and areas posted or signed as closed in order to meet forestry goals and objectives otherwise designated or subject to a stipulation. (GSENM ROD 2020, KEPA ROD 2020)</p> <p>Prohibit the removal of ponderosa pine for Christmas trees. (GSENM ROD 2020, KEPA ROD 2020)</p> <p>Allow noncommercial timber harvesting for the purposes of promoting or sustaining forest health across the entirety of the monument units. (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>There are currently two forestry product areas located in the Monument: Rock Springs Bench area and Buckskin Mountain area.</p> <p>Additional areas may be designated to meet the overall vegetation management objectives but will not be allowed outside already disturbed areas. All cutting areas will be designated under a permit system, with maps provided to assure compliance. (MMP 2000)</p> <p>Allow by permitting fuelwood harvesting, post cutting, and Christmas tree cutting only within designated areas (MMP 2000).</p> <p>As stated in the Proposed Plan, access off of designated routes will generally be allowed within 50 feet of the designated route, in designated fuelwood cutting areas. However, because fuelwood cutting is controlled by a permit and permits are issued to further overall management objectives, the BLM could authorize access on administrative routes and, in some cases, in areas more than 50 feet away from designated routes. These areas/provisions would be delineated in the permit prior to its issuance (MMP 2000).</p> | <p><b>Management Direction:</b><br/>Consider the noncommercial harvest of forestry and woodland products on a site-specific basis, consistent with the protection of GSENM objects and in accordance with applicable law.</p> <p>Determine areas and species available for collection as climatic conditions allow, and ensure maintenance and health of the applicable ecosystems.</p> <p>Prohibit harvest of forestry and woodland products in the following areas:</p> <ul style="list-style-type: none"> <li>• WSAs</li> <li>• Lands with wilderness characteristics managed for protection of the wilderness characteristics</li> <li>• Ponderosa pine, Douglas-fir, mixed conifer, and aspen stands</li> <li>• Restoration areas</li> <li>• 330 feet from riparian areas</li> </ul> |

| Row No. | Alternative A  | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP                                  |
|---------|--|--|---------------|---------------|--|--|--|
| -       | <b>FORESTRY AND WOODLAND PRODUCTS</b>  |  |               |               | <b>Not for analysis. For comparison only.</b>  |  | -  |
| 164.    | <b>Management Direction:</b><br>Permit harvesting of woodland products in riparian areas for the maintenance and/or improvement of riparian ecosystems.  | <b>Management Direction:</b><br>No similar management direction.   |               |               | <b>Management Direction:</b><br>Permit harvesting of woodland products in riparian areas for the maintenance and/or improvement of riparian ecosystems. (GSENM ROD 2020, KEPA ROD 2020)  | <b>Management Direction:</b><br>No similar management direction.                 | <b>Management Direction:</b><br>No similar management direction. |
| -       | <b>VEGETATION—PLANT AND SEED COLLECTION</b>  |  |               |               | -  | -  | -  |
| 165.    | <b>Management Direction:</b><br>Allow commercial seed collection, except in WSAs. Areas and species available for commercial collection would be determined as climatic conditions allow, in accordance with BLM guidance and policy.  | <b>Management Direction:</b><br>Allow commercial and noncommercial seed collection to support restoration efforts. Areas and species available for collection will be determined as climatic conditions allow as well as ensuring maintenance and health of the seed source. |               |               | <b>Management Direction:</b><br>Allow commercial seed collection, except in WSAs. Areas and species available for commercial collection would be determined as climatic conditions allow, in accordance with BLM guidance and policy. (GSENM ROD 2020, KEPA ROD 2020)  | <b>Management Direction:</b><br>Preclude commercial seed collection.             | <b>Management Direction:</b><br>No similar management direction. |
| 166.    | <b>Management Direction:</b><br>Allow commercial and noncommercial use of vegetation materials (excluding seed collection, fuelwood collection, and pine nut harvest) and collection in specified areas identified by permit as climatic conditions allow and in accordance with applicable policies, guidance, and regulations.<br><br>Commercial collection and forest product removal in WSAs would not be allowed. | <b>Management Direction:</b><br>No similar management direction.   |               |               | <b>Management Direction:</b><br>Allow commercial and noncommercial use of vegetation materials (excluding seed collection, fuelwood collection, and pine nut harvest) and collection in specified areas identified by permit as climatic conditions allow and in accordance with applicable policies, guidance, and regulations.<br><br>Commercial collection and forest product removal in WSAs would not be allowed. (GSENM ROD 2020, KEPA ROD 2020) | <b>Management Direction:</b><br>Preclude commercial use of vegetative materials. | <b>Management Direction:</b><br>No similar management direction. |

| Row No. | Alternative A  | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP  |
|---------|--|--|---------------|---------------|--|--|--|
| -       | <b>LIVESTOCK GRAZING</b>   |  |               |               | <b>Not for analysis. For comparison only.</b>  |  | -  |
| 167.    | <b>Goal:</b><br>Maintain, restore, or enhance rangeland health and provide for appropriate livestock grazing opportunities.  | <b>Goal:</b><br>Protect and restore healthy native rangelands.   |               |               | <b>Goal:</b><br>Maintain, restore, or enhance rangeland health and provide for appropriate livestock grazing opportunities. (GSENM ROD 2020, KEPA ROD 2020)  | <b>Goal:</b><br>No similar goal.   | <b>Goal:</b><br>Protect and restore healthy native rangelands.   |
| 168.    | <b>Objective:</b><br>Maintain, restore, or enhance sustainable rangeland ecosystems to meet the BLM Utah Rangeland Health Standards and to produce a wide range of public values such as wildlife habitat, livestock forage, recreation opportunities, clean water, sustainable economic benefits to local communities, and functional watersheds. | <b>Objective:</b><br>Implement livestock grazing management practices to meet the BLM Utah Rangeland Health Standards in a manner that is consistent with the protection of GSENM objects. |               |               | <b>Objective:</b><br>Maintain, restore, or enhance sustainable rangeland ecosystems to meet BLM Utah's Standards for Rangeland Health and to produce a wide range of public values such as wildlife habitat, livestock forage, recreation opportunities, clean water, sustainable economic benefits to local communities, and functional watersheds. (GSENM ROD 2020, KEPA ROD 2020) | <b>Objective:</b><br>The [Grazing Management] process will be followed so that grazing management conforms with the grazing regulations and Utah's Standards and Guidelines. In this process, each grazing allotment will be assessed, and new allotment management plans will be developed, consistent with the BLM-wide grazing permit renewal process.  | <b>Objective:</b><br>Implement livestock grazing management practices to meet the BLM Utah Rangeland Health Standards in a manner that is consistent with the protection of GSENM objects. |
| 169.    | <b>Objective:</b><br>Integrate livestock use and associated management practices with other needs and objectives to maintain, protect, and improve rangeland health while reducing conflicts.  | <b>Objective:</b><br>Minimize conflicts between livestock grazing and other discretionary uses.  |               |               | <b>Objective:</b><br>Integrate livestock use and associated management practices with other multiple-use needs and objectives to maintain, protect, and improve rangeland health while reducing conflicts. (GSENM ROD 2020, KEPA ROD 2020)   | <b>Objective:</b><br>In developing allocation plans for areas, efforts will be made to coordinate with other resource planning efforts (such as research, grazing allotment management plans), as discussed in the implementation and adaptive management framework [evaluation, planning, implementation, monitoring]. This type of integrated activity planning will lead to more comprehensive planning efforts for specific areas and to better decision-making. | <b>Objective:</b><br>Minimize conflicts between livestock grazing and other discretionary uses.  |
| 170.    | <b>Objective:</b><br>Reduce or eliminate livestock-related rangeland resource problems on all allotments not meeting rangeland health standards while maintaining livestock forage in the long term.   | <b>Objective:</b><br>No similar objective.   |               |               | <b>Objective:</b><br>Reduce or eliminate livestock-related rangeland resource problems on all allotments not meeting rangeland health standards while maintaining livestock forage in the long term. (GSENM ROD 2020, KEPA ROD 2020)   | <b>Objective:</b><br>No similar objective.   | <b>Objective:</b><br>No similar objective.   |

| Row No. | Alternative A  | Alternative B   | Alternative C                                | Alternative D  | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP   |
|---------|--|---|--|--|---|---|---|
| -       | <b>LIVESTOCK GRAZING</b>   |   |  |  | Not for analysis. For comparison only.  |   | -   |
| 171.    | <b>Objective:</b><br>Design grazing systems and range improvements to achieve and maintain healthy rangelands.   | <b>Objective:</b><br>No similar objective.  |  |  | <b>Objective:</b><br>Design grazing systems and range improvements to achieve and maintain healthy rangelands. (GSENM ROD 2020, KEPA ROD 2020)  | <b>Objective:</b><br>No similar objective.  | <b>Objective:</b><br>No similar objective.  |
| -       | <b>LIVESTOCK GRAZING – ALLOCATIONS</b>   |   |  |  | -   | -   | -   |
| 172.    | <b>Management Direction:</b><br>The existing holder voluntarily relinquished the grazing permit for the Big Bowns Bench Allotment; as such, the lands are retired from livestock grazing consistent with Proclamation 10286 of October 8, 2021 (86 Federal Register 57335; October 15, 2021).  | <b>Management Direction:</b><br>The existing holder voluntarily relinquished the grazing permit for the Big Bowns Bench Allotment; as such, the lands are retired from livestock grazing. The forage in the former allotment is not allocated for livestock consistent with Proclamation 10286 of October 8, 2021 (86 Federal Register 57335; October 15, 2021).  |  |  | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>No similar management direction.  |
| 173.    | <b>Allocation:</b><br>Allocate the following allotments or areas as unavailable for livestock grazing and maintain closures or cancel grazing permits, including the following areas:<br><ul style="list-style-type: none"> <li>• Big Bowns Bench</li> <li>• Deer Creek Allotment, River Pasture</li> <li>• Dry Hollow</li> <li>• Escalante River Allotment</li> <li>• Harvey’s Fear Allotment</li> <li>• Flag Point</li> <li>• Muley Twist</li> <li>• Navajo Bench</li> <li>• No Mans Mesa</li> <li>• Phipps Allotment, Upper River Pasture</li> <li>• Phipps Allotment, Lower River Pasture</li> <li>• Rattlesnake Bench Allotment</li> <li>• Rock Creek-Mudholes Allotment, Dry Rock Creek</li> </ul> | <b>Allocation:</b><br>Allocate the following allotments or areas as unavailable for livestock grazing and maintain closures or cancel grazing permit:<br><ul style="list-style-type: none"> <li>• All allotments and pastures closed in Alternative A</li> <li>• Antone Flat</li> <li>• Deer Creek Allotment, Cottonwood pasture</li> <li>• Deer Creek Allotment, Wolverine Bench Pasture</li> <li>• Little Bown’s Bench</li> <li>• Longneck</li> <li>• Long Canyon Stock Driveway</li> <li>• McGath Point</li> <li>• Phipps Allotment, Phipps Pasture</li> <li>• Saltwater Creek</li> <li>• Steep Creek</li> <li>• Upper Paria, South Pasture</li> </ul> | <b>Allocation:</b><br>Same as Alternative B. | <b>Allocation:</b><br>Allocate the following allotments or areas as unavailable for livestock grazing, cancel any existing term grazing permits, and prohibit new term grazing permits:<br><ul style="list-style-type: none"> <li>• All allotments and pastures included in Alternative B with the following additions:</li> <li>• Black Rock</li> <li>• Black Rock (State)</li> <li>• Boot</li> <li>• Boulder Creek</li> <li>• Calf Pasture</li> <li>• Circle Cliffs</li> <li>• Clark Bench</li> <li>• Cottonwood</li> <li>• Death Hollow</li> <li>• Deer Creek</li> <li>• Deer Spring Point</li> <li>• Dry Valley</li> </ul> | <b>Allocation:</b><br>Allocate 108,726 acres unavailable for livestock grazing and maintain closures or cancel grazing permits, including the following areas:<br><ul style="list-style-type: none"> <li>• Deer Creek Allotment, River pasture</li> <li>• Escalante River Allotment</li> <li>• Harvey’s Fear Allotment</li> <li>• Muley Twist</li> <li>• Navajo Bench</li> <li>• No Mans Mesa</li> <li>• Phipps Allotment, Upper River pasture</li> <li>• Phipps Allotment, Lower River pasture</li> <li>• Rattlesnake Bench Allotment</li> <li>• Rock Creek-Mudholes Allotment, Dry Rock Creek pasture</li> <li>• Spencer Bench</li> <li>• Willow Gulch Allotment, Lower Calf Creek Falls pasture</li> </ul> | In the 2000 MMP, livestock grazing allocations for allotments available and unavailable for livestock grazing, as well as area-wide AUMs, were deferred to a future grazing plan that would evaluate and renew permits for each allotment administered by GSENM. Such a plan did not take place. The allocations for available and unavailable in this section reflect the scenario that existed prior to approval of the 2000 RMPs.<br><br><b>Allocation:</b><br>Allocate 108,726 acres unavailable for livestock grazing and maintain closures in the following areas:<br><ul style="list-style-type: none"> <li>• Big Bowns Bench, River pasture</li> <li>• Deer Creek Allotment, Cottonwood and River pastures</li> </ul> | <b>Allocation:</b><br>Allocate the following allotments or areas as unavailable for livestock grazing and maintain closures or cancel grazing permit:<br><ul style="list-style-type: none"> <li>• Antone Flat</li> <li>• Big Bowns Bench<sup>8</sup></li> <li>• Deer Creek Allotment, River Pasture</li> <li>• Deer Creek Allotment, Cottonwood Pasture</li> <li>• Dry Hollow</li> <li>• Escalante River Allotment</li> <li>• Flag Point</li> <li>• Harvey’s Fear Allotment</li> <li>• Longneck</li> <li>• McGath Point</li> <li>• Muley Twist</li> <li>• Navajo Bench</li> <li>• No Mans Mesa</li> </ul> |

<sup>8</sup> The existing holder voluntarily relinquished the grazing permit for the Big Bowns Bench Allotment; as such, the lands are retired from livestock grazing. The forage in the former allotment is not allocated for livestock consistent with Proclamation 10286 of October 8, 2021 (86 Federal Register 57335; October 15, 2021).

| Row No.      | Alternative A  | Alternative B | Alternative C | Alternative D  | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP  |
|--------------|--|---------------|---------------|--|--|---|--|
| -            | <b>LIVESTOCK GRAZING</b>   |               |               |  | <b>Not for analysis. For comparison only.</b>  |   | -  |
| 173. (cont.) | <p>Pasture (includes Middle Rock Creek area)</p> <ul style="list-style-type: none"> <li>• Spencer Bench</li> <li>• Willow Gulch Allotment, Lower Calf Creek Falls Pasture</li> <li>• Areas currently outside any grazing allotment</li> </ul> <p>In areas that would be unavailable for livestock grazing, livestock could be used to achieve resource objectives such as fuel reductions and/or weed control.</p> | (see above)   | (see above)   | <ul style="list-style-type: none"> <li>• Five Mile Mountain</li> <li>• Flood Canyon</li> <li>• Ford Well</li> <li>• Headwaters</li> <li>• Hells Bellows</li> <li>• Johnson Canyon</li> <li>• Johnson Point</li> <li>• King Bench</li> <li>• Last Chance (winter)</li> <li>• Lower Hackberry</li> <li>• Mill Creek</li> <li>• Mollies Nipple</li> <li>• Mud Springs</li> <li>• Pine Point</li> <li>• Round Valley</li> <li>• Rush Beds</li> <li>• School Section</li> <li>• Second Point</li> <li>• Timber Mountain</li> <li>• Upper Hackberry</li> <li>• Upper Paria</li> <li>• Vermilion</li> <li>• Willow Gulch</li> </ul> | <p>In areas that would be unavailable for livestock grazing, livestock could be used to achieve resource objectives such as fuel reductions and/or weed control (GSENM ROD 2020, KEPA ROD 2020).</p> | <ul style="list-style-type: none"> <li>• Dry Hollow</li> <li>• Escalante River</li> <li>• Harvey's Fear Allotment</li> <li>• Longneck</li> <li>• McGath Point</li> <li>• Muley Twist</li> <li>• Navajo Bench</li> <li>• Phipps Allotment, Upper River pasture</li> <li>• Rattlesnake Bench Allotment</li> <li>• Rock Creek-Mudholes Allotment, Dry Rock Creek and Middle Rock Creek pastures</li> <li>• Saltwater Creek</li> <li>• Spencer Bench</li> <li>• Steep Creek</li> <li>• Willow Gulch Allotment, Lower Calf Creek Falls pasture</li> </ul> <p>Manage reserve common allotments (forage reserves) in the following areas. These forage reserves would only be used during emergencies or for research purposes. Emergencies would include, but would not be limited to, drought, insect outbreaks, fire, or floods. Any emergency use would not exceed current authorized use and could occur from October 1 to March 31:</p> <ul style="list-style-type: none"> <li>• Deer Creek Allotment, Wolverine Bench pasture (3,816 acres)</li> <li>• Little Bown's Bench (3,422 acres)</li> <li>• Phipps Allotment, Phipps Pasture (7,365 acres)</li> </ul> | <ul style="list-style-type: none"> <li>• Phipps Allotment, Lower River Pasture</li> <li>• Phipps Allotment, Upper River Pasture</li> <li>• Rattlesnake Bench Allotment</li> <li>• Rock Creek-Mudholes Allotment, Dry Rock Creek Pasture (includes Middle Rock Creek Area)</li> <li>• Saltwater Creek</li> <li>• Spencer Bench</li> <li>• Steep Creek</li> <li>• Upper Paria, South Pasture</li> <li>• Willow Gulch Allotment, Lower Calf Creek Falls Pasture</li> <li>• Long Canyon Stock Driveway</li> <li>• Circle Cliffs Allotment, Gulch Pasture</li> <li>• Cottonwood Allotment, Paria River Pasture</li> <li>• Cottonwood Allotment, Paria Box Pasture</li> <li>• Upper Paria Allotment, Upper River Pasture</li> <li>• Areas currently outside any grazing allotment</li> </ul> |

| Row No. | Alternative A   | Alternative B   | Alternative C   | Alternative D   | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP  |
|---------|---|---|---|---|--|--|--|
| -       | <b>LIVESTOCK GRAZING</b>  |   |   |   | <b>Not for analysis. For comparison only.</b>  |  | -  |
| 174.    | <b>Management Direction:</b><br>No similar management direction.                                | <b>Management Direction:</b><br>No similar management direction.                                | <b>Management Direction:</b><br>No similar management direction.                                | <b>Management Direction:</b><br>No similar management direction.                              | <b>Management Direction:</b><br>No similar management direction.   | <b>Management Direction:</b><br>No similar management direction.                   | <b>Management Direction:</b><br>Allocate the following 14,700 acres unavailable for livestock grazing and allow livestock trailing as necessary for proper management of adjacent or nearby allotments. <ul style="list-style-type: none"> <li>• Long Canyon Stock Driveway</li> <li>• Circle Cliffs Allotment, Gulch Pasture</li> <li>• Cottonwood Allotment, Paria River Pasture</li> <li>• Cottonwood Allotment, Paria Box Pasture</li> <li>• Upper Paria Allotment, Upper River Pasture</li> </ul> Livestock would be actively herded in a manner that minimizes the duration of livestock in these areas. |
| 175.    | <b>Allocation:</b><br>No similar allocation.  | <b>Allocation:</b><br>No similar allocation.  | <b>Allocation:</b><br>No similar allocation.  | <b>Allocation:</b><br>No similar allocation.  | <b>Allocation:</b><br>No similar allocation.   | <b>Allocation:</b><br>No similar allocation (see Row 173).                         | <b>Allocation:</b><br>Allocate 14,603 acres as available for livestock grazing, limited to non-renewable permits and leases: <ul style="list-style-type: none"> <li>• Deer Creek Allotment, Wolverine Bench Pasture</li> <li>• Little Bowns Bench Allotment</li> <li>• Phipps Allotment, Phipps Pasture</li> </ul>   |
| 176.    | <b>Allocation:</b><br>Allocate 2,117,300 acres <sup>9</sup> as available for livestock grazing. | <b>Allocation:</b><br>Allocate 2,042,100 acres <sup>9</sup> as available for livestock grazing. | <b>Allocation:</b><br>Allocate 2,042,100 acres <sup>9</sup> as available for livestock grazing. | <b>Allocation:</b><br>Allocate 918,300 acres <sup>9</sup> as available for livestock grazing. | <b>Allocation:</b><br>Allocate 2,136,602 acres as available for livestock grazing (GSENM ROD 2020; KEPA ROD 2020). | <b>Allocation:</b><br>Allocate 2,053,761 acres as available for livestock grazing. | <b>Allocation:</b><br>Allocate 1,737,300 acres <sup>9</sup> as available for livestock grazing.  |

<sup>9</sup> Allocations as available for livestock grazing under Alternatives A, B, C, and D include the allotments managed by the NPS in Glen Canyon that are administered by the BLM. They were included under Alternatives A, B, C, and D for analysis at the request of the NPS. The ROD for this plan will have no authority to close any allotments for the NPS; therefore, the Proposed RMP as shown in Alternative E does not include these areas. See **Section 1.3** on the distinction between the grazing planning area and decision area, and also **Section 3.15** on the NPS request for analysis of Glen Canyon allotments.



| Row No. | Alternative A   | Alternative B  | Alternative C  | Alternative D   | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP   |
|---------|---|--|--|---|--|---|---|
| -       | <b>LIVESTOCK GRAZING</b>  |  |  |   | <b>Not for analysis. For comparison only.</b>  |   | -   |
| 177.    | <p><b>Management Direction:</b><br/>Manage the previously unallotted Antone Flat, Upper Paria—South pasture, and Varney Griffin allotments as available for livestock grazing. Conduct assessments to determine available AUMs.</p>                                     | <p><b>Management Direction:</b><br/>No similar management direction.</p>   |  |   | <p><b>Management Direction:</b><br/>Manage the previously unallotted Antone Flat, Upper Paria—South pasture, and Varney Griffin allotments as available for livestock grazing. Conduct assessments to determine available AUMs. (GSENM ROD 2020; KEPA ROD 2020)</p>                                    | <p><b>Management Direction:</b><br/>Continue the unallotted status of the following areas by not allocating livestock forage in these areas:</p> <ul style="list-style-type: none"> <li>• Antone Flat</li> <li>• Upper Paria (South pasture)</li> <li>• Flag Point</li> <li>• Unallotted areas in Glen Canyon</li> <li>• Varney Griffin (continue to allow trailing; note: Varney Griffin is entirely in the Kanab Field Office [KFO])</li> <li>• No Mans Mesa</li> </ul> | <p><b>Management Direction:</b><br/>No similar management direction.</p>  |
| 178.    | <p><b>Allocation:</b><br/>Allocate 107,995 AUMs.</p> <p>When active AUMs reach 95 percent of permitted AUMs, reevaluate whether the maximum permitted AUMs may be increased. Increasing permitted AUMs would require a plan amendment and associated NEPA analysis.</p> | <p><b>Allocation:</b><br/>Allocate 105,034 AUMs (active and suspended) for livestock. Upon voluntary relinquishment of a grazing permit or lease, the number of allocated AUMs will automatically decrease by the number of AUMs authorized by that permit or lease at the time of relinquishment, unless the BLM determines that the reallocation of grazing forage associated with the relinquished permit or lease will advance the purposes of Proclamations 10286 and 6920.</p> | <p><b>Allocation:</b><br/>Allocate 105,034 AUMs (active and suspended) for livestock. Upon voluntary relinquishment of a grazing permit or lease, the number of allocated AUMs will automatically decrease by the number of AUMs authorized by that permit or lease at the time of relinquishment, unless the BLM determines that the reallocation of grazing forage associated with the relinquished permit or lease will advance the purposes of Proclamations 10286 and 6920.</p> | <p><b>Allocation:</b><br/>Allocate 43,970 AUMs (active) for livestock. Upon voluntary relinquishment of a grazing permit or lease, the number of allocated AUMs will automatically decrease by the number of AUMs authorized by that permit or lease at the time of relinquishment, unless the BLM determines that the reallocation of grazing forage associated with the relinquished permit or lease will advance the purposes of Proclamations 10286 and 6920.</p> | <p><b>Allocation:</b><br/>Allocate 107,995 AUMs.</p> <p>When active AUMs reach 95 percent of permitted AUMs reevaluate whether the maximum permitted AUMs may be increased. Increasing permitted AUMs would require a plan amendment and associated NEPA analysis. (GSENM ROD 2020; KEPA ROD 2020)</p> | <p><b>Allocation:</b><br/>Allocate 106,202 AUMs.</p>  | <p><b>Allocation:</b><br/>Allocate 104,980 AUMs (active and suspended) for livestock.</p> <p>Upon voluntary relinquishment of a grazing permit or lease, the number of allocated AUMs would automatically decrease by the number of AUMs authorized by that permit or lease at the time of relinquishment, unless the BLM determines that the reallocation of grazing forage associated with the relinquished permit or lease would advance the purposes of Proclamations 10286 and 6920.</p> |

| Row No. | Alternative A  | Alternative B   | Alternative C | Alternative D  | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP  |
|---------|--|---|---------------|--|--|--|--|
| -       | <b>LIVESTOCK GRAZING</b>   |   |               |  | <b>Not for analysis. For comparison only.</b>                            |  | -  |
| -       | <i>LIVESTOCK GRAZING – GRAZING MANAGEMENT PRACTICES</i>                  |   |               |  | -  | -  | -  |
| 179.    | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Within 2 years of the signing of the ROD, complete land health assessments and, if needed, causal factor determinations, on allotments within the following watersheds:</p> <ul style="list-style-type: none"> <li>• Upper Johnson Wash</li> <li>• Horse Canyon-Escalante River</li> <li>• Last Chance Creek</li> <li>• Upper Paria</li> <li>• Hackberry Canyon-Cottonwood Creek</li> <li>• Middle Paria</li> <li>• Upper Buckskin Gulch</li> <li>• Lower Deer Creek</li> <li>• Bear Creek-Boulder Creek</li> </ul> <p>The land health assessments and causal factor determinations will inform the BLM’s full processing of livestock grazing permit renewals for allotments within those watersheds, which will be completed within 5 years of the signing of the ROD.</p> <p>Once the assessments/determinations and fully processed permit renewals have been completed in these priority watersheds, implement a plan to conduct land health assessments and, if needed, causal factor determinations. Fully process all remaining permit renewals across GSENM, which would be completed within 10 years of the signing of the ROD.</p> <p>If a land health determination indicates that grazing use is not consistent with the provisions of 43 CFR 4180, decrease permitted use in accordance with 43 CFR 4110.3-2 and make changes to grazing practices to support the achievement of the BLM Utah Rangeland Health Standards and ensure consistency with the protection and restoration of GSENM objects.</p> |               | <p><b>Management Direction:</b><br/>Within 10 years of the signing of the ROD, complete land health assessments and, if needed, causal factor determinations, and fully process all permit renewals across GSENM. If a land health determination indicates that grazing use is not consistent with the provisions of 43 CFR 4180, decrease permitted use in accordance with 43 CFR 4110.3-2 and make changes to grazing practices to support the achievement of the BLM Utah Rangeland Health Standards and ensure consistency with the protection and restoration of GSENM objects.</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Within 2 years of the signing of the ROD, complete land health assessments and, if needed, causal factor determinations, on allotments within the following priority watersheds:</p> <ul style="list-style-type: none"> <li>• Upper Johnson Wash</li> <li>• Horse Canyon-Escalante River</li> <li>• Last Chance Creek</li> <li>• Upper Paria</li> <li>• Hackberry Canyon-Cottonwood Creek</li> <li>• Middle Paria</li> <li>• Upper Buckskin Gulch</li> <li>• Lower Deer Creek</li> <li>• Bear Creek-Boulder Creek</li> </ul> <p>The BLM would use the land health assessments and, if applicable, causal factor determinations to inform the processing and issuances of decisions for livestock grazing permit renewals for allotments within the priority watersheds. Decisions would be issued within 5 years of the signing of the ROD for this RMP.</p> |

| Row No.         | Alternative A   | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan                                    | Alternative E 2024 Proposed RMP  |
|-----------------|---|--|---------------|---------------|--|--|--|
| -               | <b>LIVESTOCK GRAZING</b>  |  |               |               | <b>Not for analysis. For comparison only.</b>  |  | -  |
| 179.<br>(cont.) | (see above)   | (see above)  |               | (see above)   | (see above)  | (see above)  | <p>For the remaining active allotments, the BLM would use land health assessments and, if applicable, causal factor determinations to inform the processing and issuances of decisions for livestock grazing permit renewals for allotments. Decisions would be issued within 10 years of the signing of the ROD for this RMP.</p> <p>If a land health determination indicates that grazing use is not consistent with the provisions of 43 CFR 4180, the BLM, during the grazing permit renewal process, would consider both a decrease in permitted use in accordance with 43 CFR 4110.3-2 and changes to grazing practices to support the achievement of the BLM Utah Rangeland Health Standards and ensure consistency with the protection of GSENM objects.</p> |
| 180.            | <b>Management Direction:</b><br>The allotments or pastures are available as individual allotments, or they could be combined with other allotments based on the needs of the permittee and management for that allotment. | <b>Management Direction:</b><br>No similar management direction. |               |               | <b>Management Direction:</b><br>The allotments or pastures are available as individual allotments or could be combined with other allotments based on the needs of the permittee and management for that allotment. (GSENM ROD 2020) | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>No similar management direction.   |

| Row No. | Alternative A   | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP  |
|---------|---|--|---------------|---------------|--|--|--|
| -       | <b>LIVESTOCK GRAZING</b>  |  |               |               | <b>Not for analysis. For comparison only.</b>  |  | -  |
| 181.    | <p><b>Management Direction:</b><br/>In the following pastures and allotments, allow water gaps of up to 1/8 mile to provide river access to cattle while protecting the resources and other uses in the area:</p> <ul style="list-style-type: none"> <li>• Big Bowns Bench, River Pasture</li> <li>• Deer Creek Allotment, River Pasture</li> </ul>   | <p><b>Management Direction:</b><br/>No similar management direction (Big Bowns Bench Allotment is unavailable and retired; River Pasture of Deer Creek Allotment is unavailable).</p>  |               |               | <p><b>Management Direction:</b><br/>In the following pastures and allotments, allow water gaps of up to 1/8 mile to provide river access to cattle while protecting the resources and other uses in the area:</p> <ul style="list-style-type: none"> <li>• Big Bowns Bench, River Pasture</li> <li>• Deer Creek Allotment, River Pasture</li> </ul> <p>(GSENM ROD 2020)</p>  | <p><b>Actions Allowable Uses:</b><br/>No similar management direction.</p>   | <p><b>Management Direction:</b><br/>No similar management direction.</p>   |
| 182.    | <p><b>Management Direction:</b><br/>“Should grazing permits or leases be voluntarily relinquished by existing holders, the Secretary shall retire from livestock grazing the lands covered by such permits or leases pursuant to the processes of applicable law. Forage shall not be reallocated for livestock grazing purposes unless the Secretary specifically finds that such reallocation will advance the purposes of this proclamation and Proclamation 6920” (Proclamation 10286 of October 8, 2021, 86 <i>Federal Register</i> 57335. October 15, 2021).</p> <p>If a holder voluntarily relinquishes its grazing permit or lease, the lands covered by such permit or lease will automatically become unavailable for livestock grazing in accordance with Proclamation 10286.</p> <p>Upon receiving a written voluntary relinquishment of an existing grazing permit or lease, the BLM will:</p> | <p><b>Management Direction:</b><br/>Proclamation 10286 states, “Should grazing permits or leases be voluntarily relinquished by existing holders, the Secretary shall retire from livestock grazing the lands covered by such permits or leases pursuant to the processes of applicable law. Forage shall not be reallocated for livestock grazing purposes unless the Secretary specifically finds that such reallocation will advance the purposes of this proclamation and Proclamation 6920.” If a holder voluntarily relinquishes its grazing permit or lease, or portion thereof, the lands covered by such permit or lease, or portion of the lands, will automatically become unavailable for livestock grazing in accordance with Proclamation 10286.</p> <p>Upon receiving a written voluntary relinquishment of an existing grazing permit or lease, the BLM would:</p> <ul style="list-style-type: none"> <li>• Review the permittee or lessee grazing case record and verify that the permit or lease being voluntarily relinquished is valid and authorizes livestock grazing on public lands in GSENM.</li> <li>• Provide a written acknowledgment of the voluntary relinquishment to the permit or lease holder.</li> <li>• Update the Rangeland Administration System, modify the allotment record, and update other applicable records upon relinquishment.</li> <li>• Update the acreage figures in the GSENM RMP to reflect that the lands covered by the voluntarily relinquished permit or lease are unavailable for livestock grazing via plan maintenance.</li> <li>• Manage the lands previously subject to the voluntarily relinquished permit or lease for the conservation of wildlife forage and habitat. The BLM Authorized Officer will impose restrictions on applications for uses that are inconsistent with the use of the subject lands being managed for the conservation of wildlife forage and habitat.</li> <li>• Reallocate the forage associated with a voluntarily relinquished permit or lease to wildlife, unless such forage is reallocated for livestock grazing purposes to specifically enhance the protection of GSENM objects identified in Proclamation 10286.</li> <li>• Remove unnecessary range improvement projects on the lands covered by the voluntarily relinquished permit or lease and rehabilitate any water developments to a more natural state. Such removal actions may require NEPA review and decision-making.</li> </ul> <p>In the case of common allotments, the voluntary relinquishment of a grazing permit or lease by one permit or lease holder will result in a reduction of:</p> |               |               | <p><b>Management Direction:</b><br/>Comply with BLM policy for voluntary relinquishment. The authorized officer may take one or more of the following actions:</p> <ul style="list-style-type: none"> <li>• Issue a grazing permit to a different applicant.</li> <li>• Stock with livestock from another allotment with unmet resource objectives.</li> <li>• Combine with an adjacent allotment that has unmet resource objectives.</li> <li>• Consider use of the allotment as a reserve common allotment (that is, continue livestock grazing but do not recognize an individual with preference to the forage).</li> <li>• Amend or revise the land use plan to allocate forage to uses other than livestock grazing. In other words, the land use plan would be amended or revised to allocate the allotment as unavailable for livestock grazing.</li> <li>• Preference would be for one of the following:</li> <li>• Issue a grazing permit to a different applicant.</li> </ul> | <p><b>Management Direction:</b><br/>Should an allotment or a portion of an allotment become available through a voluntary relinquishment or an operation of law, it will be considered for grass banking.</p> <p>The BLM is not obligated to graze the grass bank allotment annually, and use of the grass bank by qualified applicants, permittees, or lessees is within the discretion of the BLM.</p> | <p><b>Management Direction:</b><br/>Proclamation 10286 states, “Should grazing permits or leases be voluntarily relinquished by existing holders, the Secretary shall retire from livestock grazing the lands covered by such permits or leases pursuant to the processes of applicable law. Forage shall not be reallocated for livestock grazing purposes unless the Secretary specifically finds that such reallocation would advance the purposes of this proclamation and Proclamation 6920.” If a holder voluntarily relinquishes its grazing permit or lease, or portion thereof, the lands covered by such permit or lease, or portion of the lands, would automatically become unavailable for livestock grazing in accordance with Proclamation 10286.</p> <p>The assignment of a livestock grazing permit or lease from one person or entity to another does not constitute a voluntary relinquishment and is not subject to the management actions included in this provision.</p> |

| Row No.      | Alternative A   | Alternative B   | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan | Alternative E 2024 Proposed RMP  |
|--------------|---|---|---------------|---------------|---|-------------------------------|--|
| -            | <b>LIVESTOCK GRAZING</b>  |   |               |               | <b>Not for analysis. For comparison only.</b>   |                               | -  |
| 182. (cont.) | <ul style="list-style-type: none"> <li>Review the permittee or lessee grazing case record and verify that the permit or lease being voluntarily relinquished is valid and authorizes livestock grazing on public lands in GSENM.</li> <li>Provide a written acknowledgment of the voluntary relinquishment to the permit or lease holder.</li> <li>Update the Rangeland Administration System, modify the allotment record, and update other applicable records upon relinquishment.</li> <li>Update the acreage figures in the GSENM RMP to reflect that the lands covered by the voluntarily relinquished are unavailable for livestock grazing, via plan maintenance.</li> <li>Manage the lands previously subject to the voluntarily relinquished permit or lease for the conservation of wildlife forage and habitat. The BLM Authorized Officer will impose restrictions on applications for uses that are inconsistent with the use of the subject lands being managed for the conservation of wildlife forage and habitat. Reallocate the forage associated with a voluntarily relinquished permit or lease to wildlife, unless such forage is reallocated for livestock grazing purposes to enhance the protection of GSENM objects identified in Proclamation 10286.</li> </ul> | <ul style="list-style-type: none"> <li>The overall authorized number of AUMs on the allotment as a whole. While the entire allotment would continue to be grazed by the remaining permit or lease holder(s), the voluntarily relinquished permit or lease would result in a reduction in the number of AUMs available for the allotment. The reduction would correspond to the number of permitted AUMs (including active and suspended AUMs) authorized under the voluntarily relinquished permit or lease. Increasing active AUMs on remaining permits or leases by converting suspended AUMs to active AUMs to replace the retired AUMs would not be allowed; or,</li> <li>The overall authorized number of AUMs and the geographic area available for grazing on the allotment, when all the existing holders of a permit or lease pertaining to that allotment agree, in writing, that a specific geographic portion of the allotment is appropriate to retire due to the full or partial voluntary relinquishment of a holder's permit or lease. In such case, the BLM would honor the remaining permit or lease holder(s) agreement to no longer graze that geographic area and the overall authorized number of AUMs would be reduced, as described in the previous bullet.</li> </ul> <p>A grazing permittee's or lessee's voluntary relinquishment of its livestock grazing permit or lease does not involve a BLM decision and therefore, it does not require compliance with NEPA, and it cannot be protested or appealed under 43 CFR subpart 4160. A voluntary relinquishment and the resulting retirement of the subject lands from livestock grazing does not require the BLM change the classification of any area within such lands that have been established as a grazing district under the Taylor Grazing Act. The United States is not obligated to compensate permittees/lessees for any interest in authorized range improvements used in conjunction with the relinquished permit or lease.</p> |               |               | <ul style="list-style-type: none"> <li>Stock with livestock from another allotment with unmet resource objectives.</li> <li>Combine with an adjacent allotment that has unmet resource objectives. (GSENM ROD 2020, KEPA ROD 2020)</li> </ul> | (see above)                   | <p>Upon receiving a written voluntary relinquishment of an existing grazing permit or lease, the BLM would:</p> <ul style="list-style-type: none"> <li>Verify that the permit or lease being voluntarily relinquished is valid and authorizes livestock grazing on public lands in GSENM.</li> <li>Provide a written acknowledgment of the voluntary relinquishment to the permit or lease holder.</li> <li>Update any applicable data systems, modify the allotment record, and update other applicable records upon relinquishment.</li> <li>Update the acreage figures in the GSENM RMP to reflect that the lands covered by the voluntarily relinquished permit or lease are unavailable for livestock grazing via plan maintenance.</li> <li>Unless the forage associated with the subject lands is reallocated for livestock grazing purposes to specifically enhance the protection of GSENM objects identified in Proclamation 10286, manage the lands previously subject to the voluntarily relinquished permit or lease for the conservation of wildlife forage and habitat. The BLM Authorized Officer would impose restrictions on applications for uses that are inconsistent with the use of the subject lands being managed for the conservation of wildlife forage and habitat.</li> </ul> |

| Row No.         | Alternative A   | Alternative B | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs                      | 2000 Monument Management Plan | Alternative E 2024 Proposed RMP   |
|-----------------|---|---------------|---------------|---------------|---|-------------------------------|---|
| -               | <b>LIVESTOCK GRAZING</b>  |               |               |               | <b>Not for analysis. For comparison only.</b> |                               | -   |
| 182.<br>(cont.) | <ul style="list-style-type: none"> <li>Remove unnecessary range improvement projects on the lands covered by the voluntary relinquishment and rehabilitate any water developments to a more natural state. Such actions may require NEPA review and decision-making.</li> </ul> <p>In the case of common allotments, the voluntary relinquishment of a grazing permit or lease by one permit or lease holder will result in a reduction of the overall authorized number of AUMs on the allotment as a whole. While the entire allotment would continue to be grazed by the remaining permit or lease holder(s), the voluntarily relinquished permit or lease would result in a reduction in the number of AUMs available for the allotment. The reduction would correspond to the number of permitted AUMs (including active and suspended AUMs) authorized under the voluntarily relinquished permit or lease.</p> <p>A grazing permittee's or lessee's voluntary relinquishment of its livestock grazing permit or lease does not involve a BLM decision and therefore does not require compliance with NEPA and cannot be protested or appealed under 43 CFR subpart 4160. A voluntary relinquishment and the resulting retirement of the subject lands from livestock grazing does not require the</p> | (see above)   |               |               | (see above)                                   | (see above)                   | <ul style="list-style-type: none"> <li>Consistent with available resources, remove unnecessary range improvement projects on the lands covered by the voluntarily relinquished permit or lease and rehabilitate any water developments. Such removal actions may require NEPA review and decision-making.</li> </ul> <p>In the case of common allotments, the voluntary relinquishment of a grazing permit or lease by one permit or lease holder would result in a reduction of:</p> <ul style="list-style-type: none"> <li>The overall authorized number of AUMs on the allotment as a whole. While the entire allotment would continue to be grazed by the remaining permit or lease holder(s), the voluntarily relinquished permit or lease would result in a reduction in the number of AUMs available for the allotment. The reduction would correspond to the number of permitted AUMs (including active and suspended AUMs) authorized under the voluntarily relinquished permit or lease. Increasing active AUMs on remaining permits or leases by converting suspended AUMs to active AUMs to replace the retired AUMs would not be allowed; or,</li> <li>The overall authorized number of AUMs/Head Months and the geographic area available for grazing on</li> </ul> |

| Row No.         | Alternative A   | Alternative B | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs                      | 2000 Monument Management Plan | Alternative E 2024 Proposed RMP  |
|-----------------|---|---------------|---------------|---------------|---|-------------------------------|--|
| -               | <b>LIVESTOCK GRAZING</b>  |               |               |               | <b>Not for analysis. For comparison only.</b> |                               | -  |
| 182.<br>(cont.) | BLM change the classification of any area within such lands that have been established as a grazing district under the Taylor Grazing Act. The United States is not obligated to compensate permittees/lessees for any interest in authorized range improvements used in conjunction with the relinquished permit or lease. | (see above)   |               |               | (see above)                                   | (see above)                   | <p>the allotment, when all the existing holders of a permit or lease pertaining to that allotment request, in writing, that a specific geographic portion of the allotment be retired due to the full or partial voluntary relinquishment of a holder's permit or lease. In response to such a request, the agencies would amend the applicable permit or lease to no longer authorize grazing of that geographic area and reduce the overall authorized number of AUMs/Head Months, as described in the previous bullet.</p> <p>A grazing permittee's or lessee's voluntary relinquishment of its livestock grazing permit or lease does not involve a BLM decision; therefore, it does not require compliance with NEPA, and it cannot be protested or appealed under 43 CFR 4160. A voluntary relinquishment and the resulting retirement of the subject lands from livestock grazing does not require the BLM to change the classification of any area within such lands that have been established as a grazing district under the Taylor Grazing Act. The United States is not obligated to compensate permittees/lessees for any interest in authorized range improvements used in conjunction with the relinquished permit or lease.</p> |

| Row No. | Alternative A   | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP   |
|---------|---|--|---------------|---------------|---|---|---|
| -       | <b>LIVESTOCK GRAZING</b>  |  |               |               | <b>Not for analysis. For comparison only.</b>   |   | -   |
| 183.    | <p><b>Management Direction:</b><br/>Adaptively manage season of use, duration, and distribution of livestock grazing to meet or move toward meeting the BLM Utah Rangeland Health Standards before considering changes to stocking rate (AUMs). Actions to improve land health include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• Maintain existing developments (structural and nonstructural improvements).</li> <li>• Install new developments (such as water developments and fences).</li> <li>• Implement nonstructural range improvements (such as restore shrub lands, control juniper, and control or eradicate invasive species).</li> <li>• Improve livestock distribution through range improvements, salting, supplements, or other techniques. During the permit renewal NEPA process, analyze adjustment of the season of use, duration, and recovery periods based on monitoring data. Where appropriate, provide flexibility in grazing dates, managing for conditions rather than calendar year.</li> </ul> | <p><b>Management Direction:</b><br/>Identify opportunities during the full processing of livestock grazing permit renewals to allow for adaptive management approaches that best support the achievement of the BLM Utah Rangeland Health Standards and resource management, and ensure consistency with the protection and restoration of GSENM objects. Adaptive management approaches, as incorporated into a permit's terms and conditions, may include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• Adjusting livestock distribution, season of use, grazing duration, and recovery periods.</li> <li>• Managing for measured resource conditions, rather than calendar dates.</li> </ul> |               |               | <p><b>Management Direction:</b><br/>Adaptively manage season of use, duration, and distribution of livestock grazing to meet or move toward meeting BLM Utah Rangeland Health Standards, before considering changes to stocking rate (AUMs). Actions to improve land health include, but are not limited to:</p> <ul style="list-style-type: none"> <li>• Maintain existing developments (structural and nonstructural improvements).</li> <li>• Install new developments (such as water developments and fences).</li> <li>• Implement nonstructural range improvements (such as restore shrub lands, control juniper, and control or eradicate invasive species).</li> <li>• Improve livestock distribution through range improvements, salting, supplements, or other techniques. During the permit renewal NEPA process, analyze adjustment of the season of use, duration, and recovery periods based on monitoring data. Where appropriate, provide flexibility in grazing dates, managing for conditions rather than calendar year. (GSENM ROD 2020, KEPA ROD 2020)</li> </ul> | <p><b>Management Direction:</b><br/>Water developments can be used as a management tool throughout the Monument for the following purposes: better distribution of livestock when deemed to have an overall beneficial effect on Monument resources, including water sources or riparian areas, or to restore or manage native species or populations. They can be done only when a NEPA analysis determines this tool to be the best means of achieving the above objectives and only when the water development would not dewater streams or springs.</p> <p>Developments will not be permitted to increase overall livestock numbers. Maintenance of existing developments can continue but may require NEPA analysis and must be consistent with the objectives of this Plan.</p> | <p><b>Management Direction:</b><br/>Identify opportunities during livestock grazing permit renewal processes to allow for adaptive management approaches that best support the achievement of the BLM Utah Rangeland Health Standards and resource management and ensure consistency with the protection of GSENM objects. Adaptive management approaches, as incorporated into a permit's terms and conditions, may include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• Adjusting livestock distribution, season of use, grazing duration, stocking rate (AUMs), and recovery periods</li> <li>• Managing for measured resource conditions, rather than calendar dates</li> </ul> |



| Row No. | Alternative A   | Alternative B  | Alternative C  | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan                                    | Alternative E 2024 Proposed RMP  |
|---------|---|--|--|---------------|---|--|--|
| -       | <b>LIVESTOCK GRAZING</b>  |  |  |               | <b>Not for analysis. For comparison only.</b>   |  | -  |
| 184.    | <b>Management Direction:</b><br>Any proposal to change the species of livestock to domestic sheep/goats would be considered per BLM Manual 1730 (or most recent guidance). A site-specific analysis of any proposal would be conducted to identify the level of risk to the health of wild sheep and determine whether the action can occur and still achieve effective separation between domestic sheep/goats and wild sheep. | <b>Management Direction:</b><br>Ensure that all applicable management provides for effective physical separation between domestic sheep/goats and wild sheep.  | <b>Management Direction:</b><br>Prohibit sheep or goats as a species of livestock on 10-year grazing permits.<br><br>Sheep and goats could be used, as appropriate, for vegetation management or scientific research purposes, if effective physical separation between domestic sheep/goats and wild sheep is maintained. |               | <b>Management Direction:</b><br>Any proposal to change the species of livestock to domestic sheep/goats would be considered per BLM Manual 1730 (or most recent guidance). A site-specific analysis of any proposal would be conducted to identify the level of risk to the health of wild sheep and determine whether the action can occur and still achieve effective separation between domestic sheep/goats and wild sheep. (GSENM ROD 2020, KEPA ROD 2020) | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Prohibit domestic sheep or goats as the kind (species) of livestock on 10-year grazing permits.  |
| 185.    | <b>Management Direction:</b><br>If ungrazed reference areas are established, do not exceed 0.5 percent or 80 acres, whichever is less, in any allotment or 0.5 percent within GSENM. Allotments or pastures identified as unavailable for livestock grazing may not count toward the 0.5 percent cap within GSENM.  | <b>Management Direction:</b><br>No similar management direction.   |  |               | <b>Management Direction:</b><br>If ungrazed reference areas are established, do not exceed 0.5 percent or 80 acres, whichever is less, in any allotment or 0.5 percent within GSENM. Allotments or pastures identified as unavailable for livestock grazing may not count toward the 0.5 percent cap within the monument. (GSENM ROD 2020, KEPA ROD 2020)   | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>No similar management direction.   |
| 186.    | <b>Management Direction:</b><br>Continue to use existing monitoring techniques and implement others as new methods arise. Monitoring will focus on land health.   | <b>Management Direction:</b><br>No similar management direction.   |  |               | <b>Management Direction:</b><br>Continue to use existing monitoring techniques and implement others as new methods arise. Monitoring will focus on land health. (GSENM ROD 2020, KEPA ROD 2020)   | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>No similar management direction.   |
| 187.    | <b>Management Direction:</b><br>Follow current policy (currently BLM Instruction Memorandum 2013-094, Resource Management During Drought).  | <b>Management Direction:</b><br>Implement seasonal reductions in AUMs in allotments during drought years. Use the U.S. Drought Monitor as a guide to indicate drought, coupled with the determination by the BLM Authorized Officer in communication with GSENM specialists regarding allotment-specific conditions. |  |               | <b>Management Direction:</b><br>Follow current policy (currently BLM Instruction Memorandum 2013-094, Resource Management During Drought). (GSENM ROD 2020, KEPA ROD 2020)  | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Implement seasonal reductions in AUMs in allotments during drought years. Use the U.S. Drought Monitor as a guide to indicate drought. |

| Row No. | Alternative A  | Alternative B   | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan                                     | Alternative E 2024 Proposed RMP   |
|---------|--|---|---------------|---------------|--|---|---|
| -       | <b>LIVESTOCK GRAZING</b>   |   |               |               | <b>Not for analysis. For comparison only.</b>                            |   | -   |
| -       | <i>STRUCTURAL AND NONSTRUCTURAL RANGE IMPROVEMENTS</i>                   |   |               |               | -  | -   | -   |
| 188.    | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Allow maintenance of existing structural range improvements as follows:</p> <ul style="list-style-type: none"> <li>• Essential maintenance in accordance with the terms and conditions of grazing permits in order to provide for ongoing management of livestock grazing, including repairs (such as repairs of fences, springs boxes, and line breaks) and in-kind replacements (for example, of valves, minor solar panels stands, and incidental broken elements of infrastructure).</li> <li>• Other maintenance, including that which requires environmental compliance processes, if both the structural range improvement and maintenance are consistent with the protection of GSENM objects.</li> </ul> |               |               | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p>Management Direction:<br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Allow maintenance of existing structural range improvements, where consistent with the terms and conditions of the applicable grazing permits, cooperative range improvement agreement, or range improvement permit. This includes repairs (for example, mending existing fences, repairing springs boxes, and fixing line breaks) and in-kind replacements (for example, valves, minor solar panels stands, and incidental broken elements of infrastructure).</p> |

| Row No. | Alternative A  | Alternative B  | Alternative C  | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP  |
|---------|--|--|--|---------------|--|--|--|
| -       | <b>LIVESTOCK GRAZING</b>   |  |  |               | <b>Not for analysis. For comparison only.</b>                            |  | -  |
| 189.    | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Allow modification of existing structural range improvements if both the structural range improvement and modifications are consistent with the protection of GSENM objects.</p> | <p><b>Management Direction:</b><br/>Same as Alternative B, but only if a current (within the last 10 years) land health assessment has been completed, and, if needed, a causal factor determination has been made for the allotment or applicable watershed.</p> <p>As informed by the land health assessment and causal factor determination, ensure that the modifications to the structural range improvements support the achievement of the BLM Utah Rangeland Health Standards and that they are consistent with the protection of GSENM objects.</p> <p>An exception to this restriction could be approved for modifications to structural range improvements that would prevent imminent damage to GSENM objects and resources.</p> |               | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Modifications to existing structural range improvements may be allowed, if the existing structural range improvements and its modification would:</p> <ul style="list-style-type: none"> <li>• Support the achievement of the BLM Utah Rangeland Health Standards, as informed by a current land health assessment (within the last 10 years), and, if needed, a causal factor determination; and,</li> <li>• Be consistent with the protection of GSENM objects.</li> </ul> <p>An exception to the requirement to inform modifications by a current land health assessment may be granted for modifications to structural range improvements that would exclude livestock from an area and/or prevent imminent damage to GSENM objects.</p> |

| Row No. | Alternative A  | Alternative B  | Alternative C   | Alternative D   | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP  |
|---------|--|--|---|---|--|--|--|
| -       | <b>LIVESTOCK GRAZING</b>   |  |   |   | <b>Not for analysis. For comparison only.</b>                            |  | -  |
| 190.    | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Allow new structural range improvements if both the structural range improvement and the construction are consistent with the protection of GSENM objects.</p> | <p><b>Management Direction:</b><br/>Same as Alternative B, but only if a current (within the last 10 years) land health assessment has been completed and, if needed, a causal factor determination has been made for the allotment or applicable watershed.</p> <p>An exception to this restriction could be approved for new structural range improvements that would prevent imminent damage to GSENM objects.</p> <p><u>Front Country and Passage Areas:</u><br/>As informed by the land health assessment and causal factor determination, ensure that new structural range improvements support the achievement of the BLM Utah Rangeland Health Standards and that they are consistent with the protection and restoration of GSENM objects.</p> <p><u>Outback and Primitive Areas:</u><br/>Same as Alternative D.</p> | <p><b>Management Direction:</b><br/>Allow new structural range improvements on allotments if construction is consistent with the protection of GSENM objects and only if a current (within the last 10 years) land health assessment has been completed and, if needed, a causal factor determination has been made for the allotment or applicable watershed.</p> <p>An exception to this restriction could be approved for new structural range improvements that would prevent imminent damage to GSENM objects.</p> <p>As informed by the land health assessment and causal factor determination, ensure that new structural range improvements support the achievement of the BLM Utah Rangeland Health Standards and that they would enhance the protection and restoration of GSENM objects.</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>New structural range improvements may be allowed, if the new structural range improvement and its construction would:</p> <p><u>Front Country, Passage, and Outback Areas:</u></p> <ul style="list-style-type: none"> <li>• Support the achievement of the BLM Utah Rangeland Health Standards, as informed by a current land health assessment (within the last 10 years), and, if needed, a causal factor determination; and,</li> <li>• Be consistent with the protection of GSENM objects.</li> </ul> <p><u>Primitive Area:</u></p> <ul style="list-style-type: none"> <li>• Support the achievement of the BLM Utah Rangeland Health Standards, as informed by a current land health assessment (within the last 10 years), and, if needed, a causal factor determination; and,</li> <li>• Protect and enhance GSENM objects.</li> </ul> <p>An exception to the requirement to inform modifications by a current land health assessment may be granted for new structural range improvements that would exclude livestock from an area and/or prevent imminent damage to GSENM objects.</p> |

| Row No. | Alternative A   | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan                                    | Alternative E 2024 Proposed RMP  |
|---------|---|--|---------------|---------------|---|--|--|
| -       | <b>LIVESTOCK GRAZING</b>  |  |               |               | <b>Not for analysis. For comparison only.</b>   |  | -  |
| 191.    | <b>Management Direction:</b><br>In areas available for livestock grazing, restore existing nonstructural range improvements (seedings) using a mix of native and nonnative species.   | <b>Management Direction:</b><br>No similar management direction (see <i>Vegetation</i> ).  |               |               | <b>Management Direction:</b><br>In areas available for livestock grazing, restore existing nonstructural range improvements (seedings) using a mix of native and nonnative species. (GSENM ROD 2020, KEPA ROD 2020)   | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>No similar management direction.   |
| 192.    | <b>Management Direction:</b><br>Complete land treatments to promote healthy landscapes and improve livestock management to meet rangeland health standards. Allocate the AUMs proportionally among all operators within the affected allotments. Do not implement range improvements for the primary purpose of increasing forage for livestock.<br><br>Allow creation of new nonstructural range improvements where not otherwise restricted by another designation. | <b>Management Direction:</b><br>Prohibit nonstructural range improvements with a primary purpose of increasing forage for livestock. |               |               | <b>Management Direction:</b><br>Complete land treatments to promote healthy landscapes and improve livestock management to meet rangeland health standards. Allocate the AUMs proportionally among all operators within the affected allotments. Do not implement range improvements for the primary purpose of increasing forage for livestock. (GSENM ROD 2020, KEPA ROD 2020)<br><br>Allow creation of new nonstructural range improvements where not otherwise restricted by another designation. (GSENM ROD 2020, KEPA ROD 2020) | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Prohibit nonstructural range improvements with a primary purpose of increasing forage for livestock. |
| 193.    | <b>Management Direction:</b><br>The need for and extent of range improvements is considered on a case-by-case basis and in conformance with the RMPs and with the objectives and actions in this alternative. Best practices include cutting of juniper posts or stays by permittees for the improvement or maintenance of structural range improvements.   | <b>Management Direction:</b><br>No similar management direction. (See management direction regarding range improvement.)             |               |               | <b>Management Direction:</b><br>The need for and extent of range improvements is considered on a case-by-case basis and in conformance with the RMPs and with the objectives and actions in this alternative. Best practices include cutting of juniper posts or stays by permittees for the improvement or maintenance of structural range improvements. (GSENM ROD 2020, KEPA ROD 2020)   | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>No similar management direction.   |

| Row No. | Alternative A  | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan                                    | Alternative E 2024 Proposed RMP                                  |
|---------|--|--|---------------|---------------|--|--|--|
| -       | <b>LIVESTOCK GRAZING</b>   |  |               |               | <b>Not for analysis. For comparison only.</b>  |  | -  |
| 194.    | <b>Management Direction:</b><br>Prioritize changing grazing management practices (such as changing season of use and fencing) before reducing AUMs on allotments to resolve conflicts with other uses. | <b>Management Direction:</b><br>No similar management direction. |               |               | <b>Management Direction:</b><br>Prioritize changing grazing management practices (such as changing season of use and fencing) before reducing AUMs on allotments to resolve conflicts with other uses. (GSENM ROD 2020, KEPA ROD 2020) | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>No similar management direction. |

| Row No. | Alternative A   | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP  |
|---------|---|--|---------------|---------------|--|---|--|
| -       | <b>RECREATION AND VISITOR SERVICES</b>  |  |               |               | Not for analysis. For comparison only.   |   | -  |
| 195.    | <p><b>Goal:</b><br/>Provide recreational opportunities in a variety of physical, social, and administrative settings, from primitive to rural, including front country, which allows visitors to have desired recreational experiences and enjoy the resulting benefits.</p> <p>Provide opportunities for visitor use and enjoyment of the area, consistent with resource capabilities, and mandated resource requirements.</p> | <p><b>Goal:</b><br/>Provide recreational opportunities in a variety of physical, social, and operational settings, from primitive, remote landscape to front-country landscape, which allows visitors to have desired recreational experiences and result in associated beneficial outcomes while ensuring the protection of GSENM objects and reducing conflicts with other discretionary uses.</p> |               |               | <p><b>Goal:</b><br/>Provide recreational activities in a variety of physical, social, and administrative settings, from primitive to rural (GSENM), including near-urban (KEPA), which allows visitors to have desired recreational experiences and enjoy the resulting benefits. (GSENM ROD 2020, KEPA ROD 2020)</p> <p>Provide opportunities for visitors to use and enjoyment of the area, consistent with resource capabilities, and mandated resource requirements. (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Goal:</b><br/>No similar goal.</p>  | <p><b>Goal:</b><br/>Provide recreational opportunities in a variety of physical, social, and operational settings, from primitive, remote landscapes to front-country landscape, which allows visitors to have desired recreational experiences, results in associated beneficial outcomes consistent with the protection of GSENM objects, and reduces conflicts with other discretionary uses.</p> |
| 196.    | <p><b>Goal:</b><br/>No similar goal.</p>  | <p><b>Goal:</b><br/>Recreation by both private and commercial users on GSENM would support a travel and tourism sector that is a source of economic opportunity for the region; management would be consistent with the protection of GSENM objects.</p>   |               |               | <p><b>Goal:</b><br/>No similar goal.</p>   | <p><b>Goal:</b><br/>No similar goal.</p>  | <p><b>Goal:</b><br/>Recreation by both private and commercial users on GSENM would support a travel and tourism sector that is a source of economic opportunity for the region; management would be consistent with the protection of GSENM objects.</p>   |
| 197.    | <p><b>Objective:</b><br/>Manage SRMAs and RMZs for the distinct, primary recreation-tourism market for which they were created.</p>   | <p><b>Objective:</b><br/>Manage <b>RMA</b>s in accordance with prescriptions in <b>Appendix E</b>.</p>   |               |               | <p><b>Objective:</b><br/>Manage SRMAs and RMZs for the distinct, primary recreation-tourism market for which they were created. (GSENM ROD 2020, KEPA ROD 2020)</p>  | <p><b>Objective:</b><br/>SRMAs are areas where more intensive recreation management may be needed because the area will be a focal point for visitation (Highway 12 and 89 corridors) or because recreational uses within the area need to be closely managed or limited to prevent conflicts with Monument resources (Escalante Canyons, Paria/Hackberry, and Fiftymile Mountain).</p> | <p><b>Objective:</b><br/>Manage <b>RMA</b>s in accordance with prescriptions in <b>Appendix E</b>.</p>   |

| Row No. | Alternative A  | Alternative B                              | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP            |
|---------|--|--|---------------|---------------|--|---|--|
| -       | <b>RECREATION AND VISITOR SERVICES</b>   |  |               |               | <b>Not for analysis. For comparison only.</b>  |   | -  |
| 198.    | <b>Objective:</b><br>Manage use through a range of tools, such as permits, allocations, designated recreation sites, etc.  | <b>Objective:</b><br>No similar objective. |               |               | <b>Objective:</b><br>Manage use through a range of tools, such as permits, allocations, designated recreation sites, etc. (GSENM ROD 2020, KEPA ROD 2020)  | <b>Objective:</b><br>Inventories, surveys, and studies will establish baseline data for Monument resources. These data will be used to set up an ongoing monitoring program and to prioritize areas that require more restrictive management. This will be done as part of the adaptive management framework (Chapter 3) with consultation from the GSENM Advisory Committee. | <b>Objective:</b><br>No similar objective. |
| 199.    | <b>Objective:</b><br>Maintain or improve important recreational values and sites in federal ownership to ensure a continued diversity of recreational activities, experiences, and benefits. | <b>Objective:</b><br>No similar objective. |               |               | <b>Objective:</b><br>Maintain or improve important recreational values and sites in federal ownership to ensure a continued diversity of recreation activities, experiences, and benefits. (GSENM ROD 2020, KEPA ROD 2020) | <b>Objective:</b><br>No similar objective.  | <b>Objective:</b><br>No similar objective. |
| 200.    | <b>Objective:</b><br>Provide for public health and safety through mapping and information, facility development, and visitor management.   | <b>Objective:</b><br>No similar objective. |               |               | <b>Objective:</b><br>Provide for public health and safety through mapping and information, facility development, and visitor management. (GSENM ROD 2020, KEPA ROD 2020)   | <b>Objective:</b><br>No similar objective.  | <b>Objective:</b><br>No similar objective. |
| 201.    | <b>Objective:</b><br>Manage user conflicts between recreation and other resources and uses (such as livestock grazing).  | <b>Objective:</b><br>No similar objective. |               |               | <b>Objective:</b><br>Manage user conflicts between recreation and other resources and uses (such as livestock grazing). (GSENM ROD 2020, KEPA ROD 2020)  | <b>Objective:</b><br>No similar objective.  | <b>Objective:</b><br>No similar objective. |



| Row No. | Alternative A   | Alternative B  | Alternative C  | Alternative D   | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP  |
|---------|---|--|--|---|---|---|--|
| -       | <b>RECREATION AND VISITOR SERVICES</b>  |  |  |   | Not for analysis. For comparison only.  |   | -  |
| 202.    | <p><b>Objective:</b><br/>Manage recreational areas and protect objects containing significant scenic, natural, and cultural values as well as areas with scientific importance.</p>   | <p><b>Objective:</b><br/>No similar objective.</p>   |  |   | <p><b>Objective:</b><br/>Manage recreational areas and protect objects and resources containing significant scenic, natural, and cultural values as well as areas with scientific importance. (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Objective:</b><br/>Special Recreation Management Areas (SRMAs) are areas where more intensive recreation management may be needed because the area will be a focal point for visitation (Highway 12 and 89 corridors) or because recreational uses within the area need to be closely managed or limited to prevent conflicts with Monument resources (Escalante Canyons, Paria/Hackberry, and Fiftymile Mountain).</p> | <p><b>Objective:</b><br/>No similar objective.</p>   |
| -       | <b>RECREATION MANAGEMENT AREAS</b>  |  |  |   | -   | -   | -  |
| 203.    | <p><b>Management Direction:</b><br/>Designate the following SRMAs:</p> <ul style="list-style-type: none"> <li>• Burr Trail <ul style="list-style-type: none"> <li>○ Deer Creek RMZ</li> <li>○ The Gulch RMZ</li> </ul> </li> <li>• Calf Creek</li> <li>• Hole-in-the-Rock Road <ul style="list-style-type: none"> <li>○ Dance Hall Rock RMZ</li> <li>○ Dry Fork Wash RMZ</li> <li>○ Devil’s Garden RMZ</li> <li>○ 20-Mile Dinosaur Tracks RMZ</li> <li>○ Egypt Slot Canyons RMZ</li> </ul> </li> <li>• Paria Canyons Vermilion Cliffs</li> <li>• Skutumpah</li> </ul> | <p><b>Management Direction:</b><br/>Designate the following SRMAs in accordance with prescriptions in <b>Appendix E:</b></p> <ul style="list-style-type: none"> <li>• Burr Trail Road</li> <li>• Cottonwood Canyon Road</li> <li>• Highway 12 – Escalante to Boulder <ul style="list-style-type: none"> <li>○ Lower Calf Creek RMZ</li> <li>○ Upper Calf Creek Watershed RMZ</li> <li>○ Upper Calf Creek Falls RMZ</li> </ul> </li> <li>• Highway 89</li> <li>• Phipps Death Hollow</li> </ul> | <p><b>Management Direction:</b><br/>Designate the following SRMAs in accordance with prescriptions in <b>Appendix E:</b></p> <ul style="list-style-type: none"> <li>• Burr Trail Road</li> <li>• Cottonwood Canyon Road</li> <li>• Egypt</li> <li>• Highway 12 – Escalante to Boulder</li> <li>• Hole-in-the-Rock Road</li> <li>• House Rock Valley Road</li> <li>• Little Desert</li> <li>• North Escalante Canyons</li> <li>• Old Paria</li> <li>• Paria-Hackberry Canyons</li> <li>• Phipps Death Hollow</li> <li>• Skutumpah Road</li> <li>• Spencer Flats-Red Breaks</li> <li>• Toadstools</li> </ul> | <p><b>Management Direction:</b><br/>Designate the following SRMAs in accordance with prescriptions in <b>Appendix E:</b></p> <ul style="list-style-type: none"> <li>• Burr Trail Road</li> <li>• Cottonwood Canyon Road</li> <li>• Highway 12 – Escalante to Boulder</li> <li>• Hole-in-the-Rock Road</li> <li>• House Rock Valley Road</li> <li>• Little Desert</li> <li>• North Escalante Canyons</li> <li>• Old Paria</li> <li>• Paria-Hackberry Canyons</li> <li>• Phipps Death Hollow</li> <li>• Skutumpah Road</li> <li>• Spencer Flats-Red Breaks</li> <li>• Toadstools</li> </ul> | <p><b>Management Direction:</b><br/>Designate the following SRMAs:</p> <ul style="list-style-type: none"> <li>• Calf Creek SRMA</li> <li>• Burr Trail SRMA</li> <li>• Hole-in-the-Rock Road SRMA</li> </ul>                       | <p><b>Management Direction:</b><br/>The Escalante Canyons, Paria/Hackberry, and Paria Canyons and Plateaus will continue to be managed as Special Recreation Management Areas. Fiftymile Mountain, the Highway 12 Corridor, and the U.S. Highway 89 Corridor will also be SRMAs.</p>  | <p><b>Management Direction:</b><br/>Designate the following SRMAs in accordance with prescriptions in <b>Appendix E:</b></p> <ul style="list-style-type: none"> <li>• Burr Trail Road</li> <li>• Cottonwood Canyon Road</li> <li>• Egypt</li> <li>• Highway 12 – Escalante to Boulder</li> <li>• Hole-in-the-Rock Road</li> <li>• House Rock Valley Road</li> <li>• Little Desert</li> <li>• North Escalante Canyons</li> <li>• Old Paria</li> <li>• Paria-Hackberry Canyons</li> <li>• Phipps Death Hollow</li> <li>• Skutumpah Road</li> <li>• Spencer Flats-Red Breaks</li> <li>• Toadstools</li> </ul> |

| Row No. | Alternative A   | Alternative B   | Alternative C   | Alternative D  | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP   |
|---------|---|---|---|--|---|--|---|
| -       | <b>RECREATION AND VISITOR SERVICES</b>  |   |   |  | <b>Not for analysis. For comparison only.</b>   |  | -   |
| 204.    | <p><b>Management Direction:</b><br/>Designate the following ERMA in the former GSENM Unit:</p> <ul style="list-style-type: none"> <li>• GSENM <ul style="list-style-type: none"> <li>○ Cottonwood Road RMZ</li> </ul> </li> <li>• KEPA <ul style="list-style-type: none"> <li>○ Little Desert RMZ</li> <li>○ Cottonwood Road RMZ</li> </ul> </li> </ul> | <p><b>Management Direction:</b><br/>Designate the following ERMA in accordance with prescriptions in <b>Appendix E:</b></p> <ul style="list-style-type: none"> <li>• Buckskin-Five Mile</li> <li>• Circle Cliffs-Wolverine</li> <li>• Escalante Desert</li> <li>• House Rock Valley Road</li> <li>• Kaiparowits Plateau</li> <li>• Little Desert</li> <li>• North Escalante Canyons</li> <li>• Paria-Hackberry Canyons</li> <li>• Skutumpah Terrace – Deer Range</li> </ul> | <p><b>Management Direction:</b><br/>Designate the following ERMA in accordance with prescriptions in <b>Appendix E:</b></p> <ul style="list-style-type: none"> <li>• Buckskin-Five Mile</li> <li>• Circle Cliffs-Wolverine</li> <li>• Escalante Desert</li> <li>• Fifty-mile Mountain</li> <li>• Nephi Pasture</li> <li>• Skutumpah Terrace – Deer Range</li> <li>• Smoky Mt. Left Hand Collett Roads</li> <li>• Wahweap-White Rocks</li> </ul> | <p><b>Management Direction:</b><br/>Designate the following ERMA in accordance with prescriptions in <b>Appendix E:</b></p> <ul style="list-style-type: none"> <li>• Egypt</li> <li>• House Rock Valley Road</li> <li>• Little Desert</li> <li>• North Escalante Canyons</li> <li>• Paria-Hackberry Canyons</li> <li>• Skutumpah Road</li> <li>• Spencer Flats-Red Breaks</li> </ul> | <p><b>Management Direction:</b><br/>Designate the following ERMA in the former Grand Staircase Monument Unit:</p> <ul style="list-style-type: none"> <li>• GSENM ERMA <ul style="list-style-type: none"> <li>○ Cottonwood Road RMZ</li> </ul> </li> <li>• KEPA ERMA <ul style="list-style-type: none"> <li>○ Little Desert RMZ</li> <li>○ Cottonwood Road RMZ</li> </ul> </li> </ul> <p>(GSENM ROD 2020; KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Designate the following ERMA in accordance with prescriptions in <b>Appendix E:</b></p> <ul style="list-style-type: none"> <li>• Buckskin-Five Mile</li> <li>• Circle Cliffs-Wolverine</li> <li>• Escalante Desert</li> <li>• Fifty-mile Mountain</li> <li>• Nephi Pasture</li> <li>• Skutumpah Terrace – Deer Range</li> <li>• Smoky Mt. Left Hand Collett Roads</li> <li>• Wahweap-White Rocks</li> </ul> |
| 205.    | <p><b>Management Direction:</b><br/>Within SRMAs and RMZs, until implementation-level planning is completed, dispersed vehicle camping would be allowed only in previously disturbed areas along designated routes.</p>   | <p><b>Management Direction:</b><br/>No similar management direction.</p>  |   |  | <p><b>Management Direction:</b><br/>Within SRMAs and RMZs, until implementation-level planning is completed, dispersed vehicle camping would be allowed only in previously disturbed areas along designated routes.<br/>(GSENM ROD 2020, KEPA ROD 2020)</p>   | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p>  |

| Row No. | Alternative A  | Alternative B   | Alternative C   | Alternative D   | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP   |
|---------|--|---|---|---|--|---|---|
| -       | <b>RECREATION AND VISITOR SERVICES</b>   |   |   |   | Not for analysis. For comparison only.   |   | -   |
| -       | GSENM-WIDE MANAGEMENT  |   |   |   | -  | -   | -   |
| 206.    | <p><b>Management Direction:</b><br/>Do not allow campfires in the Escalante and Paria/Hackberry Canyons, No Mans Mesa, and other relict plant areas as they are identified. Also prohibit campfires in archaeological and historic sites, rock shelters, or alcoves.</p> | <p><b>Management Direction:</b><br/>Same as Alternative A. See campfire prescriptions for RMAs (<b>Appendix E</b>).</p> | <p><b>Management Direction:</b><br/>The following area management would apply to campfires.</p> <p><u>All Areas:</u></p> <ul style="list-style-type: none"> <li>• Sensitive resource areas may be closed to campfires to protect GSENM objects.</li> </ul> <p><u>Front Country Area:</u></p> <ul style="list-style-type: none"> <li>• Allow campfires only in designated fire grates. Do not allow campfire wood collecting. Require removal of unused, imported firewood.</li> </ul> <p><u>Passage Area:</u></p> <ul style="list-style-type: none"> <li>• Allow campfires in designated fire grates or fire pans/blankets. Where fire pans/blankets are used, ash removal is recommended. Do not allow campfire wood collecting. Require removal of unused, imported firewood.</li> </ul> <p><u>Outback Area:</u></p> <ul style="list-style-type: none"> <li>• Allow campfires and recommend the use of fire grates or fire pans/blankets. Where fire pans/blankets are used, ash removal is recommended. Allow collection of dead and down wood. Require removal of unused, imported firewood.</li> </ul> | <p><b>Management Direction:</b></p> <ul style="list-style-type: none"> <li>• Do not allow fires except in designated fire grates.</li> <li>• Do not allow campfire wood collecting.</li> <li>• Require removal of unused, imported firewood.</li> </ul> | <p><b>Management Direction:</b><br/>Do not allow campfires in the Escalante and Paria/Hackberry Canyons, No Mans Mesa, and other relict plant areas as they are identified. Also prohibit campfires in archaeological and historic sites, rock shelters, or alcoves. (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>In addition to the general provisions provided elsewhere for use management, the following provisions apply to hanging gardens and relict areas. Camping, overnight stays, and campfires in these areas [hanging gardens and relict plant communities] will not be allowed.</p> | <p><b>Management Direction:</b><br/>The following area management would apply to campfires.</p> <p><u>All Areas:</u></p> <ul style="list-style-type: none"> <li>• Sensitive resource areas may be closed to campfires to protect GSENM objects and resources.</li> <li>• Do not allow campfires on No Mans Mesa or the canyon floors in the Escalante River and Paria River Canyon systems, including tributaries.</li> </ul> <p><u>Front Country Area:</u></p> <ul style="list-style-type: none"> <li>• Allow campfires only in designated fire grates. Campfire wood collecting is not allowed. Removal of unused imported firewood is required.</li> </ul> <p><u>Passage Area:</u></p> <ul style="list-style-type: none"> <li>• Campfires are allowed only in designated fire grates or fire pans/blankets. Require removal of unused, imported firewood. Do not allow campfire wood collecting.</li> </ul> <p><u>Outback Area:</u></p> <ul style="list-style-type: none"> <li>• Allow campfires. The use of fire grates or fire pans/blankets and removal of ash is recommended. Require removal of unused, imported firewood. Allow collection of dead and down wood for campfires.</li> </ul> |

| Row No.         | Alternative A  | Alternative B  | Alternative C   | Alternative D  | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP   |
|-----------------|--|--|---|--|--|---|---|
| -               | <b>RECREATION AND VISITOR SERVICES</b>   |  |   |  | <b>Not for analysis. For comparison only.</b>  |   | -   |
| 206.<br>(cont.) | (see above)  | (see above)  | <p><b>Primitive Area:</b><br/>Same as outback area with the following addition:</p> <ul style="list-style-type: none"> <li>• Campfires not allowed below the rims of the Escalante and Paria/Hackberry Canyons, and on No Mans Mesa. Allow collection of dead and down wood where campfires are allowed.</li> </ul> | (see above)  | (see above)  | (see above)   | <p><b>Primitive Area:</b><br/>Same as outback area with the following addition:</p> <ul style="list-style-type: none"> <li>• Allow collection of dead and down wood where campfires are allowed.</li> </ul>   |
| 207.            | <p><b>Management Direction:</b><br/>Allow camping adjacent to range facilities and isolated water sources unless otherwise posted.</p> | <p><b>Management Direction:</b><br/>No similar management direction (see camping prescriptions for RMAs [Appendix E]).</p> | <p><b>Management Direction:</b><br/>Where recreation use creates conflicts at grazing facilities and where the BLM Authorized Officer determines those conflicts merit BLM response, the BLM may limit recreational use to reduce conflicts. Limits may depend on the season of use of the grazing allotment.</p>   | <p><b>Management Direction:</b><br/>No similar management direction: (see camping prescriptions for RMAs [Appendix E]). Allow dispersed camping in areas outside RMAs.</p> | <p><b>Management Direction:</b><br/>Allow camping adjacent to range facilities and isolated water sources unless otherwise posted. (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>A clarification has been made that authorizations for overnight camping and exceptions to group size limits could be provided for in valid grazing permits if the activity does not involve outfitter and guide operations or special events. These provisions may be necessary for the proper operation of a valid grazing permit and are more appropriately authorized within the terms of that permit rather than in recreational visitor permits.</p> | <p><b>Management Direction:</b><br/>Where recreation use creates conflicts at grazing facilities and where the BLM Authorized Officer determines those conflicts merit BLM response, the BLM may limit recreational use to reduce conflicts. Limits may depend on the season of use of the grazing allotment.</p> |

| Row No. | Alternative A   | Alternative B   | Alternative C  | Alternative D   | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP  |
|---------|---|---|--|---|---|--|--|
| -       | <b>RECREATION AND VISITOR SERVICES</b>  |   |  |   | Not for analysis. For comparison only.  |  | -  |
| 208.    | <p><b>Management Direction:</b><br/>Develop new parking lots, restrooms, and other recreation facilities along open travel routes or other appropriate areas.</p> | <p><b>Management Direction:</b><br/>Allow recreation facilities in accordance with RMA prescriptions (<b>Appendix E</b>).</p>   | <p><b>Management Direction:</b><br/><u>Front Country and Passage Areas:</u><br/>Recreation facilities with utilities or paved surfaces could be provided.</p> <p><u>Outback Areas:</u><br/>Recreation facilities, in limited cases, would be allowed only where other management direction for resource protection prove to be ineffective.</p> <p><u>Primitive Area:</u><br/>Recreation facilities would not be provided.</p> | <p><b>Management Direction:</b><br/>Allow recreation facilities in accordance with RMA prescriptions (<b>Appendix E</b>). For areas outside RMAs, new recreation facilities would not be provided. Sensitive resource areas may be closed to camping.</p> | <p><b>Management Direction:</b><br/>Develop new parking lots, restrooms, and other recreation facilities along open travel routes or other appropriate areas. (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>In an effort to protect Monument resources and provide economic opportunities in the local communities, major facilities and the services associated with them will be located in these communities, outside the Monument. These include a Monument headquarters in Kanab, an Interagency Office in Escalante, and visitor contact stations in Cannonville, Glendale, and Big Water. Their precise locations will be based on factors such as the availability of infrastructure; economic considerations, including market feasibility; the availability of financing; and managerial concerns. These determinations will be made by the communities and the BLM. Any construction activities associated with these sites are contingent upon funding by Congress. Monument staff will also be available at the Paria Contact Station and at the Anasazi State Park in Boulder.</p> | <p><b>Management Direction:</b><br/><u>Front Country and Passage Areas:</u><br/>Recreation facilities with utilities or paved surfaces could be provided.</p> <p><u>Outback Areas:</u><br/>Recreation facilities, in limited cases, would be allowed only where other management direction for resource protection prove to be ineffective.</p> <p><u>Primitive Area:</u><br/>Recreation facilities would not be provided.</p> |
| 209.    | <p><b>Management Direction:</b><br/>No similar management direction.</p>  | <p><b>Management Direction:</b><br/>Signage <b>would</b> be provided as needed for safety, resource protection, identification, orientation, and interpretive/educational purposes.</p>                                 |  |   | <p><b>Management Direction:</b><br/>No similar management direction.</p>  | <p><b>Management Direction:</b><br/>As the focal point for visitation, visitor day-use facilities and signs will be added as necessary for visitor use, safety, and the protection of sensitive resources.</p>   | <p><b>Management Direction:</b><br/>Signage <b>would</b> be provided as needed for safety, resource protection, identification, orientation, and interpretive/educational purposes.</p>  |
| 210.    | <p><b>Management Direction:</b><br/>No similar management direction.</p>  | <p><b>Management Direction:</b><br/>Permanent fixed climbing anchors outside WSAs could be permitted if shown to be consistent with the protection of GSENM objects and <b>if</b> they would enhance public safety.</p> |  | <p><b>Management Direction:</b><br/>Prohibit new fixed climbing anchors in GSENM.</p>   | <p><b>Management Direction:</b><br/>No similar management direction.</p>  | <p><b>Management Direction:</b><br/>The BLM will work with the public to identify climbing areas and develop specific management plans for them. Criteria for designation of climbing areas will be established for the Monument.</p>  | <p><b>Management Direction:</b><br/><b>(Same as Alternative C)</b><br/>Permanent fixed climbing anchors outside WSAs could be permitted if shown to be consistent with the protection of GSENM objects and if they would enhance public safety.</p>  |

| Row No. | Alternative A  | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP  |
|---------|--|--|---------------|---------------|--|---|--|
| -       | <b>RECREATION AND VISITOR SERVICES</b>                                   |  |               |               | <b>Not for analysis. For comparison only.</b>                            |   | -  |
| 211.    | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Canyoneering, rappelling, and climbing restrictions:</p> <ul style="list-style-type: none"> <li>• Not allowed in paleontological and archaeological sites, natural bridges, arches, and flowing or active waterfalls.</li> <li>• Special Status Species habitat would be closed as needed to protect species.</li> <li>• Areas may be buffered or seasonally closed to prevent disturbance to raptor nesting.</li> </ul> |               |               | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b></p> <ul style="list-style-type: none"> <li>• Climbing will not be allowed in archaeological sites, on natural bridges or arches, or within identified threatened and endangered species nesting areas.</li> <li>• Climbing areas may be seasonally closed to assure that disturbance to raptor nesting activities does not occur.</li> <li>• The BLM will work with the public to identify climbing areas and develop specific management plans for them. Criteria for designation of climbing areas will be established for the Monument.</li> <li>• Climbing will be subject to zone and other specific management restrictions.</li> </ul> | <p><b>Management Direction:</b><br/>Canyoneering, rappelling, and climbing restrictions:</p> <ul style="list-style-type: none"> <li>• Not allowed in paleontological and archaeological sites, natural bridges, arches, and flowing or active waterfalls.</li> <li>• Special Status Species habitat would be closed as needed to protect species.</li> <li>• Areas may be buffered or seasonally closed to prevent disturbance to raptor nesting.</li> </ul> |

| Row No. | Alternative A   | Alternative B  | Alternative C   | Alternative D  | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP   |
|---------|---|--|---|--|--|--|---|
| -       | <b>RECREATION AND VISITOR SERVICES</b>  |  |   |  | <b>Not for analysis. For comparison only.</b>  |  | -   |
| 212.    | <p><b>Management Direction:</b><br/>Create campgrounds or designated dispersed camping areas to support management goals and objectives for other resources.</p> <p>Prohibit camping in alcoves, adjacent to rock writing sites, and within historic or prehistoric sites listed or eligible for listing on the National Register of Historic Places (National Register). Additional camping restrictions may be included on SRPs to reduce or eliminate impacts on archaeological sites.</p> | <p><b>Management Direction:</b><br/>Allow camping in accordance with RMA prescriptions (<b>Appendix E</b>). Sensitive resource areas may be closed to camping consistent with the protection of GSENM objects.</p> | <p><b>Management Direction:</b><br/><u>All Areas:</u><br/>Allow camping in accordance with RMA prescriptions (<b>Appendix E</b>). Sensitive resource areas outside RMAs may be closed to camping.</p> <p><u>Front Country Area:</u><br/>Allow camping only in developed campgrounds.</p> <p><u>Passage Area:</u><br/>Allow camping only in developed campgrounds or designated camping areas.</p> <p><u>Outback and Primitive Areas:</u><br/>Allow dispersed camping. Designated dispersed camping areas may be identified and designated on an as-needed basis. Areas may be closed to camping to protect GSENM objects.</p> | <p><b>Management Direction:</b><br/>Allow camping in accordance with RMA prescriptions (<b>Appendix E</b>). For areas outside RMAs, camping is allowed. Sensitive resource areas may be closed to camping.</p> | <p><b>Management Direction:</b><br/>Create campgrounds or designated dispersed camping areas to support management goals and objectives for other resources. (GSENM ROD 2020, KEPA ROD 2020)</p> <p>Prohibit camping in alcoves, adjacent to rock art sites, and within historic or prehistoric sites listed or eligible for listing on the National Register. Additional camping restrictions may be included on SRPs to reduce or eliminate impacts on archaeological sites. (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>Allow camping in developed campgrounds or in designated primitive camping areas in the front country and passage zones. Prohibit dispersed primitive camping in these zones.</p> | <p><b>Management Direction:</b><br/>The following management would apply to camping.</p> <p><u>All Areas:</u></p> <ul style="list-style-type: none"> <li>• Allow camping in accordance with management area and RMA prescriptions (<b>Appendix E</b>).</li> <li>• Require permits for overnight use.</li> <li>• Areas may be closed to camping to protect GSENM objects and resources.</li> <li>• Prohibit dispersed camping adjacent to rock writing sites, in alcoves with known prehistoric sites, and within historic or prehistoric sites listed or eligible for listing on the National Register.</li> <li>• Camping stay limit: 14 days. Campers must relocate at least a 30-mile radius away and may not return within 30 days to a previous campsite.</li> <li>• Camping quiet hours: 10:00 p.m. to 7:00 a.m.</li> </ul> <p><u>Front Country Area:</u><br/>Allow camping only in campgrounds.</p> <p><u>Passage Area:</u><br/>Allow camping only in campgrounds or designated camping areas.</p> <p><u>Outback and Primitive Areas:</u><br/>Allow dispersed camping. Designated camping areas may be identified on an as-needed basis.</p> |

| Row No. | Alternative A  | Alternative B  | Alternative C  | Alternative D  | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP   |
|---------|--|--|--|--|--|--|---|
| -       | <b>RECREATION AND VISITOR SERVICES</b>   |  |  |  | Not for analysis. For comparison only.   |  | -   |
| 213.    | <p><b>Management Direction:</b><br/>Prohibit nonmotorized/nonmechanized cross-country competitive events. Allow nonmotorized/mechanized competitive events only along designated routes.</p> | <p><b>Management Direction:</b><br/>Nonmotorized competitive events on designated routes may be considered by the authorizing officer. For group size limitations, see RMA prescriptions in <b>Appendix E</b>.<br/><br/>Prohibit motorized competitive events.</p> | <p><b>Management Direction:</b><br/><u>All Areas:</u><br/>Prohibit competitive motorized events.<br/><br/><u>Front Country, Passage, and Outback Areas:</u><br/>Same as Alternative B.<br/><br/><u>Primitive Areas:</u><br/>Same as Alternative D.</p> | <p><b>Management Direction:</b><br/>Prohibit all competitive events.</p> | <p><b>Management Direction:</b><br/>Prohibit nonmotorized/nonmechanized cross-country competitive events. Allow nonmotorized/mechanized competitive events only along designated routes (GSENM ROD 2020).<br/><br/>Allow nonmotorized/nonmechanized cross-country competitive events on a case-by-case basis. Allow mechanized cross-country competitive events on a case-by-case basis (KEPA ROD 2020).</p> | <p><b>Management Direction:</b><br/>No competitive events will be allowed.</p> | <p><b>Management Direction:</b><br/><u>All Areas:</u><br/>Prohibit competitive motorized events.<br/><br/><u>Front Country, Passage, and Outback Areas:</u><br/>Nonmotorized competitive events on designated open routes may be considered by the authorizing officer.<br/><br/><u>Primitive Areas:</u><br/>Prohibit all competitive events.</p> |
| 214.    | <p><b>Management Direction:</b><br/>No similar management direction.</p>   | <p><b>Management Direction:</b><br/>Multiyear SRPs are subject to annual review to ensure the continued consistency with recreational objectives and the protection of GSENM objects.</p>  |  |  | <p><b>Management Direction:</b><br/>No similar management direction.</p>   | <p><b>Management Direction:</b><br/>No similar management direction.</p>       | <p><b>Management Direction:</b><br/>Multiyear SRPs are subject to annual review to ensure the continued consistency with recreational objectives and the protection of GSENM objects.</p>   |



| Row No. | Alternative A   | Alternative B   | Alternative C  | Alternative D   | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP  |
|---------|---|---|--|---|---|---|--|
| -       | <b>RECREATION AND VISITOR SERVICES</b>  |   |  |   | Not for analysis. For comparison only.  |   | -  |
| 215.    | <p><b>Management Direction:</b><br/>Limit motorized and mechanized events to areas designated for motorized and mechanized use.</p> | <p><b>Management Direction:</b><br/>Motorized and nonmotorized SRPs on designated routes may be considered by the BLM Authorized Officer. For group size limitations, see RMA prescriptions in <b>Appendix E</b>.</p> | <p><b>Management Direction:</b><br/><u>For All Areas:</u><br/>Group sizes would conform to the requirements of the most restrictive area in which the event occurs. SRPs would be issued for noncompetitive events with the following limitations:</p> <p><u>Front Country and Passage Areas:</u></p> <ul style="list-style-type: none"> <li>• Ensure a maximum of 15 vehicles per group on any given route.</li> </ul> <p><u>Outback Area:</u></p> <ul style="list-style-type: none"> <li>• Maximum of 15 vehicles per group on any given route.</li> <li>• Prohibit SRPs that provide for intentional visitation to cultural sites, except for approved visitation to designated public cultural sites or sites approved by the BLM.</li> </ul> <p><u>Primitive Area:</u></p> <ul style="list-style-type: none"> <li>• Prohibit noncompetitive motorized SRP events.</li> <li>• Prohibit SRPs that provide for intentional visitation to cultural sites, except for approved visitation to designated public cultural sites or approved sites by the BLM.</li> <li>• Limit the number of SRPs to ensure that an undeveloped, primitive, and self-directed visitor experience is achieved.</li> </ul> | <p><b>Management Direction:</b><br/>Prohibit motorized noncompetitive SRPs. Allow for nonmotorized SRPs with the following limitations:</p> <ul style="list-style-type: none"> <li>• Prohibit SRPs that provide for intentional visitation to cultural sites, except for approved visitation to designated public cultural sites or approved sites by the BLM.</li> <li>• Limit the number of SRPs in WSAs and lands being managed to protect wilderness characteristics to ensure that an undeveloped, primitive, and self-directed visitor experience is achieved.</li> </ul> | <p><b>Management Direction:</b><br/>Limit motorized and mechanized events to areas designated for motorized and mechanized use. (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>Special events may be approved, under permit, if the event meets other zone requirements and Plan provisions.</p> <p>Special events will be permitted in accordance with the requirements of the most restrictive zone that the event encounters.</p> | <p><b>Management Direction:</b><br/>SRPs may be issued for noncompetitive events with the following limitations:</p> <p><u>For All Areas:</u></p> <ul style="list-style-type: none"> <li>• Ensure group sizes would conform to the requirements of the most restrictive area in which the event occurs.</li> <li>• Prohibit SRPs that provide for intentional visitation to cultural sites, except for approved visitation to designated public cultural sites or approved sites by the BLM.</li> </ul> <p><u>Front Country, Passage, and Outback Areas:</u></p> <ul style="list-style-type: none"> <li>• Allow noncompetitive motorized SRP events on designated routes.</li> <li>• Ensure a maximum of 15 vehicles per group.</li> </ul> <p><u>Primitive Area:</u></p> <ul style="list-style-type: none"> <li>• Prohibit noncompetitive motorized SRP events.</li> <li>• Limit the number of SRPs to ensure that an undeveloped, primitive, and self-directed visitor experience is achieved.</li> </ul> |

| Row No. | Alternative A  | Alternative B  | Alternative C  | Alternative D   | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP   |
|---------|--|--|--|---|--|--|---|
| -       | <b>RECREATION AND VISITOR SERVICES</b>   |  |  |   | <b>Not for analysis. For comparison only.</b>  |  | -   |
| 216.    | <p><b>Management Direction:</b><br/>Where appropriate, group size limits are identified for individual SRMAs and RMZs. Where necessary, the agency may modify these decisions. For example, more restrictive group size limits may be necessary to be consistent with the management of NPS units or to protect opportunities for solitude or primitive and unconfined recreation in certain WSAs. Group size limits also may be adjusted to protect other resource values like riparian or wildlife resources.</p> <p>Within WSAs, group size will be limited to 25 people unless otherwise noted in SRMA/RMZ management actions. Groups over 25 would require approval from the BLM Authorized Officer. Group size limits in WSAs supersede ERMA, SRMA, and RMZ group size limits. On a case-by-case basis, group size limits, where applicable, could be adjusted within WSAs for consistency with group size limits on adjacent lands (such as NPS land and KFO land).</p> | <p><b>Management Direction:</b><br/>Limit group size in accordance with RMA prescriptions (<b>Appendix E</b>). Exceptions to group size limits would be considered as part of an SRP on a case-by-case basis approved by the BLM Authorized Officer. Group size limits may also be adjusted to protect other resource values like riparian, vegetation, or wildlife resources.</p> <p>Within WSAs, group size will be limited to 25 people unless further restricted in SRMA/RMZ management actions.</p> | <p><b>Management Direction:</b><br/><u>Limit the group size as follows.</u></p> <p><u>Front Country Area:</u></p> <ul style="list-style-type: none"> <li>• 75 individuals</li> </ul> <p><u>Passage Area:</u></p> <ul style="list-style-type: none"> <li>• 25 individuals</li> </ul> <p><u>Outback Area:</u></p> <ul style="list-style-type: none"> <li>• 25 individuals</li> </ul> <p><u>Primitive Area:</u></p> <ul style="list-style-type: none"> <li>• 12 individuals</li> </ul> <p>Group size limits in SRMAs supersede these allowances.</p> <p>Exceptions to group size limits would be considered as part of an SRP on a case-by-case basis approved by the BLM Authorized Officer.</p> | <p><b>Management Direction:</b><br/>Limit group size in accordance with RMA prescriptions (<b>Appendix E</b>). For areas outside RMAs, limit group sizes to 25 individuals.</p> | <p><b>Management Direction:</b><br/>Where appropriate, group size limits are identified for individual SRMAs and RMZs. Where necessary, the agency may modify these decisions. For example, more restrictive group size limits may be necessary to be consistent with management of NPS units or protect opportunities for solitude or primitive and unconfined recreation in certain WSAs. Group size limits may also be adjusted to protect other resource values like riparian or wildlife resources. (GSENM ROD 2020, KEPA ROD 2020)</p> <p>Within WSAs, group size will be limited to 25 people unless otherwise noted in SRMA/RMZ management actions. Groups over 25 would require approval of the authorized officer. Group size limits in WSAs supersede ERMA, SRMA, and RMZ group size limits. On a case-by-case basis, group size limits, where applicable, could be adjusted within WSAs for consistency with group size limits on adjacent lands (such as NPS land, KFO land). (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>Group size will be limited to 25 people in the passage and outback zones. Permits for groups over 25 people will be considered in the passage and outback zones, if the number of people and the activities proposed are consistent with the protection of monument resources. Appropriate NEPA analysis will be prepared on areas where permits could be authorized. These permits will require that adequate sanitation and trash collection are provided, and that activities take place in areas where resources will not be damaged. In the primitive zone, group size will be limited to 12 people and 12 pack animals. Within the Paria River corridor in the primitive zone, permits could be approved for groups over 12 people up to a maximum of 25 people. In order to protect monument resources, it may become necessary to place limits on the overall numbers of people and/or pack animals allowed, or to further restrict group sizes in areas where resource damage is occurring.</p> | <p><b>Management Direction:</b><br/><u>Limit the group size as follows.</u></p> <p><u>Front Country Area:</u></p> <ul style="list-style-type: none"> <li>• 75 individuals</li> </ul> <p><u>Passage Area:</u></p> <ul style="list-style-type: none"> <li>• 25 individuals</li> </ul> <p><u>Outback Area:</u></p> <ul style="list-style-type: none"> <li>• 25 individuals</li> </ul> <p><u>Primitive Area:</u></p> <ul style="list-style-type: none"> <li>• 12 individuals</li> </ul> <p>Group size limits in SRMAs supersede these allowances.</p> <p>On a case-by-case basis, the BLM Authorized Officer may approve exceptions to group size limits, if consistent with the protection of GSENM objects.</p> |

| Row No. | Alternative A   | Alternative B   | Alternative C   | Alternative D   | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan                                    | Alternative E 2024 Proposed RMP   |
|---------|---|---|---|---|---|--|---|
| -       | <b>RECREATION AND VISITOR SERVICES</b>  |   |   |   | Not for analysis. For comparison only.  |  | -   |
| 217.    | <b>Management Direction:</b><br>Require the use of disposable, self-contained human waste management systems within 300 feet of a water source.   | <b>Management Direction:</b><br>Require the use of personal waste systems within 300 feet of a water source, unless facilities are provided. Or in accordance with RMA prescriptions ( <b>Appendix E</b> ).<br><br>Additional areas may be identified based on monitoring visitation use levels and resource impacts.           | <b>Management Direction:</b><br>Require the use of personal waste systems within 300 feet of a water source, unless facilities are provided. Or in accordance with RMA prescriptions ( <b>Appendix E</b> ).<br><br>Additional areas may be identified based on monitoring visitation use levels and resource impacts.   | <b>Management Direction:</b><br>Require the use of personal waste systems, unless facilities are provided.                    | <b>Management Direction:</b><br>Require the use of disposable, self-contained human waste management systems within 300 feet of a water source. (GSENM ROD 2020, KEPA ROD 2020)   | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Require the use of personal waste systems within 330 feet of a water source, unless facilities are provided.<br><br>Additional areas may be identified based on monitoring visitation use levels and resource impacts.  |
| 218.    | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>Require the use of personal waste systems in accordance with RMA prescriptions ( <b>Appendix E</b> ).   |   | <b>Management Direction:</b><br>Require the use of personal waste systems, unless facilities are provided.                    | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Require the use of personal waste systems in accordance with RMA prescriptions ( <b>Appendix E</b> ).   |
| 219.    | <b>Management Direction:</b><br>Prohibit recreational shooting within at least 0.25 miles of residences, campgrounds, and developed recreation sites and areas, or greater depending on area-specific conditions. | <b>Management Direction:</b><br>Prohibit recreational shooting from, on, or across highways and within 0.25 miles of residences, campgrounds, and developed recreation facilities.<br><br>Prohibit recreational shooting in WSAs/ISAs and RNAs (ACECs).<br><br>These prohibitions do not pertain to the lawful pursuit of game. | <b>Management Direction:</b><br><u>Front Country Area:</u><br>Prohibit recreational shooting.<br><br><u>Passage and Outback Areas:</u><br>Prohibit recreational shooting from, on, or across highways and within 0.25 miles of residences, campgrounds, and developed recreation facilities.<br><br><u>Primitive Area:</u><br>Prohibit recreational shooting.<br><br>These prohibitions do not pertain to the lawful pursuit of game. | <b>Management Direction:</b><br>Prohibit recreational shooting in GSENM. This does not pertain to the lawful pursuit of game. | <b>Management Direction:</b><br>Prohibit recreational shooting within at least 0.25 miles of residences, campgrounds, and developed recreation sites and areas, or greater depending on area-specific conditions. (GSENM ROD 2020, KEPA ROD 2020) | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br><u>All Areas:</u><br>Prohibit recreational shooting within 600 feet of locations with archaeological and historic resources.<br><br><u>Front Country Area:</u><br>Prohibit recreational shooting.<br><br><u>Passage, Outback, and Primitive Areas:</u><br>Prohibit recreational shooting within 600 feet of residences, campgrounds, developed recreation facilities, and the four routes listed below.<br><ul style="list-style-type: none"> <li>• The Hole-in-the-Rock Road</li> <li>• Skutumpah Road</li> <li>• House Rock Valley Road</li> <li>• Johnson Canyon Road</li> </ul> |

| Row No. | Alternative A   | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan                                    | Alternative E 2024 Proposed RMP                                  |
|---------|---|--|---------------|---------------|---|--|--|
| -       | <b>RECREATION AND VISITOR SERVICES</b>  |  |               |               | <b>Not for analysis. For comparison only.</b>   |  | -  |
| 220.    | <b>Management Direction:</b><br>Prohibit SRP holders from camping within 200 feet of riparian areas. If site-specific analysis can demonstrate that there will be no impacts on riparian vegetation or PFC, then exceptions could be granted. | <b>Management Direction:</b><br>No similar management direction. |               |               | <b>Management Direction:</b><br>Prohibit SRP holders from camping within 200 feet of riparian areas. If site-specific analysis can demonstrate that there will be no impacts on riparian vegetation or PFC, then exceptions could be granted. (GSENM ROD 2020, KEPA ROD 2020) | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>No similar management direction. |

| Row No. | Alternative A  | Alternative B   | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP  |
|---------|--|---|---------------|---------------|--|--|--|
| -       | <b>RECREATION AND VISITOR SERVICES</b>   |   |               |               | <b>Not for analysis. For comparison only.</b>  |  | -  |
| 221.    | <p><b>Management Direction:</b><br/>Issuance of an SRP is a discretionary action, consistent with current BLM policy for activities that (1) support recreation and visitor services objectives/direction, (2) satisfy a public demand that is not being met, and (3) would not cause public health and safety issues. Note: the BLM has discretion over whether to issue an SRP (43 CFR 2932.26).</p> | <p><b>Management Direction:</b><br/>To protect GSENM objects and resources, to control crowding, and/or to meet recreational objectives, the BLM may:</p> <ul style="list-style-type: none"> <li>• Require the public to obtain permits to engage in noncommercial recreational use</li> <li>• Impose limitations on the number of commercial and noncommercial permits issued for a given area over a certain time period</li> </ul> <p>To determine when and where such permits and limitations may be needed or changed, the BLM may consider, among other indicators, the following:</p> <ul style="list-style-type: none"> <li>• Resource damage (such as proliferation of campsites; human waste problems; social trailing; vandalism to historic, archaeological, and paleontological sites; damage to vegetation; or destruction of biological soil crusts)</li> <li>• Conflicts with threatened and endangered plant or animal species</li> <li>• User conflicts</li> <li>• Impacts on culturally sensitive areas and Tribal Nations' ability to engage in traditional and ceremonial practices</li> </ul> |               |               | <p><b>Management Direction:</b><br/>Issuance of an SRP is a discretionary action, consistent with current BLM policy for activities that (1) support recreation and visitor services objectives/direction, (2) satisfy a public demand that is not being met, and (3) would not cause public health and safety issues. Note: the BLM has discretion over whether to issue an SRP (43 CFR 2932.26). (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>Approve, under permit, special events and commercial operations if the event is consistent with other plan management.</p> | <p><b>Management Direction:</b><br/>To protect GSENM objects, to control crowding, and/or to meet recreational objectives, the BLM may:</p> <ul style="list-style-type: none"> <li>• Require the public to obtain permits to engage in noncommercial recreational use.</li> <li>• Impose limitations on the number of commercial and noncommercial permits issued for a given area.</li> </ul> <p>To determine when and where such permits and limitations may be needed or changed, the BLM may consider, among other indicators, the following:</p> <ul style="list-style-type: none"> <li>• Resource damage (such as proliferation of campsites; human waste problems; social trailing; vandalism to historic, archaeological, and paleontological sites; damage to vegetation; or destruction of biological soil crusts)</li> <li>• Conflicts with threatened and endangered plant or animal species</li> <li>• User conflicts</li> <li>• Impacts on culturally sensitive areas and Tribal Nations' ability to engage in traditional and ceremonial practices</li> </ul> |

| Row No. | Alternative A  | Alternative B   | Alternative C  | Alternative D  | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP  |
|---------|--|---|--|--|--|---|--|
| -       | <b>RECREATION AND VISITOR SERVICES</b>                                   |   |  |  | <b>Not for analysis. For comparison only.</b>                            |   | -  |
| 222.    | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Limit recreational stock (pack) in accordance with RMA prescriptions (<b>Appendix E</b>).</p> | <p><b>Management Direction:</b><br/>Unless otherwise specified for SRMAs/ERMAs/RMZs, limit recreational stock (pack) animals to the following number of pack animals per area:</p> <p><u>Front Country Area:</u></p> <ul style="list-style-type: none"> <li>• 25 animals</li> </ul> <p><u>Passage and Outback Areas:</u></p> <ul style="list-style-type: none"> <li>• 25 animals</li> </ul> <p><u>Primitive Area:</u></p> <ul style="list-style-type: none"> <li>• 12 animals</li> </ul> | <p><b>Management Direction:</b><br/>Limit recreational stock (pack) in accordance with RMA prescriptions (<b>Appendix E</b>). For areas outside RMAs, limit recreational stock (pack) to 12 animals.</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Recreational stock are limited to 12 animals in the primitive zone.</p> | <p><b>Management Direction:</b><br/>Unless otherwise specified for SRMAs/ERMAs/RMZs, limit recreational stock (pack) animals to the following number of pack animals per group per area:</p> <p><u>Front Country Area:</u></p> <ul style="list-style-type: none"> <li>• 25 animals</li> </ul> <p><u>Passage and Outback Areas:</u></p> <ul style="list-style-type: none"> <li>• 25 animals</li> </ul> <p><u>Primitive Area:</u></p> <ul style="list-style-type: none"> <li>• 12 animals</li> </ul> |

| Row No. | Alternative A  | Alternative B   | Alternative C  | Alternative D  | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP  |
|---------|--|---|--|--|--|--|--|
| -       | <b>RECREATION AND VISITOR SERVICES</b>   |   |  |  | Not for analysis. For comparison only.   |  | -  |
| 223.    | <p><b>Management Direction: VENDING</b><br/>No similar management direction.</p> | <p><b>Management Direction: VENDING</b><br/>Vending would be allowed based on prescriptions in associated RMAs.</p> | <p><b>Management Direction: VENDING</b><br/><u>Front Country and Passage Areas:</u><br/>Vending would be allowed by permit on a case-by-case basis, in association with approved special events or recreation sites. Generally, permits could be issued to provide services needed at recreation sites (such as firewood sales at campgrounds) and services that are commonly offered in conjunction with permitted special events. Criteria and/or stipulations to protect GSENM objects would be included in all permits.</p> <p><u>Outback and Primitive Areas:</u><br/>Vending would not be allowed.</p> | <p><b>Management Direction: VENDING</b><br/>Same as Alternative B.</p> | <p><b>Management Direction: VENDING</b><br/>No similar management direction.</p> | <p><b>Management Direction: VENDING</b><br/>Vending within the Monument will be occasional, infrequent, and may be allowed by permit on a case by-case basis in the front country and passage zones, in association with approved special events or recreation sites. Generally, permits could be issued to provide services needed at recreation sites (such as firewood sales at campgrounds) and services that are commonly offered in conjunction with permitted special events. Criteria and/or stipulations to protect Monument resources will be included in all permits. Concessionaire sales and ongoing vending permits are not included in this provision, except where contracts between concessionaires and the Monument are used to provide services to visitors in the front country and passage zones.</p> <p>Vending will not be allowed in the outback or primitive zones.</p> | <p><b>Management Direction: VENDING</b><br/><u>Front Country and Passage Areas:</u><br/>Vending would be allowed by permit on a case-by-case basis, in association with approved special events or recreation sites. Generally, permits could be issued to provide services needed at recreation sites (such as firewood sales at campgrounds) and services that are commonly offered in conjunction with permitted special events. Criteria and/or stipulations to protect GSENM objects would be included in all permits.</p> <p><u>Outback and Primitive Areas:</u><br/>Vending would not be allowed.</p> |

| Row No. | Alternative A   | Alternative B   | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan   | Alternative E Proposed 2024 RMP  |
|---------|---|---|---------------|---------------|---|---|--|
| -       | <b>TRAVEL AND TRANSPORTATION MANAGEMENT</b>   |   |               |               | <b>Not for analysis. For comparison only.</b>   |   | -  |
| 224.    | <p><b>Goal:</b><br/>Establish a transportation system that contributes to protection of sensitive resources (such as wildlife habitat, riparian areas, and cultural resources), accommodates a variety of uses, and minimizes user conflicts.</p> | <p><b>Goal:</b><br/>Provide appropriate access to GSENM while ensuring the protection, restoration, and/or increased resiliency of GSENM objects.</p> |               |               | <p><b>Goal:</b><br/>Establish a transportation system that contributes to protection of sensitive resources (such as wildlife habitat, riparian areas, and cultural resources), accommodates a variety of uses, and minimizes user conflicts. (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Goal:</b><br/>This Plan designates the route system for the Monument. The specific routes shown open for public use are based on a variety of considerations including what is needed to protect Monument resources, implement the planning decisions, and provide for the transportation needs of surrounding communities. The basic philosophy in determining which routes will be open was to determine which routes access some destination (such as scenic overlook, popular camping site, heavily used thoroughfare) and present no significant threat to Monument resources. These routes will be open for public use. Routes that were not considered necessary or desirable (for resource protection purposes) will not be kept open for motorized and mechanized public access. In the event that Title 5 ROWs are issued or in the event of legal decisions on R.S. 2477 assertions, routes will be governed under the terms of these actions.</p> | <p><b>Goal:</b><br/>Provide appropriate access to GSENM while ensuring the protection GSENM objects.</p> |



| Row No. | Alternative A   | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan                      | Alternative E Proposed 2024 RMP   |
|---------|---|--|---------------|---------------|---|--|---|
| -       | <b>TRAVEL AND TRANSPORTATION MANAGEMENT</b>   |  |               |               | <b>Not for analysis. For comparison only.</b>   |  | -   |
| 225.    | <p><b>Objective:</b><br/>Establish OHV management areas that guide the establishment of a transportation system that provides access to public land resources, provides connectivity to other lands and communities, and provides for experiences compatible with the protection of GSENM objects.</p> <p>Sustain compatible traditional, current, and future use of the land by establishing a route system that contributes to protection of sensitive resources, accommodates a variety of uses, and minimizes user conflicts.</p> <p>Consider public access, resource management, and regulatory needs through transportation planning, incorporating consideration of access needs and the effects of and interaction among all forms of travel, including OHV, mechanized, and nonmotorized/ mechanized travel.</p> | <p><b>Objective:</b><br/>Establish a transportation system that protects GSENM objects (such as wildlife habitat, riparian areas, and cultural resources), provides for appropriate access, and minimizes conflicts among various uses of GSENM.</p> |               |               | <p><b>Objective:</b><br/>Establish OHV management areas that guide the establishment of a transportation system that provides access to public land resources, provides connectivity to other lands and communities, and provides for experiences compatible with the BLM’s multiple-use mission. (GSENM ROD 2020, KEPA ROD 2020)</p> <p>Sustain compatible traditional, current, and future use of the land by establishing a route system that contributes to protection of sensitive resources, accommodates a variety of uses, and minimizes user conflicts. (GSENM ROD 2020, KEPA ROD 2020)</p> <p>Consider public access, resource management, and regulatory needs through transportation planning, incorporating consideration of access needs and the effects of and interaction among all forms of travel, including OHV, mechanized, and nonmotorized/mechanized travel. (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Objective:</b><br/>No similar objective.</p> | <p><b>Objective:</b><br/>Establish a transportation system that provides for appropriate access, protects GSENM objects and resources, provides for appropriate access, minimizes impacts on other resources, and minimizes user conflicts.</p> |

| Row No. | Alternative A   | Alternative B  | Alternative C   | Alternative D  | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan   | Alternative E Proposed 2024 RMP  |
|---------|---|--|---|--|---|---|--|
| -       | <b>TRAVEL AND TRANSPORTATION MANAGEMENT</b>   |  |   |  | <b>Not for analysis. For comparison only.</b>   |   | -  |
| 226.    | <p><b>Management Direction:</b><br/>Any land acquired by the BLM over the life of the RMPs will be managed similarly to the existing OHV area designations of adjoining BLM-managed lands or as stated, or implied, in the transfer. Where clarification is absent, the BLM will manage acquired lands under the OHV limited area designation. The type of limitation will be set by implementation-level decisions; until these decisions are made, use may continue in the same manner and degree consistent with the purposes for which the acquisition was made.</p>  |  |   |  | <p><b>Management Direction:</b><br/>Any land acquired by the BLM over the life of the RMPs will be managed similarly to the existing OHV area designations of adjoining BLM lands or as stated, or implied, in the transfer. Where clarification is absent, the BLM will manage acquired lands under the OHV limited area designation. The type of limitation will be set by implementation-level decisions; until these decisions are made, use may continue in the same manner and degree consistent with the purposes for which the acquisition was made. (GSENM ROD 2020, KEPA ROD 2020)</p>  | <p><b>Management Direction:</b><br/>No similar Management Direction.</p>  | <p><b>Management Direction:</b><br/>Any land acquired by the BLM over the life of the RMP would be managed similarly to the existing OHV area designations of adjoining BLM-managed lands or as stated, or implied, in the transfer. Where clarification is absent, the BLM would manage acquired lands under the OHV limited area designation. The type of limitation would be set by implementation-level decisions; until these decisions are made, use may continue in the same manner and degree consistent with the purposes for which the acquisition was made.</p>                       |
| 227.    | <p><b>Management Direction:</b><br/>Until future travel management planning is complete, consistent with the OHV area designations made through this planning process, allow OHV use on routes identified in the GSENM MMP (BLM 2000), unless otherwise specifically addressed in the 2020 GSENM and KEPA Approved RMPs. While the GSENM MMP identified a route system for GSENM, route designation is an implementation-level decision that the BLM undertakes in a separate NEPA process.</p> <p><b>Future TMP Considerations:</b><br/>During the future travel management planning process, consider designation of OHV use and mechanical transport</p> | <p><b>Management Direction:</b><br/>Until new travel management planning is completed, the route designations in the 2000 MMP and as amended by the 2020 RMPs will apply.</p> <p>For routes designated for public use, future travel management planning (that is, designating routes as open, limited, or closed) will consider:</p> <ul style="list-style-type: none"> <li>• Motorized, mechanized, and nonmotorized/nonmechanized route designations.</li> <li>• Reduction of opportunities for motorized and mechanized travel in areas of highly erodible soils.</li> <li>• Reduction of opportunities for motorized travel near petroglyphs, pictographs, and inscriptions or other</li> </ul> | <p><b>Management Direction:</b><br/>Until new travel management planning is completed, the route designations in the 2000 MMP and as amended by the 2020 RMPs will apply, unless otherwise modified by this plan (allocation of OHV closed areas will result in the closure of the V-Road).</p> <p>For routes designated for public use, future travel management planning (that is, designating routes as open, limited, or closed) will consider:</p> <ul style="list-style-type: none"> <li>• Only designating OHV routes, beyond those included in the 2000 GSENM TMP, that would increase public safety and/or enhance protection of GSENM objects.</li> </ul> | <p><b>Management Direction:</b><br/>Until new travel management planning is completed, the route designations in the 2000 MMP will apply, unless otherwise modified by this plan (the closure of V-Road through allocation of OHV closed area, and Inchworm Arch Road through an implementation-level decision).</p> <p>For routes designated for public use, future travel management planning (that is, designating routes as open, limited, or closed) will:</p> <ul style="list-style-type: none"> <li>• Prohibit the designation of OHV routes not included in the 2000 GSENM TMP for public use, as modified by this planning process unless needed for public safety</li> </ul> | <p><b>Management Direction:</b><br/>Until future travel management planning is complete, consistent with OHV area designations made through this planning process, allow OHV use on routes identified in the GSENM MMP (BLM 2000), unless otherwise specifically addressed in the Final EIS. While the GSENM MMP identified a route system for the monument, route designation is an implementation-level decision that the BLM undertakes in a separate NEPA process.</p> <p><b>Future TMP Considerations:</b><br/>During the future travel management planning process, consider designation of OHV use and mechanical transport on primitive routes and ways</p> | <p><b>Management Direction:</b><br/>Base the specific routes shown open for public use on a variety of considerations, including what is needed to protect monument resources, implement the planning decisions, and provide for the transportation needs of surrounding communities. The basic philosophy in determining which routes will be open was to determine which routes access some destination (such as scenic overlook, popular camping site, heavily used thoroughfare) and present no significant threat to monument resources. Keep these routes open for public use. Close routes that were not considered necessary or desirable (for resource</p> | <p><b>Management Direction:</b><br/>The BLM would complete TMPs for motorized, mechanized, and nonmechanized and nonmotorized travel.</p> <p>Until new travel management planning for public OHV use is completed, the route designations in the 2000 MMP, as amended by the 2020 RMPs, would apply, unless otherwise modified by this plan (allocation of OHV closed areas would result in the closure of the V-Road).</p> <p>Any routes designated as available for public OHV use that are not designated for such use as of the date of this plan must protect and enhance GSENM objects</p> |

| Row No.         | Alternative A   | Alternative B   | Alternative C  | Alternative D   | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan  | Alternative E Proposed 2024 RMP   |
|-----------------|---|---|--|---|---|--|---|
| -               | <b>TRAVEL AND TRANSPORTATION MANAGEMENT</b>   |   |  |   | <b>Not for analysis. For comparison only.</b>   |  | -   |
| 227.<br>(cont.) | on primitive routes and ways that existed during the original wilderness inventory and were available for use immediately before the issuance of Presidential Proclamation 6920. The BLM will inventory linear transportation features in WSAs and compare them to the original wilderness inventory to determine whether any “new,” unauthorized routes are present. Any routes that were not present during the original inventory must be designated “OHV closed” (except in instances related to the provision of access to valid existing rights and limited to the right holder). | sensitive cultural sites to reduce impacts.<br><ul style="list-style-type: none"> <li>Avoidance of the development of nonmotorized trails near raptor nesting areas.</li> <li>Appropriate landing areas and landing strips for aircraft.</li> </ul> | <ul style="list-style-type: none"> <li>Motorized, mechanized, and nonmotorized/nonmechanized route designations.</li> <li>Reduction of opportunities for motorized and mechanized travel in areas of highly erodible soils.</li> <li>Reduction of opportunities for motorized travel near petroglyphs, pictographs, and inscriptions or other sensitive cultural sites to reduce impacts.</li> <li>Avoidance of the development of nonmotorized trails near raptor nesting areas.</li> <li>Appropriate landing areas and landing strips for aircraft.</li> </ul> | and/or enhance the protection of GSENM objects.<br><ul style="list-style-type: none"> <li>Consider motorized, mechanized, and nonmotorized/nonmechanized route designations.</li> <li>Eliminate motorized and mechanized travel in areas of highly erodible soils.</li> <li>Reduce opportunities for motorized travel near petroglyphs, pictographs, and inscriptions or other sensitive cultural sites.</li> <li>Reduce opportunities for motorized travel if there is or may be adverse effects on historic properties from OHV use, except for routes that would be allowed to remain open with appropriate mitigation.</li> <li>Close routes if there is or may be adverse effects on tribal sacred sites from OHV use, except for routes that would be allowed to remain open with appropriate mitigation.</li> <li>Close routes if they do not protect GSENM objects, except for routes that would be allowed to remain open with appropriate mitigation.</li> <li>Avoid the development of biking trails near raptor nesting areas.</li> </ul> | that existed during the original wilderness inventory and were available for use immediately before the issuance of Presidential Proclamation 6920. The BLM will inventory linear transportation features in WSAs and compare them to the original wilderness inventory to determine whether any “new,” unauthorized routes are present. Any routes that were not present during the original inventory must be designated “OHV closed” (except in instances related to provision of access to valid existing rights and limited to the right holder).<br>(GSENM ROD 2020, KEPA ROD 2020) | protection purposes) to OHV and mechanized public access.                        | and/or increase public safety. If a route is proposed for public OHV use for reasons of health and safety, the proposal must demonstrate that there is no other feasible way to address public health and safety. |
| 228.            | <b>Action (Implementation):</b><br>No similar management direction (Inchworm Arch Road is open to motorized travel).  |   |  | <b>Action (Implementation):</b><br>Close Inchworm Arch Road to motorized travel.  | <b>Action (Implementation):</b><br>No similar management direction (Inchworm Arch Road is open to motorized travel).  | <b>Action (Implementation):</b><br>Close Inchworm Arch Road to motorized travel. | <b>Action (Implementation):</b><br>No similar management direction.   |

| Row No. | Alternative A   | Alternative B   | Alternative C   | Alternative D   | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan  | Alternative E Proposed 2024 RMP  |
|---------|---|---|---|---|---|--|--|
| -       | <b>TRAVEL AND TRANSPORTATION MANAGEMENT</b>   |   |   |   | <b>Not for analysis. For comparison only.</b>   |  | -  |
| 229.    | <p><b>Management Direction:</b><br/>Delineate the planning area into the following travel management areas:</p> <ul style="list-style-type: none"> <li>• Garfield County                             <ul style="list-style-type: none"> <li>○ Hole-in-the-Rock Road</li> <li>○ Circle Cliffs</li> </ul> </li> <li>• Kane County</li> <li>• Kaiparowits</li> <li>• Escalante Canyons</li> <li>• Grand Staircase</li> </ul> <p>Adjustments to travel management area boundaries may be made prior to conducting implementation travel planning.</p> | <p><b>Management Direction:</b><br/>Delineate the planning area into the following travel management areas:</p> <ul style="list-style-type: none"> <li>• Kaiparowits</li> <li>• Escalante Canyons</li> <li>• Grand Staircase</li> </ul> <p>Adjustments to travel management area boundaries may be made prior to conducting travel management planning.</p> |   |   | <p><b>Management Direction:</b><br/>Delineate the planning area into the following travel management areas:</p> <ul style="list-style-type: none"> <li>• Garfield County                             <ul style="list-style-type: none"> <li>○ Hole-in-the-Rock Road</li> <li>○ Circle Cliffs</li> </ul> </li> <li>• Kane County</li> <li>• Kaiparowits</li> <li>• Escalante Canyons</li> <li>• Grand Staircase</li> </ul> <p>Adjustments to travel management area boundaries may be made prior to conducting implementation travel planning. (KEPA ROD 2020, GSENM ROD 2020)</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p>   | <p><b>Management Direction:</b><br/>Delineate the planning area into the following travel management areas:</p> <ul style="list-style-type: none"> <li>• Kaiparowits</li> <li>• Escalante Canyons</li> <li>• Grand Staircase</li> </ul> <p>Adjustments to travel management area boundaries may be made prior to conducting travel management planning.</p>  |
| 230.    | <p><b>Management Direction:</b><br/>Manage OHV use as follows:</p> <ul style="list-style-type: none"> <li>• Open: 100 acres                             <ul style="list-style-type: none"> <li>○ Little Desert RMZ</li> </ul> </li> <li>• Limited: 1,864,000 acres</li> <li>• Closed: 1,500 acres                             <ul style="list-style-type: none"> <li>○ No Mans Mesa RNA (ACEC)</li> </ul> </li> </ul>   | <p><b>Management Direction:</b><br/>Manage OHV use as follows:</p> <ul style="list-style-type: none"> <li>• Open: 0 acres</li> <li>• Limited: 913,600 acres</li> <li>• Closed: 952,000 acres</li> </ul>   | <p><b>Management Direction:</b><br/>Manage OHV use as follows:</p> <ul style="list-style-type: none"> <li>• Open: 0 acres</li> <li>• Limited: 656,200 acres</li> <li>• Closed: 1,209,400 acres</li> </ul> | <p><b>Management Direction:</b><br/>Manage OHV use as follows:</p> <ul style="list-style-type: none"> <li>• Open: 0 acres</li> <li>• Limited: 427,700 acres</li> <li>• Closed: 1,437,900 acres</li> </ul> | <p><b>Management Direction:</b><br/>Manage OHV use in GSENM as follows:</p> <ul style="list-style-type: none"> <li>• Open: 116 acres                             <ul style="list-style-type: none"> <li>○ Little Desert RMZ</li> </ul> </li> <li>• Limited: 1,860,300 acres</li> <li>• Closed: 2,800 acres                             <ul style="list-style-type: none"> <li>○ No Mans Mesa RNA (ACEC)</li> </ul> </li> </ul> <p>(KEPA ROD 2020; GSENM ROD 2020)</p>   | <p><b>Management Direction:</b><br/>Cross-country motorized travel will be prohibited in accordance with 43 CFR 8340 OHV regulations. Use on designated routes is allowed. OHV designations will be either “closed” (in the primitive zone) or “limited to designated routes” (in the front country, passage, and outback zones) (Map 79). These designations are consistent with standard BLM designations provided for in BLM Manual 8340. Vehicles may pull off routes no more than 50 feet for parking and camping in the outback zone, except where prohibited (see the Camping and Forestry Products section for related decisions). No OHV play areas will be designated in the Monument (MMP 2000).</p> <ul style="list-style-type: none"> <li>• Open: 0 acres</li> <li>• Limited: 655,408 acres</li> <li>• Closed: 1,210,137 acres</li> </ul> | <p><b>Management Direction:</b><br/>Manage OHV use as follows:</p> <ul style="list-style-type: none"> <li>• Open: 0 acres</li> <li>• Limited: 620,000 acres                             <ul style="list-style-type: none"> <li>○ Front country, passage, and outback areas</li> </ul> </li> <li>• Closed: 1,245,600 acres                             <ul style="list-style-type: none"> <li>○ Primitive area</li> </ul> </li> </ul> |

| Row No. | Alternative A  | Alternative B  | Alternative C  | Alternative D  | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan   | Alternative E Proposed 2024 RMP   |
|---------|--|--|--|--|--|---|---|
| -       | <b>TRAVEL AND TRANSPORTATION MANAGEMENT</b>  |  |  |  | <b>Not for analysis. For comparison only.</b>  |   | -   |
| 231.    | <b>Management Direction:</b><br>Limit mechanized travel and equipment to routes designated specifically for such use and routes where OHV use is allowed.            |  |  |  | <b>Management Direction:</b><br>Limit mechanized travel and equipment to routes designated specifically for such use and routes where OHV use is allowed. (GSENM ROD 2020, KEPA ROD 2020)            | <b>Management Direction:</b><br>Limit use of bicycles to designated routes and prohibit cross-country travel. | <b>Management Direction:</b><br>Limit mechanized travel to routes designated for public OHV use and/or routes designated specifically for such use.   |
| 232.    | <b>Management Direction:</b><br>Allow development and maintenance of trails for public safety and protection of resources, or to provide opportunities for visitors. | <b>Management Direction:</b><br>Consider designating nonmotorized recreational trails (such as hiking and horseback riding) in OHV limited and OHV closed areas. | <b>Management Direction:</b><br>Consider designating nonmotorized recreational trails (such as hiking and horseback riding) in OHV limited and OHV closed areas, according to the following parameters:<br><br><u>Front Country Area:</u><br>Allow a full range of recreational trails, including paved and nonpaved trails.<br><br><u>Passage Area:</u><br>Allow a range of recreational trails, including only nonpaved trails.<br><br><u>Outback Area:</u><br>Allow nonmotorized recreational trails.<br><br><u>Primitive Area:</u><br>Allow nonmechanized recreation trails only for resource protection and/or public safety. | <b>Management Direction:</b><br>Consider designating nonmotorized recreational trails (such as hiking and horseback riding) in OHV limited areas.<br><br>Prohibit designating new nonmotorized recreational trails (such as hiking and horseback riding) in OHV closed areas, unless necessary to enhance protection of GSENM objects. | <b>Management Direction:</b><br>Allow development and maintenance of trails for public safety and protection of resources, or to provide opportunities for visitors. (KEPA ROD 2020, GSENM ROD 2020) | <b>Management Direction:</b><br>Allow development and maintenance of trails per zone system.                  | <b>Management Direction:</b><br>Consistent with the protection of GSENM objects, designate nonmotorized recreational trails (such as hiking, biking, and horseback riding) in OHV limited and OHV closed areas, according to the following parameters:<br><br><u>Front Country Area:</u><br>Allow a full range of recreational trails, including paved and nonpaved trails.<br><br><u>Passage and Outback Areas:</u><br>Allow a range of recreational trails, including only nonpaved trails.<br><br><u>Primitive Area:</u><br>Allow nonpaved, nonmechanized recreation trails only for resource protection and/or public safety. |

| Row No. | Alternative A   | Alternative B   | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E Proposed 2024 RMP  |
|---------|---|---|---------------|---------------|--|--|--|
| -       | <b>TRAVEL AND TRANSPORTATION MANAGEMENT</b>   |   |               |               | Not for analysis. For comparison only.   |  | -  |
| 233.    | <p><b>Management Direction:</b> Repair, maintain, rehabilitate, and improve routes in accordance with the existing GSENM TMP (BLM 2000) until new TMPs are completed.</p> | <p><b>Management Direction:</b></p> <p><b>Maintenance:</b> Designated routes could be maintained to meet public health and safety needs and/or to protect GSENM objects. Deviations from current route maintenance levels on designated routes, to provide for public health and safety needs and/or to protect GSENM objects, would be considered during plan implementation on a case-by-case basis.</p> <p><b>Improvements:</b> Improvements to routes, including potential reroutes or alternative alignments, to provide for public health and safety needs and/or to protect GSENM objects. Would be considered during plan implementation on a case-by-case basis, in accordance with agency policy. For purposes of this management action, an “improvement” goes beyond preserving the status quo of the road or trail and includes the widening of the road or trail, the horizontal or vertical alignment of the road or trail, the installation of (as distinguished from cleaning, repair, or replacement in kind of already existing) bridges, culverts, and other drainage structures, as well as any significant changes in the surface composition of the road or trail.</p> |               |               | <p><b>Management Direction:</b> Repair, maintain, rehabilitate, and improve routes in accordance with the existing GSENM TMP (BLM 2000), until new TMPs are completed. (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Management Direction:</b> With the exception of those segments listed below, maintain open routes within the disturbed travel surface area as of the date of this plan; prohibit widening, passing lanes, or other travel surface upgrades. Allow deviations from the current maintenance levels as follows:</p> <ul style="list-style-type: none"> <li>• Hole-in-the-Rock Road: Allow stabilization of washout-prone areas, primarily along the southeastern end, to prevent erosion and sediment loading in drainages.</li> <li>• Smoky Mountain Road: Allow stabilization in the Alvey Wash section to prevent erosion and sediment loading in drainages.</li> <li>• Cottonwood Wash Road: Allow stabilization of washout-prone areas, primarily along the southern section, to prevent erosion and sediment loading in drainages.</li> <li>• Skutumpah Road: Allow new crossing for safety at Bull Valley Gorge, and stabilization of washout-prone areas, primarily along the northern section, to prevent erosion and sediment loading in drainages (MMP 2000).</li> </ul> | <p><b>Management Direction:</b></p> <p><b>Maintenance:</b> Designated routes could be maintained to meet public health and safety needs and/or to protect GSENM objects and resources. Deviations from current route maintenance levels on designated routes, to provide for public health and safety needs and/or to protect GSENM objects, would be considered on a case-by-case basis.</p> <p><b>Improvements:</b> Improvements to routes, including, but not limited to, Hole-in-the-Rock Road, Cottonwood Road, and House Rock Valley Road, to provide for public health and safety needs and/or to protect GSENM objects would be considered during plan implementation on a case-by-case basis, in accordance with applicable laws, regulations, and policy. The BLM’s consideration of any proposed improvement would include an opportunity for public participation prior to the issuance of a final decision. For purposes of this management action, an “improvement” goes beyond preserving the status quo of the road or trail and includes the widening of the road or trail; the horizontal or vertical alignment of the road or trail; the installation of (as distinguished from cleaning,</p> |

| Row No.         | Alternative A  | Alternative B   | Alternative C  | Alternative D  | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan                                    | Alternative E Proposed 2024 RMP  |
|-----------------|--|---|--|--|--|--|--|
| -               | <b>TRAVEL AND TRANSPORTATION MANAGEMENT</b>                      |   |  |  | <b>Not for analysis. For comparison only.</b>                    |  | -  |
| 233.<br>(cont.) | (see above)  | (see above)   |  |  | (see above)  | (see above)  | repair, or replacement in kind of already existing) bridges, culverts, and other drainage structures; and any significant changes in the surface composition of the road or trail.   |
| 234.            | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>As necessary to provide safe passage through GSENM on Hole-in-the-Rock Road, Cottonwood Road, and House Rock Valley Road, RMP implementation decisions will allow necessary improvements that are consistent with the protection of GSENM objects.  |  |  | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>No similar management direction.   |
| 235.            | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Motorized aircraft include but are not limited to, fixed-wing aircraft, helicopters, powered paragliders, electric aircraft, and unmanned aircraft systems (often referred to as UAS or drones).<br><br>The landings and takeoffs of motorized aircraft in GSENM would be managed as follows:<br><ul style="list-style-type: none"> <li>Public use of GSENM for landings and takeoffs of motorized aircraft would only be allowed on routes designated in a manner that allows such use in a <a href="#">TMP</a>. Subject to the following bullet, landings and takeoffs of motorized aircraft would be prohibited elsewhere within GSENM, including within 300 feet of developed recreation sites and areas.</li> <li>The agency may authorize case-by-case landings/takeoffs of motorized aircraft through formal permitting processes, where the use is beneficial to protecting GSENM objects.</li> </ul> | <b>Management Direction:</b><br><u>Front Country and Passage Areas:</u><br>Same as Alternative B.<br><br><u>Outback and Primitive Areas:</u><br>Same as Alternative D. | <b>Management Direction:</b><br>Motorized aircraft, include but are not limited to, fixed-wing aircraft, helicopters, powered paragliders, electric aircraft, and unmanned aircraft systems (often referred to as UAS or drones).<br>The landings and takeoffs of motorized aircraft in GSENM would be managed as follows:<br><ul style="list-style-type: none"> <li>Public use of GSENM for motorized aircraft landings and takeoffs would be prohibited.</li> <li>The agency may authorize case-by-case landings and takeoffs of motorized aircraft through formal permitting processes, where the use is beneficial to protecting GSENM objects.</li> </ul> | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Motorized aircraft include but are not limited to, fixed-wing aircraft, helicopters, powered paragliders, electric aircraft, and unmanned aircraft systems (often referred to as UAS or drones).<br><u>All Areas:</u><br>The BLM may authorize case-by-case landings/takeoffs of motorized aircraft through either a formal permitting process where the use is beneficial to protecting GSENM objects or for emergency purposes.<br><br><u>Front Country, Passage, and Outback Areas:</u><br>The landings and takeoffs of motorized aircraft in GSENM would be managed as follows:<br><ul style="list-style-type: none"> <li>Until new travel management planning is completed, public use of the Boulder/New Home Bench Airstrip for landings and takeoffs of motorized aircraft would be allowed.</li> <li>Public use of any additional landing and takeoff areas for manned motorized aircraft would need to be</li> </ul> |

| Row No.         | Alternative A                               | Alternative B | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs                      | 2000 Monument Management Plan | Alternative E Proposed 2024 RMP   |
|-----------------|---|---------------|---------------|---------------|---|-------------------------------|---|
| -               | <b>TRAVEL AND TRANSPORTATION MANAGEMENT</b> |               |               |               | <b>Not for analysis. For comparison only.</b> |                               | -   |
| 235.<br>(cont.) | (see above)                                 | (see above)   | (see above)   | (see above)   | (see above)                                   | (see above)                   | <p>designated through an implementation-level decision and must protect and enhance GSENM objects and/or increase public safety.</p> <ul style="list-style-type: none"> <li>Public use of GSENM for landings and takeoffs of unmanned aircraft systems (drones) would be allowed on designated open or limited OHV routes, unless prohibited through subsequent travel management planning.</li> <li>Public use of GSENM for landings and takeoffs of motorized aircraft would be prohibited within 300 feet of developed recreation sites and areas.</li> </ul> <p><u>Primitive Area:</u><br/>The landings and takeoffs of motorized aircraft in GSENM would be managed as follows:</p> <p>Public use of GSENM for motorized aircraft landings and takeoffs would be prohibited.</p> |



| Row No. | Alternative A   | Alternative B   | Alternative C | Alternative D  | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP  |
|---------|---|---|---------------|--|---|--|--|
| -       | <b>LANDS AND REALTY</b>   |   |               |  | <b>Not for analysis. For comparison only.</b>   |  | -  |
| 236.    | <b>Goal:</b><br>Manage ROWs, land tenure adjustments, withdrawals, and use of BLM-managed surface lands to meet the needs of internal and external customers and to preserve important resource values. | <b>Goal:</b><br>Manage discretionary ROWs/land use authorizations to be consistent with the protection of GSENM objects.                              |               | <b>Goal:</b><br>Manage discretionary ROWs/land use authorizations to support the enhanced protection of GSENM objects. | <b>Goal:</b><br>Manage ROWs, land tenure adjustments, withdrawals, and use of BLM-administered surface lands to meet the needs of internal and external customers and to preserve important resource values. (GSENM ROD 2020, KEPA ROD 2020)        | <b>Goal:</b><br>The BLM will work with local communities and utility providers to identify short and long-term community needs for infrastructure which could affect Monument lands and resources.   | <b>Goal:</b><br>Manage discretionary ROWs/land use authorizations to be consistent with the protection of GSENM objects.   |
| 237.    | <b>Goal:</b><br>No similar goal.  | <b>Goal:</b><br>Consolidate land within GSENM into federal ownership to protect GSENM objects.  |               |  | <b>Goal:</b><br>No similar goal.  | <b>Goal:</b><br>No similar goal.   | <b>Goal:</b><br>Consolidate land within GSENM into federal ownership to protect GSENM objects and resources.   |
| 238.    | <b>Objective:</b><br>Disposal of lands within GSENM is not allowed per the Proclamation, except for possibly by exchange that furthers the protective purposes of GSENM.                                |   |               |  | <b>Objective:</b><br>Retain in public ownership public lands that enhance multiple-use management, allow access to public lands, contain sensitive or rare resources, or have significant Native American concerns. (GSENM ROD 2020, KEPA ROD 2020) | <b>Objective:</b><br>No similar objective.   | <b>Objective:</b><br>Disposal of lands within GSENM is not allowed per Proclamation 10286, except for possibly by exchange that furthers the protective purposes of GSENM. |
| 239.    | <b>Objective:</b><br>Acquire lands or interests in lands to complement existing resource values and uses.   | <b>Objective:</b><br>Enhance the protection of GSENM objects, resources, and processes by land exchange and land acquisition from willing landowners. |               |  | <b>Objective:</b><br>Acquire lands or interests in lands to complement existing resource values and uses. (GSENM ROD 2020, KEPA ROD 2020)   | <b>Objective:</b><br>The BLM will consider land exchanges and acquisitions so long as the current owner is a willing participant and so long as the action is in the public interest and is in accordance with other management goals and objectives of this Plan. | <b>Objective:</b><br>Enhance the protection of GSENM objects and resources by land exchange and land acquisition from willing landowners.                                  |
| 240.    | <b>Objective:</b><br>Utilize energy and utility corridors to focus placement of new major ROWs for energy, utility, and transportation systems.   | <b>Objective:</b><br>When possible, place new ROWs in locations that best protect GSENM objects.  |               |  | <b>Objective:</b><br>Utilize energy and utility corridors to focus placement of new major ROWs for energy, utility, and transportation systems. (GSENM ROD 2020, KEPA ROD 2020)   | <b>Objective:</b><br>No similar objective.   | <b>Objective:</b><br>When possible, place new ROWs in locations that best protect GSENM objects and resources.   |

| Row No. | Alternative A  | Alternative B                              | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP  |
|---------|--|--|---------------|---------------|---|--|--|
| -       | <b>LANDS AND REALTY</b>  |  |               |               | Not for analysis. For comparison only.  |  | -  |
| 241.    | <b>Objective:</b><br>Make public lands available for ROWs, permits, and leases. The suitability for these land actions would be judged on a case-by-case basis.  | <b>Objective:</b><br>No similar objective. |               |               | <b>Objective:</b><br>Make public lands available for ROWs, permits, and leases. The suitability for these land actions would be judged on a case-by-case basis. (GSENM ROD 2020, KEPA ROD 2020)   | <b>Objective:</b><br>No similar objective.   | <b>Objective:</b><br>No similar objective.   |
| 242.    | <b>Objective:</b><br>Work with nearby communities and other land management agencies to pursue management activities that cooperatively accomplish the objectives of each agency within the constraints of federal law.  | <b>Objective:</b><br>No similar objective. |               |               | <b>Objective:</b><br>Work with nearby communities and other land management agencies to pursue management activities that cooperatively accomplish the objectives of each agency within the constraints of federal law. (GSENM ROD 2020, KEPA ROD 2020) | <b>Objective:</b><br>Monument managers are committed to working with nearby communities and other land management agencies to pursue management activities which cooperatively accomplish the objectives of each agency within the constraints of federal law.   | <b>Objective:</b><br>No similar objective.   |
| 243.    | <b>Management Direction:</b><br>In accordance with Presidential Proclamation 10286, all lands within GSENM are withdrawn from all forms of entry, location, selection, sale, or other disposition under the public land laws, from location, entry, and patent under the mining laws, and from disposition under all laws relating to mineral and geothermal leasing, other than by exchange that furthers the protective purposes of GSENM. In addition, there are withdrawals that existed prior to the original establishment of GSENM, such as public water reserves, that remain in effect until revoked. |  |               |               | <b>Management Direction:</b><br>In accordance with Presidential Proclamation 6920, as modified by Presidential Proclamation 9682, all lands within GSENM will continue to be withdrawn from mineral entry. (GSENM ROD 2020)                             | <b>Management Direction:</b><br>The Proclamation establishing the Monument withdrew all federal lands and interests in lands within the Monument from entry, location, selection, sale, leasing, or other disposition (except for exchanges that further the protective purposes of the Monument) under the public land laws, including the mineral leasing and mining laws. Thus, no new federal mineral leases or prospecting permits may be issued, nor may new mining claims be located within the Monument. | <b>Management Direction:</b><br>In accordance with Presidential Proclamation 10286, all lands within GSENM are withdrawn from all forms of entry, location, selection, sale, or other disposition under the public land laws, from location, entry, and patent under the mining laws, and from disposition under all laws relating to mineral and geothermal leasing, other than by exchange that furthers the protective purposes of GSENM. In addition, there are withdrawals that existed prior to the original establishment of GSENM, such as public water reserves, that remain in effect until revoked. |

| Row No. | Alternative A  | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP   |
|---------|--|--|---------------|---------------|---|--|---|
| -       | <b>LANDS AND REALTY</b>  |  |               |               | <b>Not for analysis. For comparison only.</b>   |  | -   |
| 244.    | <b>Management Direction:</b><br>No similar management direction.   | <b>Management Direction:</b><br>Where there are valid and existing nonmineral authorizations, their uses will be allowed subject to the terms and conditions of the authorizing document. Where these uses conflict with the protection of GSENM objects, and where legally possible, nonmineral authorizations will be adjusted to eliminate or minimize adverse impacts. |               |               | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>There are situations, unrelated to minerals, in which the BLM has authorized some use of public land or has conveyed some limited interest in public land. The authorization may be valid, existing when the Monument was designated, and may convey some “right” or interest. Many ROWs, easements, and leases granted on public land are in this category. They vary from case-to-case, but the details of each one is specified in the authoring document. These authorizations, where they are valid and existed when the Monument was established, will be recognized in the Monument and their uses will be allowed subject to the terms and conditions of the authoring document. Where these uses conflict with the protection of Monument resources, and where legally possible, leases, permits, or easements will be adjusted to eliminate or minimize adverse impacts. | <b>Management Direction:</b><br>Where there are valid and existing nonmineral authorizations, their uses will be allowed subject to the terms and conditions of the authorizing document. Where these uses conflict with the protection of GSENM objects, and where legally possible, nonmineral authorizations would be adjusted to eliminate or minimize adverse impacts. |
| -       | <b>LAND TENURE</b>   |  |               |               | -   | -  | -   |
| 245.    | <b>Management Direction:</b><br>Retain habitat for listed threatened, endangered, and candidate species in federal ownership unless land tenure adjustments would result in a net increase of habitat or benefit the species and further the protective purposes of GSENM. All actions involving listed species, or their habitat require consultation with the USFWS. | <b>Management Direction:</b><br>No similar management direction (disposal of lands within GSENM is not allowed per the Proclamation, except for possibly by exchange that furthers the protective purposes of GSENM).  |               |               | <b>Management Direction:</b><br>Retain habitat for listed threatened, endangered, and candidate species in federal ownership unless land tenure adjustments would result in a net increase of habitat or benefit the species. All actions involving listed species, or their habitat require consultation with the USFWS. (KEPA ROD 2020) | <b>Management Direction:</b><br>No similar management direction.   | <b>Management Direction:</b><br>No similar management direction (disposal of lands within GSENM is not allowed per Proclamation 10286, except for possibly by exchange that furthers the protective purposes of GSENM).   |

| Row No. | Alternative A  | Alternative B   | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP   |
|---------|--|---|---------------|---------------|---|--|---|
| -       | <b>LANDS AND REALTY</b>  |   |               |               | Not for analysis. For comparison only.  |  | -   |
| 246.    | <p><b>Management Direction:</b><br/>Consider land exchanges and acquisitions so long as the current owner is a willing participant and so long as the action is in the public interest and it is in accordance with other management goals and objectives of this plan. In the case of land exchanges, the exchange must also further the protective purposes of GSENM. The action must also result in a net gain of objects within GSENM, such as wildlife habitat, cultural sites, riparian areas, live water, threatened or endangered species habitat, or areas key to the maintenance of productive ecosystems. Priority will be given to actions that meet one or more of the following criteria:</p> <ul style="list-style-type: none"> <li>• Ensures the accessibility of public lands in areas where access is needed and cannot otherwise be obtained.</li> <li>• Is essential to allow effective management of public lands.</li> <li>• Results in the acquisition of lands that serve a national priority as identified in National policy directives. All land exchanges and acquisitions will be subject to valid existing rights as determined by the BLM.</li> </ul> <p>When evaluating whether exchange or acquisition of a particular parcel is appropriate, the increase or decrease of public access for outdoor recreation—</p> | <p><b>Management Direction:</b><br/>Acquire private inholding lands or interests in lands, by exchange, purchase, or donation, from any willing seller identified within GSENM.</p> |               |               | <p><b>Management Direction:</b><br/>Consider land exchanges and acquisitions so long as the current owner is a willing participant and so long as the action is in the public interest and is in accordance with other management goals and objectives of this plan. The action must also result in a net gain of objects and values within GSENM, such as wildlife habitat, cultural sites, riparian areas, live water, threatened or endangered species habitat, or areas key to the maintenance of productive ecosystems. Priority will be given to actions that meet one or more of the following criteria:</p> <ul style="list-style-type: none"> <li>• Ensures the accessibility of public lands in areas where access is needed and cannot otherwise be obtained.</li> <li>• Is essential to allow effective management of public lands.</li> <li>• Results in the acquisition of lands that serve a national priority as identified in National policy directives. All land exchanges and acquisitions will be subject to valid existing rights as determined by the BLM.</li> </ul> <p>When evaluating whether exchange or acquisition of a particular parcel is appropriate, the increase or decrease of public access for outdoor recreation—including hunting and fishing—will be considered in accordance with Secretarial Order 3373 or current</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Consider acquisition of private lands or interests in lands, by exchange, purchase, or donation, from any willing seller identified within GSENM.</p> |

| Row No.         | Alternative A  | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP  |
|-----------------|--|--|---------------|---------------|---|---|--|
| -               | <b>LANDS AND REALTY</b>  |  |               |               | <b>Not for analysis. For comparison only.</b>   |   | -  |
| 246.<br>(cont.) | including hunting and fishing— will be considered in accordance with Secretarial Order 3373 or current directives.   | (see above)  |               |               | directives. (GSENM ROD 2020)  | (see above)   | (see above)  |
| 247.            | <p><b>Management Direction:</b><br/>To be considered for acquisition or exchange, lands must meet one or more of the following land tenure criteria. The adjustment:</p> <ol style="list-style-type: none"> <li>1. Is in the public interest and accommodates needs of state, local, or private entities, including needs for the economy, community growth, and expansion.</li> <li>2. Results in a net gain of important and manageable resource values on public lands, such as crucial wildlife habitat, cultural sites, high-value riparian areas, live water, threatened and endangered species habitat, or areas key to maintaining productive ecosystems.</li> <li>3. Ensures accessibility of public lands in areas where access is needed and cannot otherwise be obtained.</li> <li>4. Is essential to allow effective management of public lands in areas where consolidation of ownership is necessary to meet resource management objectives; and</li> <li>5. Results in acquisition of lands that serve a national priority as identified in national policy directives.</li> </ol> | <p><b>Management Direction:</b><br/>Pursue land acquisitions and exchanges that support this plan’s management goals and objectives and that would further GSENM’s protective purposes.</p> <p>If prioritization is needed (such as due to workload and/or funding), prioritize actions that:</p> <ul style="list-style-type: none"> <li>• Protect objects and at-risk resources,</li> <li>• Enhance management of GSENM objects,</li> <li>• Facilitate scientific discovery, or</li> <li>• Serve National policy directives.</li> </ul> |               |               | <p><b>Management Direction:</b><br/>To be considered for any form of land tenure adjustment (including but not limited to exchanges, Recreation and Public Purposes Act, acquisitions, etc. [except FLPMA 203 Sales]), public lands in the planning area must meet one or more of the following land tenure criteria. The adjustment:</p> <ol style="list-style-type: none"> <li>1. Is in the public interest and accommodates needs of State, local, or private entities, including needs for the economy, community growth, and expansion, and is in accordance with other land use goals, objectives, and RMP planning decisions.</li> <li>2. Results in a net gain of important and manageable resource values on public lands, such as crucial wildlife habitat, cultural sites, high-value recreation areas, high-quality riparian areas, live water, threatened and endangered species habitat, or areas key to maintaining productive ecosystems.</li> <li>3. Ensures accessibility of public lands in areas where access is needed and cannot otherwise be obtained.</li> <li>4. Is essential to allow effective management of public lands in areas where consolidation of ownership is necessary to</li> </ol> | <p><b>Management Direction:</b><br/>Consider land exchanges and acquisitions so long as the current owner is a willing participant and so long as the action is in the public interest and is in accordance with other management goals and objectives of this plan. The action must also result in a net gain of objects and values within GSENM, such as wildlife habitat, cultural sites, riparian areas, live water, threatened or endangered species habitat, or areas key to the maintenance of productive ecosystems. The action may also meet one or more of the following criteria:</p> <ul style="list-style-type: none"> <li>• Ensures the accessibility of public lands in areas where access is needed and cannot otherwise be obtained;</li> <li>• Is essential to allow effective management of public lands; and</li> <li>• Results in the acquisition of lands that serve a national priority as identified in National policy directives. All land exchanges and acquisitions will be subject to valid existing rights as determined by the BLM.</li> </ul> | <p><b>Management Direction:</b><br/>Pursue land acquisitions and exchanges that support this plan’s management goals and objectives and that would further the protective purposes of GSENM.</p> <p>If prioritization is needed (for example, due to workload and/or funding), prioritize actions that:</p> <ul style="list-style-type: none"> <li>• Protect objects and at-risk resources,</li> <li>• Enhance management of GSENM objects,</li> <li>• Facilitate scientific discovery, or</li> <li>• Serve National policy directives.</li> </ul> |

| Row No.        | Alternative A           | Alternative B | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan | Alternative E 2024 Proposed RMP |
|----------------|-------------------------|---------------|---------------|---------------|--|-------------------------------|---------------------------------|
| -              | <b>LANDS AND REALTY</b> |               |               |               | <b>Not for analysis. For comparison only.</b>  |                               | -                               |
| 247<br>(cont.) | (see above)             | (see above)   |               |               | <p>meet resource management objectives; and</p> <p>5. Results in acquisition of lands that serve a national priority as identified in national policy directives.</p> <p>All future land tenure adjustments will require a site-specific environmental analysis in accordance with NEPA when an actual land tenure adjustment action is proposed.</p> <p>All future land tenure adjustments must be in conformance with other goals and objectives in this plan, some of which could preclude land tenure adjustment.</p> <p>All land tenure adjustments will be subject to valid existing rights as determined by the authorized officer.</p> <p>Acquisitions will be managed in a manner consistent with adjacent or comparable public land within the planning area.</p> <p>When evaluating whether acquisition or exchange of a particular parcel is appropriate, the increase or decrease of public access for outdoor recreation—including hunting and fishing—will be considered in accordance with Secretarial Order 3373 or current directives. (KEPA ROD 2020)</p> | (see above)                   | (see above)                     |

| Row No. | Alternative A   | Alternative B  | Alternative C   | Alternative D   | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP  |
|---------|---|--|---|---|---|---|--|
| -       | <b>LANDS AND REALTY</b>   |  |   |   | Not for analysis. For comparison only.  |   | -  |
| -       | <i>ROWs AND ROW CORRIDORS</i>   |  |   |   | -   | -   | -  |
| 248.    | <p><b>Management Direction:</b><br/>Maintain 10,900 acres as designated ROW corridors in the planning area. This includes Section 368 corridor 68-116 and the congressionally designated utility corridor along U.S. Highway 89 in Kane County, which extends 240 feet north and 500 feet south of the highway centerline.</p> <p>Nothing in these plans will prevent the use of the congressionally designated utility corridor along U.S. Highway 89 in Kane County for its designated purpose.</p> | <p><b>Management Direction:</b><br/>Maintain 10,900 acres as designated ROW corridors. This includes the Section 368 corridor 68-116 and the congressionally designated utility corridor along U.S. Highway 89 (Public Law 105-355) in Kane County, which extends 240 feet north and 500 feet south of the highway centerline.</p>   |   | <p><b>Management Direction:</b><br/>Maintain 2,300 acres as designated ROW corridors. This includes the congressionally designated utility corridor along U.S. Highway 89 (Public Law 105-355) in Kane County, which extends 240 feet north and 500 feet south of the highway centerline. Undesignate Section 368 corridor 68-116 within GSENM and no longer focus placement of major ROWs in that corridor.</p>  | <p><b>Management Direction:</b><br/>Maintain 11,378 acres as designated ROW corridors in the Planning Area. This includes Section 368 corridor 68-116 and the congressionally designated utility corridor along U.S. Highway 89 in Kane County, which extends 240 feet north and 500 feet south of the highway centerline.</p> <p>Nothing in these plans will prevent the use of the congressionally designated utility corridor along U.S. Highway 89 in Kane County for its designated purpose. (KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>Per Public Law 105-355, signed by President Clinton on October 31, 1998, a utility corridor was designated along U.S. Highway 89 in Kane County, including that portion of U.S. Highway 89 within the Monument. The utility corridor extends 240 feet north from the center line of the highway, and 500 feet south from the center line of the highway. Location of the proposed Lake Powell to Sand Hollow water pipeline within this utility corridor is a possibility. Subsequent NEPA analysis will be required.</p> | <p><b>Management Direction:</b><br/>Maintain 10,900 acres as designated ROW corridors. This includes the Section 368 corridor 68-116 and the congressionally designated utility corridor along U.S. Highway 89 (Public Law 105-355) in Kane County, which extends 240 feet north and 500 feet south of the highway centerline.</p>   |
| 249.    | <p><b>Allocation:</b><br/>Manage 881,300 acres as ROW exclusion areas (including communication sites).</p>  | <p><b>Allocation:</b><br/>Manage the following areas as ROW exclusion:</p> <ul style="list-style-type: none"> <li>• WSAs</li> <li>• Lands managed for protection of lands with wilderness characteristics</li> <li>• RNAs (ACECs)</li> <li>• ACECs</li> <li>• OSNHT National Trail Management Corridor</li> <li>• Suitable wild segments of WSR corridors</li> </ul> <p>The only exception to the ROW exclusion areas would be to consider, on a case-by-case basis, the granting of a ROW that would provide the minimum necessary function for local emergency services.</p> | <p><b>Allocation:</b><br/>Manage the following areas as ROW exclusion:</p> <ul style="list-style-type: none"> <li>• All areas identified in Alternative B</li> <li>• Primitive area</li> <li>• All suitable WSR corridors in the outback and primitive areas</li> </ul> | <p><b>Allocation:</b><br/>Manage the following areas as ROW exclusion:</p> <ul style="list-style-type: none"> <li>• All areas identified in Alternative B</li> <li>• High-probability cultural resource areas (according to BLM Class I Existing Information Inventory [Class I Inventory])</li> <li>• Highest probability for paleontological resources (PFYC 4 and 5)</li> <li>• Designated critical habitat</li> <li>• All suitable WSR corridors</li> </ul> | <p><b>Allocation:</b><br/>Manage 881,280 acres as ROW exclusion areas (including communication sites).</p>  | <p><b>Allocation:</b><br/>Prohibit utility ROWs in the primitive zone. In cases of extreme need for local (not regional) needs and where other alternatives are not available, a plan amendment could be considered for these facilities in the primitive zone. Communication sites will only be allowed in the primitive zone for safety purposes and where no other alternative exists.</p>   | <p><b>Allocation:</b><br/>Manage the following areas as ROW exclusion:</p> <ul style="list-style-type: none"> <li>• WSAs</li> <li>• Lands with wilderness characteristics managed for protection of those characteristics</li> <li>• RNAs (ACECs)</li> <li>• Suitable wild segments of WSR corridors</li> <li>• Primitive area</li> <li>• All suitable WSR corridors in the outback and primitive areas</li> </ul> <p>The only exception to the ROW exclusion areas would be to consider, on a case-by-case basis, the granting of a ROW that would provide the minimum necessary function for local emergency services.</p> |

| Row No. | Alternative A  | Alternative B   | Alternative C  | Alternative D   | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP   |
|---------|--|---|--|---|--|---|---|
| -       | <b>LANDS AND REALTY</b>  |   |  |   | <b>Not for analysis. For comparison only.</b>  |   | -   |
| 250.    | <p><b>Allocation:</b><br/>Manage 332,800 acres areas as ROW avoidance areas (including communication sites).</p> | <p><b>Allocation:</b><br/>Manage the following areas as ROW avoidance:</p> <ul style="list-style-type: none"> <li>• High-probability cultural resource areas</li> <li>• Priority Habitat Management Area (linear and site-type ROWs) (operative Greater Sage-grouse RMP amendment(s))</li> <li>• Greater sage-grouse opportunity areas within 4 miles of a lek located in Priority Habitat Management Area (operative Greater Sage-grouse RMP amendment(s))</li> </ul> <p>All other areas of GSENM are not identified as ROW exclusion or open.</p> <p>To allow a ROW in an avoidance area, the ROW must be the minimum necessary to achieve the ROW's purpose and would not otherwise be feasible in an open area.</p> | <p><b>Allocation:</b><br/>Manage the following areas as ROW avoidance:</p> <ul style="list-style-type: none"> <li>• High-probability cultural resource areas</li> <li>• Priority Habitat Management Area (linear and site-type ROWs) (operative Greater Sage-grouse RMP amendment(s))</li> <li>• Greater sage-grouse opportunity areas within 4 miles of a lek located in Priority Habitat Management Area (operative Greater Sage-grouse RMP amendment(s))</li> <li>• Front country, passage, and outback areas not identified as ROW exclusion or open.</li> </ul> <p>To allow a ROW in an avoidance area, the ROW must be the minimum necessary to achieve the ROW's purpose and would not otherwise be feasible in an open area.</p> | <p><b>Allocation:</b><br/>Manage the following areas as ROW avoidance:</p> <ul style="list-style-type: none"> <li>• Priority Habitat Management Area (linear and site-type ROWs) (operative Greater Sage-grouse RMP amendment(s))</li> <li>• Greater sage-grouse opportunity areas within 4 miles of a lek located in Priority Habitat Management Area (operative Greater Sage-grouse RMP amendment(s))</li> </ul> <p>All other areas of GSENM are not identified as ROW exclusion or open.</p> <p>To allow a ROW in an avoidance area, the ROW must be compatible, enhance the protection of GSENM objects, and would not otherwise be feasible in an open area.</p> | <p><b>Allocation:</b><br/>Manage 354,084 acres areas as ROW avoidance areas (including communication sites).</p> | <p><b>Allocation:</b><br/>Allow communication sites and utility ROWs in the outback zone within the constraints of the zone, where no other reasonable location exists, and will meet the visual objectives (see the Visual Resources, Night Skies, and Natural Soundscapes section for related decisions).</p> | <p><b>Allocation:</b><br/>Manage the following areas as ROW avoidance:</p> <ul style="list-style-type: none"> <li>• High-probability cultural resource areas as defined by predictive model values of 0.6 or greater (Cultural Resources Predictive Model for GSENM, Yaworsky et al. 2018)</li> <li>• Priority Habitat Management Area (linear and site-type ROWs) (operative Greater Sage-grouse RMP amendment(s))</li> <li>• Greater sage-grouse opportunity areas within 4 miles of a lek located in Priority Habitat Management Area (operative Greater Sage-grouse RMP amendment(s))</li> <li>• Front country, passage, and outback areas not identified as ROW exclusion or open</li> <li>• OSNHT Management Corridor, except as provided in row 248 and 275</li> </ul> <p>To allow a ROW in an avoidance area, the ROW must be the minimum necessary to achieve the ROW's purpose and would not otherwise be feasible in an open area.</p> |



| Row No. | Alternative A   | Alternative B  | Alternative C  | Alternative D   | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP  |
|---------|---|--|--|---|---|---|--|
| -       | <b>LANDS AND REALTY</b>   |  |  |   | Not for analysis. For comparison only.  |   | -  |
| 251.    | <b>Management Direction:</b><br>Manage 21,100 acres as ROW seasonal avoidance areas for the seasonal mule deer migration corridor along Highway 89. | <b>Management Direction:</b><br>Manage ROWs that have a common boundary with the Highway 89 fenced UDOT ROW as a seasonal avoidance area within the seasonal mule deer migration corridor (October 1 to April 30). No new ROW construction or maintenance would occur within this area during this time frame. |  |   | <b>Management Direction:</b><br>Manage 21,112 acres as ROW seasonal avoidance areas for the seasonal mule deer migration corridor along Highway 89. (KEPA ROD 2020) | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>Manage the Highway 89 seasonal mule deer migration corridor as a seasonal ROW avoidance area (October 1 to April 1). Prohibit new ROW construction or maintenance within this area during this time frame. Exceptions for emergency ROW maintenance could be considered on a case-by-case basis.   |
| 252.    | <b>Allocation:</b><br>Manage 651,500 acres as ROW open areas (including communication sites).   | <b>Allocation:</b><br>Manage the following areas as open for ROW location:<br>• Areas with existing utility ROWs<br>• Designated utility corridors   | <b>Allocation:</b><br>Manage the following areas as open for ROW location:<br>• Section 368 corridor 68-116<br>• Congressionally designated utility corridor along Highway 89 (Public Law 105-355) | <b>Allocation:</b><br>Manage the following areas as open for ROW location:<br>• Congressionally designated utility corridor along Highway 89 (Public Law 105-355) | <b>Allocation:</b><br>Manage 630,881 acres as ROW open areas (including communication sites). (GSENM ROD 2020; KEPA ROD 2020)                                       | <b>Allocation:</b><br>In the front country and passage zones, communication sites and utility ROWs will be allowed, but they will have to meet visual resource objectives (see the Visual Resource Management section for related decisions). | <b>Allocation:</b><br>Manage the following areas as open for ROW location:<br>• Section 368 corridor 68-116<br>• Congressionally designated utility corridor along Highway 89 (Public Law 105-355)   |
| 253.    | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>Allow renewal or upgrades of existing new facilities authorized under a ROW/land use authorization in GSENM.   |  |   | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>Allow renewal or upgrades of existing facilities authorized under a ROW/land use authorization in GSENM.<br><br>Upgrades of existing facilities must be consistent with the protection of GSENM objects.<br><br>In ROW exclusion areas other than WSAs, on a case-by-case basis, and consistent with the protection of GSENM objects, the BLM may authorize:<br>• Additional necessary access to an existing ROW for purposes of maintenance<br>• The widening of an existing ROW<br>• The replacement of existing ROW facilities with new adjacent ROW facilities |

| Row No. | Alternative A   | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP   |
|---------|---|--|---------------|---------------|---|--|---|
| -       | <b>LANDS AND REALTY</b>   |  |               |               | <b>Not for analysis. For comparison only.</b>   |  | -   |
| 254.    | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>Applicants must clearly demonstrate that no feasible off-GSENM alternatives exist for placement of facilities prior to analyzing placement within GSENM, except in designated utility corridors. |               |               | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>No similar management direction.   | <b>Management Direction:</b><br>Applicants must clearly demonstrate that no feasible off-GSENM alternatives exist for placement of facilities, which includes both new facilities and the replacement of existing facilities with new adjacent facilities, prior to analyzing placement within GSENM, except in designated utility corridors. |
| 255.    | <b>Management Direction:</b><br>Authorize only one access route to private land parcels unless public safety or local ordinances warrant additional routes. Private landowners must coordinate the development of access routes across public lands to prevent a proliferation of routes. | <b>Management Direction:</b><br>Authorize only one reasonable access route to private land parcels unless public safety warrants additional routes.  |               |               | <b>Management Direction:</b><br>Authorize only one access route to private land parcels unless public safety or local ordinances warrant additional routes. Private landowners must coordinate the development of access routes across public lands in order to prevent a proliferation of routes. (GSENM ROD 2020) | <b>Management Direction:</b><br>The BLM will authorize only one access route to private land parcels unless public safety or local ordinances warrant additional routes. Private landowners will be required to coordinate the development of access routes across public lands in order to prevent a proliferation of routes. ROWs may be allowed when necessary to exercise valid existing rights. | <b>Management Direction:</b><br>Authorize only one reasonable access route to private land parcels unless public safety warrants additional routes.   |

| Row No. | Alternative A   | Alternative B   | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP   |
|---------|---|---|---------------|---------------|--|--|---|
| -       | <b>LANDS AND REALTY</b>   |   |               |               | <b>Not for analysis. For comparison only.</b>  |  | -   |
| 256.    | <p><b>Management Direction:</b><br/>           Authorize communication site facilities in areas open to new ROWs.</p> | <p><b>Management Direction:</b><br/>           No similar management direction (follow avoidance/exclusion/open allocations above).</p> |               |               | <p><b>Management Direction:</b><br/>           Authorize communication site facilities in areas open to new ROWs. (GSENM ROD 2020)</p> | <p><b>Management Direction:</b><br/>           In the front country and passage zones, communication sites and utility ROWs will be allowed, but will have to meet visual resource objectives (see the Visual Resource Management section for related decisions).<br/><br/>           In the outback zone, communication sites and utility ROWs will be allowed within the constraints of the zone, where no other reasonable location exists, and will meet the visual objectives (see the Visual Resource Management section for related decisions).<br/><br/>           In the primitive zone, utility ROWs will not be permitted. In cases of extreme need for local (not regional) needs and where other alternatives are not available, a plan amendment could be considered for these facilities in the primitive zone. Communication sites will only be allowed in the primitive zone for safety purposes and where no other alternative exists.</p> | <p><b>Management Direction:</b><br/>           No similar management direction.</p> |

| Row No. | Alternative A   | Alternative B   | Alternative C | Alternative D   | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan                                    | Alternative E 2024 Proposed RMP  |
|---------|---|---|---------------|---|---|--|--|
| -       | <b>RENEWABLE ENERGY</b>   |   |               |   | <b>Not for analysis. For comparison only.</b>   |  | -  |
| 257.    | <b>Goal:</b><br>Manage and provide opportunities for solar, wind, geothermal, and other renewable energy uses consistent with the protection of GSENM objects and in consideration of goals, objectives, and management of other resources. | <b>Goal:</b><br>Identify and provide opportunities for small-scale renewable energy sources for the purposes of powering facilities in GSENM.   |               |   | <b>Goal:</b><br>Manage and provide opportunities for solar, wind, geothermal, and other renewable energy uses in consideration of goals, objectives, and management of other resources. (GSENM ROD 2020, KEPA ROD 2020) | <b>Goal:</b><br>No similar goal.                                 | <b>Goal:</b><br>Identify and provide opportunities for small-scale renewable energy sources for the purposes of powering facilities in GSENM.  |
| 258.    | <b>Objective:</b><br>Identify renewable energy variance, avoidance, and exclusion areas.  | <b>Objective:</b><br>No similar objective.  |               |   | <b>Objective:</b><br>Identify renewable energy variance, avoidance, and exclusion areas. (GSENM ROD 2020, KEPA ROD 2020)  | <b>Objective:</b><br>No similar objective.                       | <b>Objective:</b><br>No similar objective.   |
| 259.    | <b>Objective:</b><br>Provide opportunities for renewable energy development where consistent with the protection of GSENM objects and compatible with other resources.  | <b>Objective:</b><br>Prioritize the use of renewable energy in existing facility upgrades and the construction of new renewable energy facilities where appropriate and compatible with protecting GSENM objects. |               | <b>Objective:</b><br>Prioritize the use of renewable energy in existing facility upgrades where appropriate and compatible with protecting GSENM objects. | <b>Objective:</b><br>Provide opportunities for renewable energy development where compatible with other resources. (GSENM ROD 2020, KEPA ROD 2020)  | <b>Objective:</b><br>No similar objective.                       | <b>Objective:</b><br>Prioritize the use of renewable energy in existing facility upgrades and the construction of new utility-scale renewable energy facilities where appropriate and if consistent with protecting GSENM objects. |
| 260.    | <b>Management Direction:</b><br>ROW avoidance and exclusion areas also apply to renewable energy development.   |   |               |   | <b>Management Direction:</b><br>ROW avoidance and exclusion areas also apply to renewable energy development. (GSENM ROD 2020, KEPA ROD 2020)   | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>ROW avoidance and exclusion areas also apply to renewable energy development.  |
| 261.    | <b>Management Direction:</b><br>Prohibit utility-scale renewable energy development in GSENM.   |   |               |   | <b>Management Direction:</b><br>In the former GSENM boundary: Prohibit (that is, exclude) utility-scale renewable energy development in GSENM. (GSENM ROD 2020)   | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Prohibit utility-scale renewable energy development in GSENM.  |

| Row No. | Alternative A   | Alternative B   | Alternative C | Alternative D                              | 2020 GSENM and KEPA RMPs                      | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP   |
|---------|---|---|---------------|--|---|---|---|
| -       | <b>AREAS OF CRITICAL ENVIRONMENTAL CONCERN AND RESEARCH NATURAL AREAS</b> |   |               |  | <b>Not for analysis. For comparison only.</b> |   | -   |
| 262.    | <b>Goal:</b><br>No similar goal.  | <b>Goal:</b><br>Protect intact ecosystems' components through designation of ACECs and RNAs (ACECs) that represent the diversity of landscapes and ecosystems across GSENM. |               | <b>Goal:</b><br>No similar goal.           | <b>Goal:</b><br>No similar goal.              | <b>Goal:</b><br>No similar goal.  | <b>Goal:</b><br>Protect, maintain, and/or restore resources with outstanding and more than locally significant qualities of special worth, consequence, distinctiveness, or concern, especially relative to similar resources, when there are circumstances that make them irreplaceable or vulnerable to present adverse change. |
| 263.    | <b>Objective:</b><br>No similar objective.                                | <b>Objective:</b><br>Manage ACECs and RNAs (ACECs) where relevance and importance criteria are met, and special management is required to protect GSENM objects.            |               | <b>Objective:</b><br>No similar objective. | <b>Objective:</b><br>No similar objective.    | <b>Objective:</b><br>No ACECs are designated in the 2000 MMP. After careful evaluation of the resources recognized in ACEC nominations, it was determined that their protection will be substantially equivalent under either Monument authority or ACEC designation. | <b>Objective:</b><br>Manage ACECs and RNAs (ACECs) where relevance and importance criteria are met, and special management is required to protect GSENM objects and/or resources.   |

| Row No. | Alternative A  | Alternative B  | Alternative C | Alternative D  | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP  |
|---------|--|--|---------------|--|--|--|--|
| -       | <b>AREAS OF CRITICAL ENVIRONMENTAL CONCERN AND RESEARCH NATURAL AREAS</b>  |  |               |  | Not for analysis. For comparison only.   |  | -  |
| 264.    | <p><b>Management Direction:</b><br/>No similar management direction.</p>   | <p><b>Management Direction:</b><br/>Designate Fiftymile Mountain RNA (ACEC) (54,800 acres) to protect cultural resources, water resources, and scientific opportunity. Apply the following management:</p> <p><i>Cultural Resources</i></p> <ul style="list-style-type: none"> <li>• Develop a cultural resources monitoring plan and coordinate with the grazing permittee to identify potential impacts from livestock grazing. The cultural resources monitoring plan would include adaptive management thresholds that indicate the appropriate level of grazing, including no grazing for the protection of cultural resources in the applicable allotment management plans.</li> <li>• Camping by permit only. Permits must be approved by the <a href="#">authorized officer</a>.</li> <li>• Facilitate scientific research.</li> <li>• ROW exclusion</li> </ul> <p><i>Water Resources</i></p> <ul style="list-style-type: none"> <li>• Conduct level 2 spring inventories and develop a water resources monitoring plan. The water resources monitoring plan would include adaptive management to protect and restore relevant and important water resources.</li> </ul> |               | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p>   | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Designate Fiftymile Mountain RNA (ACEC) (54,800 acres) to protect cultural resources, water resources, and scientific opportunity. Apply the following management:</p> <p><i>Cultural Resources</i></p> <ul style="list-style-type: none"> <li>• Develop a cultural resources monitoring plan and coordinate with the grazing permittee to identify potential impacts from livestock grazing. The cultural resources monitoring plan would include adaptive management thresholds that indicate the appropriate level of grazing, including no grazing for the protection of cultural resources in the applicable allotment management plans.</li> <li>• Camping by permit only.</li> <li>• Facilitate scientific research.</li> <li>• ROW exclusion</li> </ul> <p><i>Water Resources</i></p> <ul style="list-style-type: none"> <li>• Conduct level 2 spring inventories and develop a water resources monitoring plan. The water resources monitoring plan would include adaptive management to protect and restore relevant and important water resources.</li> </ul> |
| 265.    | <p><b>Management Direction:</b><br/>Manage No Mans Mesa RNA (ACEC) (1,464 acres) as follows (GSENM ROD 2020):</p> <ul style="list-style-type: none"> <li>• Unavailable for livestock grazing</li> <li>• Closed to motorized OHV use</li> <li>• Prohibit campfires</li> </ul> | <p><b>Management Direction:</b><br/>Designate No Mans Mesa RNA (ACEC) (1,464 acres) to protect vegetation resources and scientific opportunity. Apply the following management:</p> <p><i>Vegetation Resources</i></p> <ul style="list-style-type: none"> <li>• Prohibit firewood gathering</li> <li>• ROW exclusion</li> </ul>  |               | <p><b>Management Direction:</b><br/>Same as Alternative B.</p>           | <p><b>Management Direction:</b><br/>Manage No Mans Mesa RNA (ACEC) (1,464 acres) as follows (GSENM ROD 2020):</p> <ul style="list-style-type: none"> <li>• Unavailable for livestock grazing</li> <li>• Closed to motorized OHV use</li> <li>• Prohibit campfires</li> </ul> | <p><b>Management Direction:</b><br/>Same as Alternative A.</p>           | <p><b>Management Direction:</b><br/>Designate No Mans Mesa RNA (ACEC) (1,464 acres) to protect vegetation resources and scientific opportunity. Apply the following management:</p> <p><i>Vegetation Resources</i></p> <ul style="list-style-type: none"> <li>• Prohibit firewood gathering</li> <li>• ROW exclusion</li> </ul>  |

| Row No. | Alternative A  | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP                                    |
|---------|--|--|---------------|---------------|---|---|--|
| -       | <b>SPECIAL AREA DESIGNATIONS</b>   |  |               |               | Not for analysis. For comparison only.  |   | -  |
| 266.    | <p><b>Management Direction:</b><br/>The 2000 MMP and the 2020 RMP erroneously carried forward special area designations and continued a multiple-use classification and continued a multiple-use classification. However, a 1994 Federal Register notice (59 FR 107, 29205-29206) clarified that the regulations under which these areas were classified are obsolete. Therefore, these areas are not carried forward.</p> <ul style="list-style-type: none"> <li>• The Gulch (3,430 acres)</li> <li>• Escalante Canyons Tracts 1 and 5 (1,160 acres)</li> <li>• North Escalante Canyons Tracts 2, 3, and 4 (5,800 acres)</li> <li>• Phipps-Death Hollow (34,300 acres)</li> <li>• Devil's Garden (640 acres)</li> <li>• Wolverine Petrified Wood Area (1,520 acres)</li> <li>• Calf Creek Recreation Area (5,835 acres) (see Recreation for additional management)</li> <li>• Deer Creek Recreation Area (640 acres) (see Recreation for additional management)</li> <li>• Dance Hall Rock Historic Site (640 acres)</li> </ul> | <p><b>Management Direction:</b><br/>Do not designate any ONAs.</p> |               |               | <p><b>Management Direction:</b><br/>Other special area designations that existed prior to monument designation, and were retained after monument designation, include:</p> <ul style="list-style-type: none"> <li>• Calf Creek Recreation Area</li> <li>• Deer Creek Recreation Area</li> <li>• Devils Garden Outstanding Natural Area</li> <li>• Dance Hall Rock Historic Site</li> <li>• Escalante Canyons Outstanding Natural Area (tracts 2, 3, and 4 are included in the North Escalante Canyon/The Gulch ISA and tracts 1 and 5 are separate)</li> <li>• North Escalante Canyon Outstanding Natural Area</li> <li>• The Gulch Outstanding Natural Area</li> <li>• Phipps-Death Hollow Outstanding Natural Area</li> <li>• No Mans Mesa RNA (ACEC)</li> <li>• Wolverine Petrified Wood Natural Environmental Area</li> </ul> | <p><b>Management Direction:</b><br/>All existing special area designations are consistent with the Proclamation and the objectives of this Plan. The following designation will continue:</p> <ul style="list-style-type: none"> <li>• Calf Creek Recreation Area</li> <li>• Deer Creek Recreation Site</li> <li>• Devils Garden Outstanding Natural Area</li> <li>• Dance Hall Rock Historic Site</li> <li>• Escalante Canyons Outstanding Natural Area (tracts 2, 3, 4 are included in North Escalante Canyon/The Gulch ISA and Tract 1 and 5 are separate)</li> <li>• North Escalante Canyon Outstanding Natural Area</li> <li>• The Gulch Outstanding Natural Area</li> <li>• Phipps-Death Hollow Outstanding Natural Area</li> <li>• No Mans Mesa RNA (ACEC)</li> <li>• Wolverine Petrified Wood Natural Environmental Area</li> </ul> | <p><b>Management Direction:</b><br/>Do not designate any ONAs.</p> |

| Row No. | Alternative A   | Alternative B   | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan                         | Alternative E 2024 Proposed RMP   |
|---------|---|---|---------------|---------------|---|---|---|
| -       | <b>NATIONAL HISTORIC TRAILS</b>   |   |               |               | <b>Not for analysis. For comparison only.</b>   |   | -   |
| 267.    | <b>Goal:</b><br>Promote the preservation and appreciation of the OSNHT for the enjoyment of the American people.  | <b>Goal:</b><br>Promote the preservation and appreciation of the OSNHT.   |               |               | <b>Goal:</b><br>Promote the preservation and appreciation of the OSNHT for the enjoyment of the American people. (GSENM ROD 2020, KEPA ROD 2020)  | <b>Goal:</b><br>No similar management direction.      | <b>Goal:</b><br>Responsibly provide for recreation, preservation, and appreciation of the OSNHT, consistent with the protection of GSENM objects.   |
| 268.    | <b>Objective:</b><br>Identify and manage an appropriate trail management corridor for the OSNHT.  | <b>Objective:</b><br>No similar objective.  |               |               | <b>Objective:</b><br>Identify and manage an appropriate trail management corridor for the OSNHT. (GSENM ROD 2020, KEPA ROD 2020)  | <b>Objective:</b><br>No similar management direction. | <b>Objective:</b><br>Manage the OSNHT management corridor for appropriate recreational use and preservation of trail resources in accordance with the National Historic Trails Act and applicable BLM policy. |
| 269.    | <b>Objective:</b><br>Manage the landscape (viewshed) associated with the OSNHT so that visitors continue to get a sense of how this landscape influenced commercial trade along the trails. | <b>Objective:</b><br>Manage the OSNHT so that visitors continue to get a sense of how this landscape contributed to the use of the trail. |               |               | <b>Objective:</b><br>Manage the landscape (viewshed) associated with the OSNHT so that visitors continue to get a sense of how this landscape influenced commercial trade along the trails. (GSENM ROD 2020, KEPA ROD 2020) | <b>Objective:</b><br>No similar management direction. | <b>Objective:</b><br>Manage the OSNHT management corridor to preserve the historic integrity of the trail so that visitors can have a vicarious experience.   |
| 270.    | <b>Objective:</b><br>No similar objective.  | <b>Objective:</b><br>No similar objective.  |               |               | <b>Objective:</b><br>No similar objective.  | <b>Objective:</b><br>No similar objective.            | <b>Objective:</b><br>Identify, preserve, and protect significant cultural resources and significant history properties with the OSNHT Management Corridor that support the nature and purposes of the OSNHT.  |



| Row No. | Alternative A  | Alternative B   | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP  |
|---------|--|---|---------------|---------------|--|--|--|
| -       | <b>NATIONAL HISTORIC TRAILS</b>  |   |               |               | <b>Not for analysis. For comparison only.</b>  |  | -  |
| 271.    | <p><b>Management Direction:</b><br/>Establish an OSNHT National Trail Management Corridor along the Box of the Paria High-Potential Segment, to include lands up to 0.5 miles on either side of the OSNHT centerline or within the viewshed, whichever is less.</p> <p>Prohibit discretionary uses that would substantially interfere with the nature and purposes of the OSNHT.</p> | <p><b>Management Direction:</b><br/>Establish an OSNHT National Trail Management Corridor, as informed by the OSNHT inventory.</p> <p>Prohibit discretionary uses that would substantially interfere with the nature and purposes of the OSNHT.</p> |               |               | <p><b>Management Direction:</b><br/>Establish an OSNHT National Trail Management Corridor along the Box of the Paria High-Potential Segment, to include lands up to 0.5 miles on either side of the OSNHT centerline or within the viewshed, whichever is less. (GSENM ROD 2020, KEPA 2020)</p> <p>Manage the designated OSNHT National Trail Management Corridor as follows: Allow mineral leasing subject to controlled surface use stipulation. (KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Designate 78,600 acres as the OSNHT Management Corridor, as shown in Figure 3-22.</p>  |
| 272.    | <p><b>Management Direction:</b><br/>No similar management direction.</p>   | <p><b>Management Direction:</b><br/>No similar management direction.</p>  |               |               | <p><b>Management Direction:</b><br/>No similar management direction.</p>   | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Prohibit discretionary uses that would substantially interfere with the nature and purposes of the OSNHT within the management corridor.</p>   |
| 273.    | <p><b>Management Direction:</b><br/>No similar management direction.</p>   | <p><b>Management Direction:</b><br/>No similar management direction.</p>  |               |               | <p><b>Management Direction:</b><br/>No similar management direction.</p>   | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Provide appropriate facilities, interpretation, and signage for the OSNHT to improve visitor experiences.</p>  |
| 274.    | <p><b>Management Direction:</b><br/>No similar management direction.</p>   | <p><b>Management Direction:</b><br/>No similar management direction.</p>  |               |               | <p><b>Management Direction:</b><br/>No similar management direction.</p>   | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Prepare an Activity Plan for the OSNHT management corridor that identifies specific uses that are consistent with the goals and objectives for the corridor and includes a monitoring component.</p> |

| Row No. | Alternative A   | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP  |
|---------|---|--|---------------|---------------|---|--|--|
| -       | <b>NATIONAL HISTORIC TRAILS</b>   |  |               |               | <b>Not for analysis. For comparison only.</b>   |  | -  |
| 275.    | <p><b>Management Direction:</b><br/>Manage High-Potential Sites and Segments per the National Trails System Act as follows:</p> <ul style="list-style-type: none"> <li>• Allow discretionary uses that would be compatible with the protection of the purpose and nature, resources, qualities, values, and settings of the OSNHT.</li> </ul> | <p><b>Management Direction:</b><br/>Manage OSNHT as ROW exclusion.</p>   |               |               | <p><b>Management Direction:</b><br/>Manage High-Potential Sites and Segments per the National Trails System Act as follows:</p> <ul style="list-style-type: none"> <li>• Allow discretionary uses that would be compatible with the protection of the purpose and nature, resources, qualities, values, and settings of the OSNHT. (GSENM ROD 2020, KEPA ROD 2020)</li> </ul> | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Manage the OSNHT management corridor as ROW avoidance except:</p> <ul style="list-style-type: none"> <li>• Manage the portions of the corridor that fall within the primitive zone as ROW exclusion.</li> <li>• Manage the portions that fall within the congressionally designated utility corridor along U.S. Highway 89 (Public Law 105-355) as open to ROWs.</li> </ul>        |
| 276.    | <p><b>Management Direction:</b><br/>No similar management direction.</p>  | <p><b>Management Direction:</b><br/>No similar management direction.</p> |               |               | <p><b>Management Direction:</b><br/>No similar management direction.</p>  | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Manage the OSNHT management corridor to protect the integrity of the historic setting by managing as VRM Class II except:</p> <ul style="list-style-type: none"> <li>• Where allocated as VRM Class I by other management direction</li> <li>• The congressionally designated utility corridor along U.S. Highway 89 (Public Law 105-355) is allocated as VRM Class III</li> </ul> |
| 277.    | <p><b>Management Direction:</b><br/>No similar management direction.</p>  | <p><b>Management Direction:</b><br/>No similar management direction.</p> |               |               | <p><b>Management Direction:</b><br/>No similar management direction.</p>  | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Cultural use allocations for cultural properties, sites, and settings within the OSNHT management corridor should not include the “discharged from management” allocation when the property supports the nature and purposes of the OSNHT.</p>   |

| Row No. | Alternative A  | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP   |
|---------|--|--|---------------|---------------|--|--|---|
| -       | <b>NATIONAL HISTORIC TRAILS</b>  |  |               |               | <b>Not for analysis. For comparison only.</b>                            |  | -   |
| 278.    | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> |               |               | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Manage recreation within the Paria River and Paria Breaks OSNHT inventory analysis units to emphasize high-quality recreation opportunities; relative freedom from intrusion; opportunities for vicarious experiences; and conservation, protection, and restoration of National Trail resources, qualities, values, and associated settings.</p> <p>The BLM may authorize exceptions to group size limits on a case-by-case basis when those exceptions would be consistent with protection of GSENM objects and with the purposes of the OSNHT.</p> |

| Row No. | Alternative A   | Alternative B   | Alternative C  | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan                                    | Alternative E 2024 Proposed RMP   |
|---------|---|---|--|---------------|--|--|---|
| -       | <b>SCENIC ROUTES</b>  |   |  |               | <b>Not for analysis. For comparison only.</b>  |  | -   |
| 279.    | <b>Goal:</b><br>Manage designated scenic routes to protect values for which they were established.  | <b>Goal:</b><br>Protect and enhance the values for which scenic byways were designated.   |  |               | <b>Goal:</b><br>Manage designated scenic routes to protect values for which they were established. (GSENM ROD 2020, KEPA ROD 2020)   | <b>Goal:</b><br>No similar goal.                                 | <b>Goal:</b><br>Protect and enhance the values for which scenic byways were designated.   |
| 280.    | <b>Objective:</b><br>Continue to coordinate management of National Scenic Byways, Utah Scenic Byways, and Utah Scenic Backways with other agencies, BLM offices, and local and state governments, as appropriate. | <b>Objective:</b><br>Manage designated scenic routes to provide for an enjoyable visitor experience.  |  |               | <b>Objective:</b><br>Continue to coordinate management of National Scenic Byways, Utah Scenic Byways, and Utah Scenic Backways with other agencies, BLM offices, and local and State governments as appropriate. (GSENM ROD 2020, KEPA ROD 2020) | <b>Objective:</b><br>No similar objective.                       | <b>Objective:</b><br>Manage designated scenic routes to provide for an enjoyable visitor experience.  |
| 281.    | <b>Objective:</b><br>Consider currently designated Utah Scenic Byways as Scenic or Back Country Byways.   | <b>Objective:</b><br>Consider BLM Back Country Byways designation for Utah State Scenic Backways and Skutumpah Road.  |  |               | <b>Objective:</b><br>Consider currently designated Utah Scenic Byways as Scenic or Back Country Byways. (GSENM ROD 2020, KEPA ROD 2020)  | <b>Objective:</b><br>No similar management direction.            | <b>Objective:</b><br>Consider BLM Back Country Byways designation for Utah State Scenic Backways and Skutumpah Road.  |
| 282.    | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>Manage viewsheds along designated (federal, state, or BLM) scenic byways as VRM Class II in the foreground/middle ground distance area. | <b>Management Direction:</b><br>Manage a 5-mile corridor from designated (federal, state, or BLM) byway centerlines as VRM Class II. |               | <b>Management Direction:</b><br>No similar management direction.   | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Manage viewsheds along designated (federal, state, or BLM) scenic byways as VRM Class II in the foreground/middle ground distance area. |
| 283.    | <b>Management Direction:</b><br>Do not consider new BLM Back Country Byways.  | <b>Management Direction:</b><br>No similar management direction.  |  |               | <b>Management Direction:</b><br>Do not consider new BLM Back Country Byways. (GSENM ROD 2020, KEPA ROD 2020)   | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>No similar management direction.  |

| Row No. | Alternative A   | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP  |
|---------|---|--|---------------|---------------|---|---|--|
| -       | <b>WILD AND SCENIC RIVERS</b>   |  |               |               | <b>Not for analysis. For comparison only.</b>   |   | -  |
| 284.    | <p><b>Goal:</b><br/>Preserve eligible or suitable rivers, or segments of rivers, and their immediate environments in their free-flowing condition for the protection of their ORVs and for the benefit and enjoyment of present and future generations, giving consideration to other resource values and uses.</p>   |  |               |               | <p><b>Goal:</b><br/>Preserve eligible or suitable rivers, or segments of rivers, and their immediate environments in their free-flowing condition for the protection of their ORVs and for the benefit and enjoyment of present and future generations, giving consideration to other resource values and uses. (GSENM ROD 2020, KEPA ROD 2020)</p>   | <p><b>Goal:</b><br/>No similar goal.</p>  | <p><b>Goal:</b><br/>Preserve eligible or suitable rivers, or segments of rivers, and their immediate environments in their free-flowing condition for the protection of their ORVs and for the benefit and enjoyment of present and future generations, giving consideration to other resource values and uses.</p>  |
| 285.    | <p><b>Management Direction:</b><br/>The following river segments in GSENM have been determined suitable and recommended for congressional designation into the National Wild and Scenic Rivers System. The suitable river segments' classifications are:<sup>10</sup></p> <p><i>Escalante River System</i></p> <ul style="list-style-type: none"> <li>• Escalante River #1; Wild</li> <li>• Escalante River #2; Recreational</li> <li>• Escalante River #3; Wild</li> <li>• Harris Wash; Wild</li> <li>• Lower Boulder Creek; Wild</li> <li>• Slickrock Canyon; Wild</li> <li>• Lower Deer Creek #1; Recreational</li> <li>• Lower Deer Creek #2; Wild</li> <li>• The Gulch #1; Wild</li> </ul> | <p><b>Management Direction:</b><br/>Same as Alternative A, with the change in classification of:</p> <ul style="list-style-type: none"> <li>• Upper Paria River #1; Wild</li> <li>• Lower Sheep Creek; Wild</li> </ul> |               |               | <p><b>Management Direction:</b><br/>Approximately 224 miles of river segments in GSENM have been determined suitable and recommended for congressional designation into the National Wild and Scenic Rivers System. The suitable river segments, classifications, and miles are:<sup>11</sup></p> <ul style="list-style-type: none"> <li>• Escalante River #1; Wild</li> <li>• Escalante River #2; Recreational</li> <li>• Escalante River #3; Wild</li> <li>• Harris Wash; Wild</li> <li>• Lower Boulder Creek; Wild</li> <li>• Slickrock Canyon; Wild</li> <li>• Lower Deer Creek #1; Recreational</li> <li>• Lower Deer Creek #2; Wild</li> <li>• The Gulch #1; Wild</li> <li>• The Gulch #2; Recreational</li> <li>• The Gulch #3; Wild</li> <li>• Steep Creek; Wild</li> </ul> | <p><b>Management Direction:</b><br/>Approximately 252 miles of river segments have been determined suitable and will be recommended for congressional designation into the National Wild and Scenic Rivers System. The suitable river segments include:<sup>12</sup></p> <ul style="list-style-type: none"> <li>• Escalante River 1, 2, 3</li> <li>• Harris Wash</li> <li>• Lower Boulder Creek</li> <li>• Slickrock Canyon</li> <li>• Lower Deer Creek 1, 2</li> <li>• The Gulch 1, 2, 3</li> <li>• Steep Creek</li> <li>• Lower Sand Creek and tributary Willow Patch Creek</li> <li>• Mamie Creek and west tributary</li> <li>• Death Hollow Creek</li> <li>• Calf Creek 1, 2, 3</li> <li>• Twenty-five Mile Wash</li> <li>• Upper Paria River 1, 2</li> </ul> | <p><b>Management Direction:</b><br/>The following river segments in GSENM have been determined suitable and recommended for congressional designation into the National Wild and Scenic Rivers System. The suitable river segments' classifications are:<sup>13</sup></p> <p><i>Escalante River System</i></p> <ul style="list-style-type: none"> <li>• Escalante River #1; Wild</li> <li>• Escalante River #2; Recreational</li> <li>• Escalante River #3; Wild</li> <li>• Harris Wash; Wild</li> <li>• Lower Boulder Creek; Wild</li> <li>• Slickrock Canyon; Wild</li> <li>• Lower Deer Creek #1; Recreational</li> <li>• Lower Deer Creek #2; Wild</li> <li>• The Gulch #1; Wild</li> <li>• The Gulch #2; Recreational</li> <li>• The Gulch #3; Wild</li> <li>• Steep Creek; Wild</li> </ul> |

<sup>10</sup> Suitability determinations were made as part of the 1999 Monument Management Planning effort. The 2020 GSENM and KEPA Approved Plans maintained the suitability determinations, but changed the classifications for the Upper Paria River #1 and Lower Sheep Creek segments

<sup>11</sup> *Id.*

<sup>12</sup> The 1999 Monument Management Planning effort also identified Lower Paria River #2 and Buckskin Gulch/Wire Pass as suitable; however, they are outside GSENM, so they are not brought forward into the alternatives.

<sup>13</sup> Suitability determinations were made as part of the 1999 Monument Management Planning effort. The 2020 GSENM and KEPA Approved RMPs maintained the suitability determinations, but changed the classifications for the Upper Paria River #1 and Lower Sheep Creek segments.

| Row No.         | Alternative A   | Alternative B | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP  |
|-----------------|---|---------------|---------------|---------------|---|---|--|
| -               | <b>WILD AND SCENIC RIVERS</b>   |               |               |               | <b>Not for analysis. For comparison only.</b>   |   | -  |
| 285.<br>(cont.) | <ul style="list-style-type: none"> <li>• The Gulch #2; Recreational</li> <li>• The Gulch #3; Wild</li> <li>• Steep Creek; Wild</li> <li>• Lower Sand Creek; Wild</li> <li>• Willow Patch Creek; Wild</li> <li>• Mamie Creek and West Tributary; Wild</li> <li>• Death Hollow Creek; Wild</li> <li>• Calf Creek #1; Wild</li> <li>• Calf Creek #2; Scenic</li> <li>• Calf Creek #3; Recreational</li> <li>• Twenty-five-mile Wash; Wild</li> </ul> <p><i>Paria River System</i></p> <ul style="list-style-type: none"> <li>• Upper Paria River #1; Recreational</li> <li>• Upper Paria River #2; Recreational</li> <li>• Lower Paria River #1; Recreational</li> <li>• Deer Creek Canyon; Wild</li> <li>• Snake Creek; Wild</li> <li>• Hogeye Creek; Wild</li> <li>• Kitchen Canyon; Wild</li> <li>• Starlight Canyon; Wild</li> <li>• Lower Sheep Creek; Recreational</li> <li>• Hackberry Creek; Wild</li> <li>• Lower Cottonwood Creek; Recreational</li> </ul> | (see above)   |               |               | <ul style="list-style-type: none"> <li>• Lower Sand Creek; Wild</li> <li>• Willow Patch Creek; Wild</li> <li>• Mamie Creek and West Tributary; Wild</li> <li>• Death Hollow Creek; Wild</li> <li>• Calf Creek #1; Wild</li> <li>• Calf Creek #2; Scenic</li> <li>• Calf Creek #3; Recreational</li> <li>• Twenty-five-mile Wash; Wild</li> <li>• Upper Paria River #1; Recreational</li> <li>• Upper Paria River #2; Recreational</li> <li>• Lower Paria River #1; Recreational</li> <li>• Deer Creek Canyon; Wild</li> <li>• Snake Creek; Wild</li> <li>• Hogeye Creek; Wild</li> <li>• Kitchen Canyon; Wild</li> <li>• Starlight Canyon; Wild</li> <li>• Lower Sheep Creek; Wild</li> <li>• Hackberry Creek; Wild</li> <li>• Lower Cottonwood Creek; Recreational</li> </ul> <p>(GSENM ROD 2020, KEPA ROD 2020)</p> | <ul style="list-style-type: none"> <li>• Lower Paria River 1, 2</li> <li>• Deer Creek Canyon</li> <li>• Snake Creek Hogeye Creek</li> <li>• Kitchen Canyon</li> <li>• Starlight Canyon</li> <li>• Lower Sheep Creek</li> <li>• Hackberry Creek</li> <li>• Lower Cottonwood Creek</li> <li>• Buckskin Gulch/Wire Pass</li> </ul> | <ul style="list-style-type: none"> <li>• Lower Sand Creek; Wild</li> <li>• Willow Patch Creek; Wild</li> <li>• Mamie Creek and West Tributary; Wild</li> <li>• Death Hollow Creek; Wild</li> <li>• Calf Creek #1; Wild</li> <li>• Calf Creek #2; Scenic</li> <li>• Calf Creek #3; Recreational</li> <li>• Twenty-five-mile Wash; Wild</li> </ul> <p><i>Paria River System</i></p> <ul style="list-style-type: none"> <li>• Upper Paria River #1; Wild</li> <li>• Upper Paria River #2; Recreational</li> <li>• Lower Paria River #1; Recreational</li> <li>• Deer Creek Canyon; Wild</li> <li>• Snake Creek; Wild</li> <li>• Hogeye Creek; Wild</li> <li>• Kitchen Canyon; Wild</li> <li>• Starlight Canyon; Wild</li> <li>• Lower Sheep Creek; Wild</li> <li>• Hackberry Creek; Wild</li> <li>• Lower Cottonwood Creek; Recreational</li> </ul> |

| Row No. | Alternative A   | Alternative B  | Alternative C   | Alternative D   | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP  |
|---------|---|--|---|---|---|--|--|
| -       | <b>WILD AND SCENIC RIVERS</b>   |  |   |   | <b>Not for analysis. For comparison only.</b>   |  | -  |
| 286.    | <b>Management Direction:</b><br>Manage suitable segments for their free-flowing condition, identified tentative classification, and preservation of ORVs.   | <b>Management Direction:</b><br>Manage rivers determined as suitable for designation under the Wild and Scenic Rivers Act, or segments of such rivers, within 0.25 miles of the ordinary high-water mark on each side of the river, for their free-flowing condition, water quality, tentative classification, and any ORVs until, a decision on suitability can be made for identified eligible rivers, or in the case of suitable rivers, until Congress designates the river or releases it for other uses. |   |   | <b>Management Direction:</b><br>Manage suitable segments for their free-flowing condition, identified tentative classification, and preservation of ORVs. (GSENM ROD 2020, KEPA ROD 2020)   | <b>Management Direction:</b><br>Those streams found suitable will be managed for protection of the resources associated with the stream. Such action will not entail any additional state water rights and will not result in a federal reserved water right unless Congress acts to officially designate the stream or stream segment as part of the National Wild and Scenic Rivers System. Upon such designation, if any, the federal reserved water right thus established would, by law, be established with the priority date of the designation and would be junior to all preexisting water rights, in accordance with the existing state priority system. Senior rights in any stream designated would be unaffected. | <b>Management Direction:</b><br>Manage rivers determined as suitable for designation under the Wild and Scenic Rivers Act, or segments of such rivers, within 0.25 miles of the ordinary high-water mark on each side of the river, for their free-flowing condition, water quality, tentative classification, and any ORVs until, a decision on suitability can be made for identified eligible rivers, or in the case of suitable rivers, until Congress designates the river or releases it for other uses. |
| 287.    | <b>Management Direction:</b><br>Manage suitable segments as follows:<br><ul style="list-style-type: none"> <li>• Avoid ROWs (including communication sites) in all suitable WSR corridors, except in designated utility corridors.</li> </ul> | <b>Management Direction:</b><br>Manage suitable segments as follows:<br><ul style="list-style-type: none"> <li>• ROW exclusions in all suitable wild segments of WSR corridors</li> <li>• ROW avoidance in all suitable scenic and recreational segments of WSR corridors, except in designated utility corridors</li> </ul>   | <b>Management Direction:</b><br>Manage suitable segments as follows:<br><ul style="list-style-type: none"> <li>• ROW exclusions in all suitable WSR corridors in the outback and primitive areas</li> <li>• ROW avoidance in all other suitable WSR corridors, except in designated utility corridors.</li> </ul> | <b>Management Direction:</b><br>Manage suitable segments as follows:<br><ul style="list-style-type: none"> <li>• ROW exclusions in all suitable WSR corridors, except in designated utility corridors.</li> </ul> | <b>Management Direction:</b><br>Manage suitable segments as follows:<br><ul style="list-style-type: none"> <li>• Avoid ROWs (including communication sites) in all suitable WSR corridors, except in designated utility corridors. (GSENM ROD 2020, KEPA ROD 2020)</li> </ul> | <b>Management Direction:</b><br>No similar management direction.   | <b>Management Direction:</b><br>Manage suitable segments as follows:<br><ul style="list-style-type: none"> <li>• ROW exclusions in all suitable WSR corridors in the outback and primitive areas</li> <li>• ROW avoidance in all other suitable WSR corridors, except in designated utility corridors.</li> </ul>  |
| 288.    | <b>Management Direction:</b><br>Manage suitable segments as follows:<br><ul style="list-style-type: none"> <li>• WSR corridors within WSAs, and ISAs will be managed as VRM Class I.</li> </ul>   | <b>Management Direction:</b><br>Manage suitable segments as follows:<br><ul style="list-style-type: none"> <li>• WSR wild segment corridors and all corridors within WSAs, ISAs, and lands with wilderness characteristics in the primitive area will be managed as VRM Class I.</li> <li>• All other WSR scenic and recreation segments will be managed as VRM Class II.</li> </ul>   |   |   | <b>Management Direction:</b><br>Manage suitable segments as follows:<br><ul style="list-style-type: none"> <li>• WSR corridors within WSAs will be managed as VRM Class I (GSENM ROD 2020, KEPA ROD 2020)</li> </ul>  | <b>Management Direction:</b><br>No similar management direction.   | <b>Management Direction:</b><br>Manage suitable segments as follows:<br><ul style="list-style-type: none"> <li>• WSR wild segment corridors and all corridors within WSAs and ISAs would be managed as VRM Class I.</li> <li>• All other WSR scenic and recreation segments would be managed as VRM Class II.</li> </ul>   |

| Row No. | Alternative A   | Alternative B | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP  |
|---------|---|---------------|---------------|---------------|---|---|--|
| -       | <b>WILD AND SCENIC RIVERS</b>   |               |               |               | <b>Not for analysis. For comparison only.</b>   |   | -  |
| 289.    | <p><b>Management Direction:</b><br/>                     The following river segments in GSENM have been determined eligible for inclusion in the National Wild and Scenic Rivers System. The BLM will continue to manage the eligible segments for their free-flowing condition, water quality, identified tentative classification, and preservation of ORVs until a determination of their suitability can be made with the Glen Canyon National Recreation Area. The eligible river segments and classifications are:<sup>14</sup></p> <ul style="list-style-type: none"> <li>• Scorpion Gulch; Wild</li> <li>• Fools Canyon; Wild</li> <li>• Coyote Gulch; Wild</li> </ul> |               |               |               | <p><b>Management Direction:</b><br/>                     Approximately 1.51 miles of river segments in GSENM have been determined eligible for inclusion in the National Wild and Scenic Rivers System. The BLM will continue to manage the eligible segments for their free-flowing condition, identified tentative classification, and preservation of ORVs until a determination of their suitability can be made with Glen Canyon National Recreation Area. The eligible river segments, classifications, and miles are:<sup>14</sup></p> <ul style="list-style-type: none"> <li>• Scorpion Gulch; Wild; 0.81 miles</li> <li>• Fools Canyon; Wild; 0.001 miles</li> <li>• Coyote Gulch; Wild; 0.70 miles</li> </ul> | <p><b>Management Direction:</b><br/>                     No similar management direction.</p> | <p><b>Management Direction:</b><br/>                     The following river segments in GSENM have been determined eligible for inclusion in the National Wild and Scenic Rivers System. The BLM would continue to manage the eligible segments for their free-flowing condition, water quality, identified tentative classification, and preservation of ORVs until a determination of their suitability can be made within the Glen Canyon National Recreation Area. The eligible river segments and classifications are:<sup>14</sup></p> <ul style="list-style-type: none"> <li>• Scorpion Gulch; Wild</li> <li>• Fools Canyon; Wild</li> <li>• Coyote Gulch; Wild</li> </ul> |

<sup>14</sup> Eligibility determinations were made as part of the 1999 Monument Management Planning effort.



| Row No. | Alternative A  | Alternative B | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP  |
|---------|--|---------------|---------------|---------------|--|--|--|
| -       | <b>WILDERNESS STUDY AREAS (WSAS)</b>   |               |               |               | <b>Not for analysis. For comparison only.</b>  |  | -  |
| 290.    | <b>Goal:</b><br>Manage WSAs and ISAs in a manner that does not impact or impair their suitability for designation as wilderness. |               |               |               | <b>Goal:</b><br>Manage WSAs and ISAs in a manner that does not impact or impair their suitability for designation as wilderness. (GSENM ROD 2020, KEPA ROD 2020) | <b>Goal:</b><br>Existing WSAs in the Monument will be managed under the BLM's Interim Management Policy and Guidelines for Lands Under Wilderness Review (BLM Manual H-8550-1) until legislation takes effect to change their status. The major objective of the Interim Management Policy is to manage lands under wilderness review in a manner that does not impair their suitability for designation as wilderness. In general, the only activities permissible under the Interim Management Policy are temporary uses that create no new surface disturbance nor involve permanent placement of structures. Temporary, nondisturbing activities, as well as activities governed by valid existing rights, may generally continue in WSAs. | <b>Goal:</b><br>Manage WSAs and ISAs in a manner that does not impact or impair their suitability for designation as wilderness. |

| Row No. | Alternative A   | Alternative B | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP   |
|---------|---|---------------|---------------|---------------|---|---|---|
| -       | <b>WILDERNESS STUDY AREAS (WSAs)</b>  |               |               |               | <b>Not for analysis. For comparison only.</b>   |   | -   |
| 291.    | <b>Allocation:</b><br>Manage the following WSAs (this includes ISAs): <ul style="list-style-type: none"> <li>• Phipps-Death Hollow</li> <li>• Steep Creek</li> <li>• North Escalante Canyons/The Gulch</li> <li>• Carcass Canyon</li> <li>• Scorpion</li> <li>• Escalante Canyons Tract I</li> <li>• Escalante Canyons Tract 5</li> <li>• Devils Garden</li> <li>• The Blues</li> <li>• Fiftymile Mountain</li> <li>• Death Ridge</li> <li>• Burning Hills</li> <li>• Mud Spring Canyon</li> <li>• The Cockscomb</li> <li>• Paria/Hackberry</li> <li>• Wahweap</li> </ul> |               |               |               | <b>Allocation:</b><br>Manage 881,997 acres as WSAs (this includes ISAs) (GSENM ROD 2020, KEPA ROD 2020). <ul style="list-style-type: none"> <li>• Phipps-Death Hollow ISA- 42,731 acres</li> <li>• Steep Creek WSA- 21,896 acres</li> <li>• North Escalante Canyons/The Gulch ISA- 120,204 acres</li> <li>• Carcass Canyon WSA- 47,351 acres</li> <li>• Scorpion WSA- 35,884 acres</li> <li>• Escalante Canyons Tract I ISA- 360 acres</li> <li>• Escalante Canyons Tract 5 ISA- 760 acres</li> <li>• Devils Garden ISA- 638 acres</li> <li>• The Blues WSA- 19,030 acres</li> <li>• Fiftymile Mountain WSA- 148,802 acres</li> <li>• Death Ridge WSA- 63,667 acres</li> <li>• Burning Hills WSA- 61,550 acres</li> <li>• Mud Spring Canyon WSA- 38,075 acres</li> <li>• The Cockscomb WSA- 10,827 acres</li> <li>• Paria/Hackberry and Paria/Hackberry 202 WSA- 135,822 acres</li> <li>• Wahweap WSA- 134,400 acres</li> </ul> | <b>Allocation:</b><br>The Monument contains 16 WSAs, totaling approximately 881,997 acres, or about 47 percent of the BLM acres in the Monument: <ul style="list-style-type: none"> <li>• Phipps-Death Hollow ISA – 42,731 acres</li> <li>• Steep Creek WSA – 21,896 acres</li> <li>• North Escalante Canyons/The Gulch ISA – 120,204 acres</li> <li>• Carcass Canyon WSA – 47,351 acres</li> <li>• Scorpion WSA – 35,884 acres</li> <li>• Escalante Canyons Tract I ISA – 360 acres</li> <li>• Escalante Canyons Tract 5 ISA – 760 acres</li> <li>• Devils Garden ISA – 638 acres</li> <li>• The Blues WSA – 19,030 acres</li> <li>• Fiftymile Mountain WSA – 148,802 acres</li> <li>• Death Ridge WSA – 63,667 acres</li> <li>• Burning Hills WSA – 61,550 acres</li> <li>• Mud Spring Canyon WSA – 38,075 acres</li> <li>• The Cockscomb WSA – 10,827 acres</li> <li>• Paria/Hackberry and Paria/Hackberry 202 WSA – 135,822 acres</li> <li>• Wahweap WSA – 134,400 acres</li> </ul> | <b>Allocation:</b><br>Manage the following WSAs (this includes ISAs): <ul style="list-style-type: none"> <li>• Phipps-Death Hollow</li> <li>• Steep Creek</li> <li>• North Escalante Canyons/The Gulch</li> <li>• Carcass Canyon</li> <li>• Scorpion</li> <li>• Escalante Canyons Tract I</li> <li>• Escalante Canyons Tract 5</li> <li>• Devils Garden</li> <li>• The Blues</li> <li>• Fiftymile Mountain</li> <li>• Death Ridge</li> <li>• Burning Hills</li> <li>• Mud Spring Canyon</li> <li>• The Cockscomb</li> <li>• Paria/Hackberry and Paria/Hackberry 202 WSA</li> <li>• Wahweap</li> </ul> |

| Row No. | Alternative A   | Alternative B   | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP   |
|---------|---|---|---------------|---------------|---|--|---|
| -       | <b>WILDERNESS STUDY AREAS (WSAs)</b>  |   |               |               | Not for analysis. For comparison only.  |  | -   |
| 292.    | <p><b>Management Direction:</b><br/>Manage WSAs as follows, subject to valid existing rights and grandfathered uses:</p> <ul style="list-style-type: none"> <li>• VRM Class I</li> <li>• ROW exclusion</li> <li>• OHV limited areas</li> </ul>  | <p><b>Management Direction:</b><br/>Manage WSAs as follows, subject to valid existing rights and grandfathered uses:</p> <ul style="list-style-type: none"> <li>• VRM Class I</li> <li>• ROW exclusion</li> <li>• OHV closed areas</li> </ul>   |               |               | <p><b>Management Direction:</b><br/>Manage WSAs as follows, subject to valid existing rights and grandfathered uses (GSENM ROD 2020, KEPA ROD 2020):</p> <ul style="list-style-type: none"> <li>• VRM Class I</li> <li>• ROW exclusion</li> <li>• OHV limited areas</li> </ul>  | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Manage WSAs as follows, subject to valid existing rights and grandfathered uses:</p> <ul style="list-style-type: none"> <li>• VRM Class I</li> <li>• ROW exclusion</li> <li>• OHV closed areas</li> </ul>   |
| 293.    | <p><b>Management Direction:</b><br/>Should any WSA or ISAs, in whole or in part, be released from wilderness consideration, manage such released lands in accordance with the goals, objectives, and management prescriptions established in this RMP, unless otherwise specified by Congress in its releasing legislation. Examine proposals in the released areas on a case-by-case basis but defer all actions that are inconsistent with RMP goals, objectives, and prescriptions until a land use plan amendment is completed.</p> | <p><b>Management Direction:</b><br/>Should any WSA or ISAs, in whole or in part, be released from wilderness consideration, continue past management of such released lands, unless otherwise specified by Congress in its releasing legislation, in a manner to ensure that GSENM objects are protected. The following will occur:</p> <ul style="list-style-type: none"> <li>• Re-inventories for wilderness characteristics of all released WSAs not designated as wilderness.</li> <li>• Until inventories for wilderness characteristics are completed, and all steps necessary have been completed to establish management of the released areas moving forward, no proposals/actions will occur in the released areas unless consistent with, at a minimum, the protection wilderness characteristics and protection of GSENM objects, or for public health and safety.</li> </ul> |               |               | <p><b>Management Direction:</b><br/>Should any WSA or ISAs, in whole or in part, be released from wilderness consideration, manage such released lands in accordance with the goals, objectives, and management prescriptions established in this RMP, unless otherwise specified by Congress in its releasing legislation. Examine proposals in the released areas on a case-by-case basis but defer all actions that are inconsistent with RMP goals, objectives, and prescriptions until a land use plan amendment is completed. (GSENM ROD 2020, KEPA ROD 2020)</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Should any WSA or ISAs, in whole or in part, be released from wilderness consideration, manage such released lands, unless otherwise specified by Congress in its releasing legislation, in a manner to ensure that GSENM objects are protected. The following would occur:</p> <ul style="list-style-type: none"> <li>• Re-inventories for wilderness characteristics of all released WSAs not designated as wilderness.</li> <li>• Until inventories for wilderness characteristics are completed, and all steps necessary have been completed to establish management of the released areas moving forward, no proposals/actions would occur in the released areas unless consistent with the underlying Primitive Area management direction.</li> </ul> |
| 294.    | <p><b>Management Direction:</b><br/>Prohibit off-route parking or vehicle-based camping in WSAs.</p>  | <p><b>Management Direction:</b><br/>No similar management direction.</p>  |               |               | <p><b>Management Direction:</b><br/>Prohibit off-route parking in WSAs. (GSENM ROD 2020, KEPA ROD 2020)</p>   | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>No similar management direction.</p>  |

| Row No. | Alternative A  | Alternative B   | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan                                    | Alternative E 2024 Proposed RMP   |
|---------|--|---|---------------|---------------|--|--|---|
| -       | <b>PUBLIC HEALTH AND SAFETY</b>  |   |               |               | Not for analysis. For comparison only.   |  | -   |
| 295.    | <b>Goal:</b><br>Reduce hazards to public health and safety.  | <b>Goal:</b><br>Promote the health and safety to visitors in GSENM.   |               |               | <b>Goal:</b><br>Reduce hazards to public health and safety. (GSENM ROD 2020, KEPA ROD 2020)  | <b>Goal:</b><br>No similar goal.                                 | <b>Goal:</b><br>Promote the health and safety to visitors in GSENM.   |
| 296.    | <b>Objective:</b><br>Ensure that human health and safety concerns on public lands remain a major priority.   | <b>Objective:</b><br>Provide for opportunities in GSENM that minimize health and safety hazards.  |               |               | <b>Objective:</b><br>Ensure that human health and safety concerns on public lands remain a major priority. (GSENM ROD 2020, KEPA ROD 2020)   | <b>Objective:</b><br>No similar objective.                       | <b>Objective:</b><br>Provide for opportunities in GSENM that minimize health and safety hazards   |
| 297.    | <b>Management Direction:</b><br>Minimize or mitigate hazardous or potentially hazardous sites and situations, including hazardous materials, hazardous or solid wastes, abandoned mine sites, abandoned well sites, and other potential hazards on public lands.<br><br>Minimize the potential for intentional or accidental releases of hazardous materials or wastes and solid wastes onto public lands. | <b>Management Direction:</b><br>Remediate hazardous or potentially hazardous sites and situations, including hazardous materials, hazardous or solid wastes, abandoned mine sites, abandoned well sites, and other potential hazards. |               |               | <b>Management Direction:</b><br>Minimize or mitigate hazardous or potentially hazardous sites and situations, including hazardous materials, hazardous or solid wastes, abandoned mine sites, abandoned well sites, and other potential hazards on public lands. (GSENM ROD 2020, KEPA ROD 2020)<br><br>Minimize the potential for intentional or accidental releases of hazardous materials or wastes and solid wastes onto public lands. (GSENM ROD 2020, KEPA ROD 2020) | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Remediate hazardous or potentially hazardous sites and situations, including hazardous materials, hazardous or solid wastes, abandoned mine sites, abandoned well sites, and other potential hazards. |

| Row No. | Alternative A  | Alternative B   | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs  | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP  |
|---------|--|---|---------------|---------------|---|---|--|
| -       | <b>SCIENCE</b>   |   |               |               | Not for analysis. For comparison only.  |   | -  |
| 298.    | <b>Goal:</b><br>Provide opportunities for science and research on GSENM. | <b>Goal:</b><br>Fulfill the vision of GSENM as a premier outdoor laboratory and a place for understanding our environment, our history, our planet’s past, and our place in the universe. |               |               | <b>Goal:</b><br>Provide opportunities for science and research on GSENM. (GSENM ROD 2020) | <b>Goal:</b><br>Monument management priorities and budgets will focus on a comprehensive understanding of the resources of the Monument while assisting in the development of improved and innovative land management, restoration, and rehabilitation practices. The natural, physical, and social sciences, including the study of history will each play an essential role in science and research activities. Research projects will have a multi-scale and interdisciplinary approach when possible. Recreation and other uses will be managed to complement science and research objectives (2000 MMP). | <b>Goal:</b><br>Encourage, support, and conduct scientific research within GSENM to fulfill the vision of GSENM as an outdoor laboratory to improve understanding of our environment, our history, our planet’s past, and our place in the universe.         |
| 299.    | <b>Objective:</b><br>No similar objective.                               | <b>Objective:</b><br>Ensure best available scientific information is a primary foundation for all management decisions.   |               |               | <b>Objective:</b><br>No similar objective.  | <b>Objective:</b><br>No similar objective.  | <b>Objective:</b><br>No similar objective.   |
| 300.    | <b>Objective:</b><br>No similar objective.                               | <b>Objective:</b><br>No similar objective.  |               |               | <b>Objective:</b><br>No similar objective.  | <b>Objective:</b><br>No similar objective.  | <b>Objective:</b><br>Encourage and advance scientific research in GSENM, consistent with the protection of GSENM objects , to maximize benefits to the management goals of GSENM, to Tribal Nations, to other stakeholders, and to the scientific community. |
| 301.    | <b>Objective:</b><br>No similar objective.                               | <b>Objective:</b><br>No similar objective.  |               |               | <b>Objective:</b><br>No similar objective.  | <b>Objective:</b><br>No similar objective.  | <b>Objective:</b><br>Improves knowledge and understanding of the species present in the GSENM, general understanding of the ecosystem processes, cycles, and anthropogenic influences in GSENM.  |

| Row No. | Alternative A  | Alternative B   | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP  |
|---------|--|---|---------------|---------------|--|---|--|
| -       | <b>SCIENCE</b>   |   |               |               | Not for analysis. For comparison only.                           |   | -  |
| 302.    | <b>Objective:</b><br>No similar objective.                       | <b>Objective:</b><br>No similar objective.  |               |               | <b>Objective:</b><br>No similar objective.                       | <b>Objective:</b><br>No similar objective.  | <b>Objective:</b><br>Improves knowledge and understanding of geological, cultural, historic, archaeological, and paleontological resources associated with GSENM .   |
| 303.    | <b>Objective:</b><br>No similar objective.                       | <b>Objective:</b><br>No similar objective.  |               |               | <b>Objective:</b><br>No similar objective.                       | <b>Objective:</b><br>No similar objective.  | <b>Objective:</b><br>Improves knowledge and understanding of the social, economic, and recreational benefits associated with GSENM .   |
| 304.    | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Design scientific research projects to avoid impacts on and advance the protection of GSENM objects. Allow scientific research that has potential or actual short-term or temporary adverse effects on resources (including GSENM objects) in order to provide for exceptionally high-value science and/or long-term protection and <b>resiliency</b> of resources. |               |               | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>Design scientific research projects to be consistent with the protection of GSENM objects.   |
| 305.    | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Prioritize inventory of and basic research on GSENM objects in danger of being lost over short <b>time frames</b> (100 years or less) over those that are more stable in the long term.   |               |               | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>The first priority for conducting BLM-sponsored research will be to study, collect, or record scientific information that is most at risk of being damaged or lost through disturbance or the passage of time, including oral histories and ethnologies related to the Monument area. | <b>Management Direction:</b><br>Prioritize inventory of and research on GSENM objects and resources in danger of being lost over short time frames (100 years or less) over those that are more stable in the long term. |
| 306.    | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Actively promote basic and applied science on GSENM resources and objects and disseminate the findings of such research.  |               |               | <b>Management Direction:</b><br>No similar management direction. | <b>Management Direction:</b><br>Conduct applied research regarding the management of natural systems, including disturbance and recovery strategies.  | <b>Management Direction:</b><br>Promote GSENM as a place to conduct responsible basic and applied science related to GSENM objects and resources. Disseminate the findings of such research, as appropriate.             |

| Row No. | Alternative A  | Alternative B  | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan  | Alternative E 2024 Proposed RMP  |
|---------|--|--|---------------|---------------|--|--|--|
| -       | <b>SCIENCE</b>   |  |               |               | Not for analysis. For comparison only.                                   |  | -  |
| 307.    | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Allow minor deviations for group size and camping stay on science permits. Deviations will conform to the science plan, be concurred with through an identification process as part of processing the permit, and be approved by the BLM Authorized Officer.</p> |               |               | <p><b>Management Direction:</b><br/>No similar management direction.</p> | <p><b>Management Direction:</b><br/>Researchers will have to comply with the decisions in this Plan. However, some science and research activities may require the use of equipment, surface disturbance, and/or personnel which could exceed the management prescriptions outlined for visitors and other users. Except where specifically prohibited (such as in relict plant areas, wildlife protected activity centers), the BLM will consider exceptions to the Plan prescriptions during the special-use permitting process for extremely high-value research opportunities, especially for those opportunities that may not be available elsewhere. Research projects focused on protecting resources at risk will also be considered for exceptions to zone prescriptions. The GSENM Advisory Committee will be consulted on whether research proposals which require restricted activities warrant the requested exceptions. Evaluation will consider whether the proposed research can be permitted in a manner consistent with the protection of Monument resources and whether the methods proposed are the minimum necessary to achieve the desired research objective.</p> | <p><b>Management Direction:</b><br/>Exceptions to group size limits and camping stays would be considered as part of the scientific research authorization process, on a case-by-case basis approved by the BLM Authorized Officer (see Recreation and Visitor Services management direction for group size limit direction and exceptions).</p> |

| Row No. | Alternative A  | Alternative B   | Alternative C | Alternative D | 2020 GSENM and KEPA RMPs   | 2000 Monument Management Plan   | Alternative E 2024 Proposed RMP   |
|---------|--|---|---------------|---------------|--|---|---|
| -       | <b>SCIENCE</b>   |   |               |               | Not for analysis. For comparison only.   |   | -   |
| 308.    | <b>Management Direction:</b><br>No similar management direction.   | <b>Management Direction:</b><br>Maintain a GSENM science plan that directs the administration of a science program and is informed by Indigenous knowledge. |               |               | <b>Management Direction:</b><br>No similar management direction.   | <b>Management Direction:</b><br>No similar management direction.  | <b>Management Direction:</b><br>Maintain a GSENM science plan that directs the administration of a science program that is informed by both Western scientific approaches and Indigenous knowledge. |
| 309.    | <b>Management Direction:</b><br>Require a science permit application for internal and external research projects on GSENM. The application will be reviewed by an interdisciplinary team and approved or denied by the BLM Authorized Officer. Require appropriate collection permits or licenses. | <b>Management Direction:</b><br>Require a permit for scientific research projects in GSENM.   |               |               | <b>Management Direction:</b><br>Require a science permit application for internal and external research projects on GSENM. The application will be reviewed by an interdisciplinary team and approved or denied by an authorized officer. Require appropriate collection permits or licenses. (GSENM ROD 2020) | <b>Management Direction:</b><br>All research and related educational activities will require special-use permits. | <b>Management Direction:</b><br>Require a scientific research authorization for all scientific research activities and projects.  |



## Chapter 3. Affected Environment and Environmental Consequences

This chapter describes the affected environment and the environmental consequences for the resources likely to be affected by alternatives being evaluated in this [Proposed RMP/Final EIS](#). [Appendix I](#) provides additional context on the affect environment for the resources likely to be affected. Much of this additional context was originally included in Chapter 3 of the Draft EIS but was subsequently moved to [Appendix I](#) in the Final EIS and more concise descriptions of the most pertinent elements of the affected environment are now summarized in Chapter 3 of the Final EIS. In 2022, the BLM released the AMS, which describes the baseline conditions in the decision area. This chapter incorporates the AMS [analysis](#) and includes new data or information obtained since the AMS was finalized.

The discussion of potential impacts under each resource provides the scientific and analytic basis for evaluating the potential impacts of each alternative described in [Chapter 2](#). Due to the programmatic nature of the RMP alternatives, the analysis contained in the sections below is both qualitative and quantitative. Each resource area includes a summary of impacts common to all alternatives, an analysis of impacts for each alternative, and a description of cumulative impacts. [Appendix F](#), Analytical Framework, outlines and describes the indicators, analysis areas, and assumptions used for each resource analysis.

This impact analysis identifies impacts that may enhance or improve a resource [as a result of](#) management actions, as well as those impacts that have the potential to impair a resource. However, the evaluations are confined to the actions that have direct, immediate, and more prominent effects. If an activity or action is not addressed [in each](#) section, no impacts are expected, or the impact is expected to be minimal based on professional judgment. [Section 1.4.2](#) in [Chapter 1](#) describes those resource issues that did not receive detailed analysis. [Appendix C](#), [Best Management Practices](#), contains BMPs that could be implemented under Alternatives B, C, D [and E](#) to [mitigate site-specific impacts](#).

For organizational purposes, [Chapter 3](#) is divided into sections by subject area (such as water resources, wildlife, and recreation) from the land use planning handbook, BLM Handbook H-1601-1. Though they are described and analyzed in discrete sections, these subjects are dynamic and interrelated. A change in one resource can have cascading or synergistic impacts on other resources. As a result, there is some overlap among the resource sections in [Chapter 3](#), and the impacts described in one section may depend on the analysis from another section.

The impact analyses for direct, indirect, and cumulative impacts for all resources are detailed in the sections below. [Analytical Framework \(Appendix F\)](#) describes reasonably foreseeable future actions considered in the cumulative impact analyses. [It also presents the background for and approach to identifying the environmental, social, and economic impacts on the human and natural environment that are predicted to result from implementing the alternatives presented in Chapter 2.](#)

The BLM used GIS data to perform acreage calculations. Calculations depend on the quality and availability of data. Most calculations in this RMP are rounded to the nearest 100 acres or 1 mile. Given the scale of the analysis and the compatibility constraints between data sets, all [calculations](#) are approximate; they

serve for comparison and analytic purposes only. The BLM may receive additional or updated data; therefore, acreages may be recalculated and revised [during implementation-level planning efforts](#).

### 3.1 AIR RESOURCES

#### 3.1.1 Air Quality

##### [Affected Environment](#)

Air quality is measured by the concentration of air pollutants and air quality-related values, such as visibility and atmospheric deposition, within a geographic area. Ecological factors such as wind, temperature, humidity, geographic features, vegetation, and wildfire, as well as human-related activities such as recreation and livestock grazing, have the potential to affect air quality.

Air quality indicators include criteria air pollutants, hazardous air pollutants (HAPs), and sulfur and nitrogen compounds that could contribute to visibility impairment and atmospheric deposition. [The EPA, in accordance with the Clean Air Act, as amended, has established national ambient air quality standards \(NAAQS\) for six air pollutants: carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter \(both particulate matter less than 10 microns in diameter \[PM<sub>10</sub>\] and particulate matter less than 2.5 microns in diameter \[PM<sub>2.5</sub>\]\), ozone, and lead. The NAAQS include primary standards established to protect public health, including the sensitive populations, and secondary standards to provide public welfare protection, including protection against decreased visibility and environmental damage. Current EPA-designated NAAQS for criteria pollutants are listed on the EPA website at <https://www.epa.gov/criteria-air-pollutants/naaqs-table>.](#)

Air quality in the planning area is typical of undeveloped regions in the western United States, [where ground-level ozone and particulate matter are regional concerns and can be transported both into and out of the planning area. Kane and Garfield Counties are currently designated attainment/unclassifiable<sup>1</sup> for all NAAQS. Monitoring stations that collect air quality data or that were recently decommissioned in or near the planning area include a Utah Division of Air Quality-operated ozone monitoring station in the town of Escalante in Garfield County \(Utah Division of Air Quality 2022\), a PM<sub>2.5</sub> monitoring station in Bryce Canyon National Park,<sup>2</sup> and monitoring stations for nitrogen oxides and particulate matter by the Alton Coal Mine. A comparison of the local stations to regulatory stations in Enoch and Hurricane show air pollutant concentrations are much lower in GSENM than at more urbanized monitoring locations.](#)

Ozone can inflame and damage human airways and aggravate asthma and other lung diseases. [Volatile Organic Compounds \(VOCs\) react in the presences of sunlight to form ozone and smog, which are more problematic during periods of atmospheric stability and in valley bottom areas prone to inversions. VOCs increase during periods of high wildfire or prescribed fire activity. Based on data collected by the Utah Division of Air Quality in the town of Escalante and by federal agencies at Bryce Canyon National Park, Capitol Reef National Park, and Glen Canyon, ozone concentrations show a relatively unchanging trend between 2012 and 2022. The 3-year average of the fourth-highest annual 8-hour ozone concentrations in the planning area ranged between 0.063 and 0.068 parts per million between 2012 and 2022 \(Appendix I,](#)

---

<sup>1</sup> Areas that do not meet the national standard are called nonattainment areas. If the air quality in a geographic area meets the national standard, it is called an attainment area (designated “attainment/unclassifiable”); in some cases, the EPA is not able to determine an area’s status after evaluating the available information; those areas are designated “unclassifiable.”

<sup>2</sup> <https://map.purpleair.com/1/mAQI/a43200/p0/cC0#10.27/37.3715/-112.4033>

**Table I-2).** Estimates show that while recent regional ozone concentrations remain below the NAAQS, values are just below the current standards, and historical data records show past exceedances.

Particulate matter can be emitted directly and can form from secondary reactions in the atmosphere. Due to their smaller size, PM<sub>2.5</sub> (fine particles) pose a greater risk to human health and the environment than PM<sub>10</sub> (course particles). Fine particles are also the main cause of haze. Wildfires can be a major contributor of PM<sub>2.5</sub> emissions. PM<sub>2.5</sub> wildfire emissions in Kane County contributed a much larger proportion of total annual emissions (42 percent) than the total annual wildfire emissions of PM<sub>2.5</sub> in Garfield County (3 percent). In Kane County, wildfires were the second major source of PM<sub>10</sub> emissions (10 percent). PM<sub>10</sub> is an issue during dust storms or when kicked up from other activities in this dry region. Locations vulnerable to decreasing air quality due to PM<sub>10</sub> in the planning area include the immediate operation areas around surface-disturbing activities, such as construction of major ROW projects. Details on county-wide annual emission of other criteria air pollutants and their health and environmental effects can be found in **Appendix I, Table I-1**. In the planning area counties, biogenic sources make up 73 percent of total nitrogen oxide emissions. Wildfires contributed a major portion of total annual carbon monoxide emissions in Kane County (34 percent), and on-road mobile sources were a major source of carbon monoxide emissions in the planning area counties (16 percent and 20 percent in Kane and Garfield Counties, respectively). In Kane County, the primary source of sulfur dioxide was wildfires (92 percent), while in Garfield County, there were several major contributors, including oil and gas exploration and development (32 percent), area sources (21 percent), and wildfires (19 percent).

HAPs, also known as toxic air pollutants or air toxics, include 188 pollutants that are known or suspected to cause cancer and noncarcinogenic respiratory effect; other serious health effects, such as reproductive effects or birth defects; and adverse environmental effects. The AirToxScreen<sup>3</sup> Tool, developed by the EPA, shows that in 2019 the total cancer risk from HAPs for Kane and Garfield Counties was 10.74 and 10.16 in a million, respectively (AirToxScreen 2023). These are both below the the upper limit of acceptable risk of 100 in a million lifetime cancer risk for the most exposed person, the 1989 Benzene National Emission Standard for HAPs (AirToxScreen 2023).. The hazard index for noncancer respiratory risks in both Kane and Garfield Counties was 0.02; values below 1.0 indicate that air toxics are unlikely to cause adverse noncancer health effects over a lifetime of exposure (AirToxScreen 2023).

The Clean Air Act seeks to prevent future visibility impairment and to remedy existing visibility impairment in Class I areas, which receive the highest degree of air quality protection under the Act. The air quality analysis area includes the planning area and any Class I areas within 62 miles, which is considered the distance where adverse air quality impacts (including reduced visibility and environmental damage) would occur. These Class I areas are Bryce Canyon, Capitol Reef, and Zion National Parks (NPS 2022a).

Visibility is affected by pollutant concentrations. Visibility on the haziest and clearest days has not changed substantially for Bryce Canyon and Capital Reef National Parks, The 5-year average (2014–2018) visibility for haziest days has improved by 22 percent in Bryce Canyon National Park and by 18 percent in Capitol Reef National Park, compared with the 2000–2004 5-year average (Western Regional Air Partnership 2023a). The clearest days' 2014–2018 5-year average visibility has improved by 47 percent in Bryce Canyon National Park and by 42 percent in Capitol Reef National Park, compared with the 2000–2004 5-year average (Western Regional Air Partnership 2023b). Atmospheric deposition refers to the processes by which air pollutants are removed from the atmosphere and deposited on terrestrial and aquatic

---

<sup>3</sup> <https://www.epa.gov/AirToxScreen/2019-airtoxscreen>

ecosystems and includes nitrogen deposition and sulfur deposition. Nitrogen deposition is calculated by summing the nitrogen portion of wet and dry deposition of nitrogen compounds. The total sulfur deposition is calculated by summing the sulfur portion of wet and dry deposition of sulfur compounds. Total deposition has been measured at Canyonlands National Park from 2011 to 2020 (NPS 2022b). Total nitrogen deposition ranged from 0.7 to 1.7 kilograms per hectare per year between 2011 and 2020. Total nitrogen deposition of 3 kilograms per hectare per year represents the total pollution loading where acidification is unlikely and “below which a land manager can recommend a permit be issued for a new source unless data are available to indicate otherwise” (Fox et al. 1989). The air quality trend at Bryce Canyon National Park does not show substantial change in sulfate concentrations between 2011 and 2020 (NPS 2022b).

The primary trends that affect the air quality in the planning area include increased recreation-related and wildfires emissions, and increased dust emissions due to longer drought conditions, which are exasperated by climate change. Some recreational visitors engage in motorized activities that represent emission sources in addition to the highway vehicles used for transportation. Climate change trends, such as an increase in the size and frequency of wildfires and a potential increase in wind-borne dust emissions exasperated by drought conditions, pose increasing air quality concerns from these pollution sources.

### ***Environmental Consequences***

Refer to **Section F.5**, Air Resources – Air Quality in **Appendix F**, Analytical Framework, for descriptions of the indicators, analysis areas, and assumptions used for the following analysis.

#### *Issue*

- How would proposed management actions and land use allocations contribute to air pollutant emissions and affect air quality and visibility?

#### *Impacts Common to All Alternatives*

Management actions that restrict resource use and minimize surface disturbance reduce particulate matter emissions. Under all alternatives, the BLM would manage activities on public land within air quality standards established by the EPA and Utah Division of Air Quality and no less than any local governments’ air quality standards. BLM management would, at minimum, be consistent with the federal Class II area standards of visibility (regional haze) criteria, and no less than any local governments’ air quality criteria. The BLM would apply mitigation to actions that are shown to exceed ambient air quality standards or adversely affect visibility (regional haze) in the Class I areas. To prevent and reduce air quality impacts from all BLM-authorized activities on BLM-managed lands, the BLM would implement mitigation measures developed on a case-by-case basis through the NEPA or other statutory or regulatory processes. The BLM would evaluate each impact to determine whether it is allowable and acceptable.

Major BLM-authorized activities within GSENM that have the potential to contribute to emissions include travel and transportation management, vegetation management, prescribed fire, and livestock grazing. **Table 3-1** shows the estimated criteria air pollutant and HAP emissions from quantifiable sources in GSENM. HAPs estimates from non-oil and gas-related activities are approximately 10 percent of total VOC emissions. The nature and types of impacts that are common to all alternatives are discussed below. Estimated **annual** emissions are expected to be similar across all alternatives, unless otherwise noted in the analysis presented for the individual alternatives.

**Table 3-1. Annual Air Pollutant Emissions by Source (tons per year)**

| Source                                     | Carbon Monoxide | Nitrogen Oxides | PM <sub>10</sub> * | PM <sub>2.5</sub> | Sulfur Dioxide | VOCs         | HAPs        |
|--|-----------------|-----------------|--------------------|-------------------|----------------|--------------|-------------|
| Livestock grazing                          | 9.03            | 24.76           | 21.71              | 2.63              | 0.02           | 1.18         | 0.12        |
| Prescribed fires and vegetation management | 133.26          | 1.61            | 103.62             | 24.52             | 0.83           | 31.25        | 3.13        |
| Recreation and travel management           | 80.77           | 3.81            | 3,383.55           | 349.58            | 0.20           | 3.54         | 0.13        |
| <b>Total</b>                               | <b>223.06</b>   | <b>30.18</b>    | <b>3,508.87</b>    | <b>376.74</b>     | <b>1.04</b>    | <b>35.97</b> | <b>3.37</b> |

Source: Emissions inventory was prepared via personal communication with BLM staff, which is provided in [Appendix L](#). \* the discrepancy in PM<sub>10</sub> emissions are due inclusion of wind-blown fugitive dust emissions from surface disturbance and vehicles traveling on unpaved roads in Table 3-1, while the NEI county-wide data in Table I-1 ([Appendix I](#)) only includes PM<sub>10</sub> emissions from exhaust.

### Travel Management and Recreation

Motorized travel on unpaved roads and recreational use of OHVs create localized impacts on air quality from fugitive dust emissions. Under all alternatives, the demand for recreation and OHV use is expected to continue growing, resulting in increased travel and associated emissions. All such road construction and maintenance activities would also temporarily (during construction) result in increased concentrations of air pollutants locally; however, all such activities on BLM-managed lands would have appropriate measures (such as dust abatement) as part of the permit or contract to reduce impacts on air quality.

In addition to the direct impacts described above, recreation and travel management can have indirect impacts on air quality from windblown erosion caused by disturbance to vegetation and soils or on unpaved roads and trails. Damage to vegetation and increased soil erosion contributes to an increase in fugitive dust emissions, particularly during dry seasons or under drought conditions.

### Livestock Grazing

Movement of livestock across the planning area would create short-term, localized dust as livestock cross unvegetated surfaces and dirt trails. Grazing can also affect vegetation cover and soil conditions. This could indirectly affect air quality from wind-borne dust generation of disturbed surfaces. However, under proper management any surface disturbance and associated air quality impacts would be reduced, while rangeland restoration projects that increase vegetation cover can reduce fugitive dust from exposed or disturbed surfaces.

Rangeland improvement, construction, and maintenance activities in GSENM also contribute to fugitive dust and criteria air pollutant emissions; these emissions are created from surface disturbance from vehicular travel on unpaved roads and exhaust from vehicles and fuel-burning equipment. Conversely, rangeland improvement projects can reduce potential fugitive dust emission through improved livestock dispersal, which would result in fewer concentration areas and less surface disturbance.

### Fire Management and Vegetation Management

Vegetation management would include a variety of treatment methods, including mechanical and prescribed fire treatments methods. Each of these treatment methods would result in short-term, direct impacts on local air quality through the emission of fugitive dust during vehicular travel on unpaved roads to access the planned vegetation management activity, or prescribed fire smoke, with the greatest emissions occurring from prescribed fire. Treatments that uproot vegetation, such as tilling or harrowing,

could have indirect impacts by exposing soils to windblown erosion, while treatments that reduce vegetation height but leave the roots intact would have a lesser potential for indirect impacts. For a description of different types of mechanical vegetation management and the level of surface disturbance under each method, see **Section 3.3**, Vegetation.

Use of prescribed fires for restoration creates smoke (particulate matter) and other criteria air pollutant and HAP emissions. Prescribed fire is regulated by the State through the Utah Smoke Management Program<sup>4</sup>. This program limits the conditions and timing under which prescribed fire can occur; therefore, complying with these provisions would ensure that prescribed fire treatments would continue to minimize air quality impacts on downwind locations under all alternatives. Over the long term, vegetation management that decreases woody plants and increase grasses and forbs could reduce impacts on air quality from wildfire by decreasing fuel loads, resulting in less area burned and less-intensive fire in areas where these treatments occurred (Jaffe et al. 2020). Maintaining or restoring vegetation communities would have indirect, long-term impacts on the extent that vegetation management creates more resilient vegetation communities that are less prone to wildfire.

#### *Alternative A*

Under the No Action Alternative, particulate matter generation and impacts on air quality from livestock grazing, vegetation management would continue at their current levels, while emissions from increased travel to the planning area would continue to increase. Localized impacts on air quality within the 100 acres open to OHV use (less than 0.1 percent of the planning area) and along designated routes in OHV limited-use areas (99.9 percent of the decision area) would continue and increase over time with the increasing trends in visitation and recreation, as described under *Impacts Common to All Alternatives*.

#### *Alternative B*

Under Alternative B, while overall impacts on air quality in the planning area would be similar to impacts under Alternative A, localized impacts—specifically those from OHV travel—would vary in areas that have different OHV management relative to Alternative A. Under Alternative B, areas open to OHV use would be reduced from 100 acres (under Alternative A) to 0 acres. The portion of GSENM closed to OHV use would increase compared with Alternative A, to include 51 percent of the decision area (see **Table 2-1**). OHV travel in the remainder of GSENM would be limited to designated routes, which have siting criteria in some areas. In areas closed to OHV use, emissions from OHVs would be eliminated. As most visitation is associated with main routes in GSENM, which would remain open, the BLM assumes annual visitation emissions in GSENM would not change in a meaningful way based on OHV closures under the alternatives. Some OHV use is expected to become concentrated in the remaining areas limited to designated use. This would result in increased fugitive dust emissions locally in those areas. Combustion-related emissions associated with travel and transportation management are anticipated to be similar to those described under Alternative A, with emissions increasing with increasing demand.

Nonstructural range improvements with a primary purpose to increase forage for livestock would be prohibited. Only structural and nonstructural improvements consistent with the protection of GSENM objects would be permitted; this would minimize the use of fuel-burning equipment for improvement projects and reduce contributions to criteria pollutant emissions from grazing-related activities.

---

<sup>4</sup> <https://deq.utah.gov/air-quality/smoke-management-program>

Allotments that are not under permit would be made unavailable, further reducing the potential for localized fugitive dust impacts from livestock movement in GSENM.

Impacts from vegetation management activities, particularly impacts from fuel-burning equipment for vegetation management, would be similar to Alternative A. However, because management actions would prioritize landscape-scale restoration under Alternative B, the risk of future uncontrolled wildfires that would contribute large amounts of pollutants to the atmosphere would also be reduced, compared with Alternative A.

#### *Alternative C*

In general, the management of air quality resources under Alternative C, which would emphasize interagency collaboration (See management direction Row 8 and 9 in the Alternatives Matrix in Section 2.4.3.) and minimize the creation and transportation of dust (See management direction Row 11 in the Alternatives Matrix in Section 2.4.3. and BMPs for dust in Appendix C, Section 3), could contribute to improvement of local and regional air quality compared with Alternative A.

Under Alternative C, there would be no areas designated as OHV open use (reduced from 100 acres under Alternative A) and the portion of GSENM closed to OHV use (65percent of the decision area—see **Table 2-1**) would be an increase compared with Alternatives A and B. In the remainder of GSENM, OHV travel would be limited to designated routes, and siting criteria would be identified to ensure resource protection. Emissions from OHVs would be eliminated in areas closed to such use, while localized impacts may increase and be concentrated in limited areas along designated routes.

Under Alternative C, impacts from livestock grazing would be similar to those under Alternative B, which would be an overall reduction, with some local variations, relative to Alternative A.

Under Alternative C, impacts from vegetation management would be similar to Alternative B, which would be an overall reduction through prioritization of landscape-scale restoration for vegetation management and a reduction of the risk of severe wildfires.

#### *Alternative D*

In general, the management of air quality resources under Alternative D, similar to Alternative C, would emphasize interagency collaboration and minimize the creation and transportation of dust, which could contribute to improvement of local and regional air quality compared with Alternative A.

Localized impacts from OHV travel would vary in areas that have different OHV management relative to Alternative A. Under Alternative D, there would be no areas designated as OHV open (reduced from 100 acres under Alternative A) and the portion of GSENM closed to OHV use (77 percent of the decision area—see **Table 2-1**) would be an increase compared with Alternatives A, B, C, and E. Emissions from OHVs would be eliminated in areas closed to such use, while localized impacts may increase and be concentrated in limited areas along designated routes.

Under Alternative D, impacts from livestock grazing would be similar to those under Alternative B, which would be an overall reduction, with some local variations, relative to Alternative A.

Alternative D would prioritize natural processes and could result in increased risk of large wildfires by weakening or defoliating fire-resilient vegetations and increasing potential for growth of fire-prone invasive

grasses like cheatgrass. By limiting suppression tools, Alternative D could also result in less efficient wildfire management, which can result in larger, more complex fires that emit large volumes of particulate matter and other criteria air pollutants.

#### *Alternative E*

In general, the management of air quality resources under Alternative E, similar to Alternative C, would emphasize interagency collaboration and minimize the creation and transportation of dust (see Appendix C, Section 3), which could contribute to improvement of local and regional air quality compared with Alternative A.

Localized impacts from OHV travel would vary in areas that have different OHV management relative to Alternative A. Under Alternative E, there would be no areas designated as OHV open (reduced from 100 acres under Alternative A) and the portion of GSENM closed to OHV use (67 percent of the decision area—see **Table 2-1**) would increase compared with Alternative A. Emissions from OHVs would be eliminated in areas closed to such use, while localized impacts may increase and be concentrated in OHV limited areas along designated routes.

Under Alternative E, impacts from livestock grazing would be similar to Alternative B, which would be an overall reduction, with some local variations, relative to Alternative A.

Under Alternative E, impacts from vegetation management would be similar to Alternative B, which would be an overall reduction through prioritization of landscape-scale restoration for vegetation management and a reduction of the risk of severe wildfires.

#### *Cumulative Impacts*

The air quality cumulative impacts analysis area includes the planning area, Class I areas within 62 miles of GSENM, and the larger regional area of southern Utah. Past and present actions that contribute to criteria air pollutant and HAP emissions include production from the Alton Coal Mine within the KFO administrative boundary, ongoing vegetation maintenance (for example, under transmission lines), road construction and maintenance activities (including gravel extraction), and ongoing rangeland maintenance (for example, pipelines, wells, and water catchment projects). **Currently, the only oil and gas development taking place within the analysis area is from development and production activities in the Upper Valley oil field.** Impacts from these projects are expected to continue and contribute to the cumulative air quality impacts in GSENM. In addition, an increasing trend in recreation (including OHV use) and travel to the area is expected to continue to grow. **Based on modeled projection for 2028, the visibility improvement trend is expected to continue at both locations (Western Regional Air Partnership 2023c).**

The management actions under all alternatives would contribute to short-term cumulative effects from surface-disturbing activities, particularly during concurrent project activities nearby, specifically those that result in fugitive dust emissions. Over the long term, Alternatives B, C, and E would have countervailing effects through proactive vegetation management and fire management, which is expected to reduce the risk of large, uncontrolled wildfires that contribute significantly to local and regional air quality. Less-proactive vegetation and fire management under Alternative D would result in potentially large impacts from wildfires, which, when added to past, present, and reasonably foreseeable future actions, would result in the largest cumulative impacts among Alternatives B, C, D, and E.



### 3.1.2 Climate Change (Including Greenhouse Gases)

#### **Affected Environment**

##### *Current Conditions*

The planning area is in the southern portion of the Colorado Plateau ecoregion. It is classified as semiarid, with an annual precipitation range of 10 inches at the mid- and lower elevations to 20 inches above 8,000 feet. Peak precipitation occurs primarily in the winter and again during a distinct wet period in the summer. Summer precipitation periods are characterized by intermittent but often intense monsoonal storms from southern weather patterns (Bryce et al. 2012). Temperatures vary at lower elevations from 20–25 degrees Fahrenheit (°F) in the winter to 95°F in the summer, and at mid- and upper elevations from single digits and low teens in the winter to the low 60s and 70s (in °F) in the summer (Bryce et al. 2012).

Climate change is defined by the Intergovernmental Panel on Climate Change (IPCC) as a long-term change in the state of the climate by changes in the mean and/or the variability of its properties such as temperature and precipitation (IPCC 2023). Within the Southwest region of the United States, the average annual temperature increased 1.6°F between 1901 and 2016. The region recorded more warm nights and fewer cold nights between 1990 and 2016, including an increase of 4.1°F for the coldest day of the year (Gonzalez et al. 2018). Temperatures in Utah have risen more than 2.5°F since the beginning of the twentieth century. The period since 2012 has been the warmest on record for Utah, with 8 of the 10 warmest recorded years. The highest number of extremely hot days in the historical record occurred during 2000–2004. The state has experienced a dramatic increase in the number of very warm nights and a decrease in the number of very cold nights.

As the state has warmed, the percentage of precipitation falling as snow during the winter has decreased, as have snow depth and snow cover (Frankson et al. 2022). April 1st snowpack across the state has gradually decreased in the past 40 years, with the 2011–2020 average statewide snowpack approximately 20 percent lower than that observed between 1981 and 1990. Since snowmelt from the snowpack provides water for many river basins, abnormally low winter and spring precipitation is often the trigger for drought conditions (BLM 2022).

Human activities, principally through emissions of greenhouse gases (GHGs), have unequivocally caused current global temperature to increase by 2°F over the past century. GHGs impact global climate by trapping heat in the atmosphere. The primary GHGs produced by human activities include carbon dioxide, methane, and nitrous oxide.

#### **Environmental Consequences**

Refer to **Section F.6**, Air Resources – Climate Change in **Appendix F**, Analytical Framework, for descriptions of the indicators, analysis areas, and assumptions used for the following analysis.

##### *Issues*

- What would be the expected contribution to GHG emissions from proposed management?
- How would proposed management affect long-term carbon storage and sequestration in GSENM?

*Impacts Common to All Alternatives*

**Greenhouse Gas Emissions**

Major BLM-authorized activities within GSENM that have the potential to impact GHG concentrations include livestock grazing operations, travel and transportation management, visitation, and prescribed fire and vegetation management. The impact analysis is based on a quantitative assessment of GHG emissions from these activities, where available, and a qualitative analysis of the effects of these emissions on climate change.

**Table 3-2**, below, shows the estimated annual GHG emissions from quantifiable sources in GSENM. Estimated emissions are expected to be similar across the alternatives, unless otherwise noted in the analysis presented for the individual alternatives.

**Table 3-2. Annual Greenhouse Gas Emissions by Source (metric tonnes per year)**

| Source                                     | Carbon Dioxide | Methane      | Nitrous Oxide | AR6 100-Year CO <sub>2</sub> e* | AR6 20-Year CO <sub>2</sub> e** |
|--|----------------|--------------|---------------|---------------------------------|---------------------------------|
| Livestock grazing                          | 3,907          | 4,584        | 0.05          | 140,537                         | 382,138                         |
| Prescribed fires and vegetation management | 1,284          | 6            | 0.82          | 1,678                           | 1,977                           |
| Recreation and travel management           | 27,974         | 1            | 0.52          | 28,159                          | 28,236                          |
| <b>Total</b>                               | <b>33,165</b>  | <b>4,591</b> | <b>1.39</b>   | <b>170,374</b>                  | <b>412,351</b>                  |

Source: Emissions inventory was prepared via personal communication with BLM staff, which is provided in [Appendix L](#).

\*100-year time horizon global warming potentials applied are carbon dioxide = 1; methane = 29.8; nitrogen dioxide = 273, from the IPCC Sixth Assessment Report (AR6; IPCC 2021).

\*\*20-year time horizon global warming potentials applied are carbon dioxide = 1; methane = 82.5; nitrogen dioxide = 273, from the IPCC Sixth Assessment Report (AR6; IPCC 2021).

When applying the 100-year global warming potentials from the IPCC AR6, the average annual estimated CO<sub>2</sub>e from quantifiable emission-generating activities in GSENM comprise approximately 0.24 percent of Utah’s total GHG emissions of 72 megatonnes of CO<sub>2</sub>e in 2020, and 0.003 percent of U.S. emissions of 5,586 megatonnes of CO<sub>2</sub>e in 2021 (EPA 2023). When applying the 20-year global warming potentials from the IPCC AR6, emissions from quantifiable emission-generating activities in GSENM comprise approximately 0.49 percent of Utah’s total 84 megatonnes of CO<sub>2</sub>e in 2020, and 0.005 percent of U.S. emissions of 7,634 megatonnes of CO<sub>2</sub>e in 2021.

The primary difference in quantifiable GHG emissions by alternative is due to differences in livestock grazing AUMs. GHG emissions from other quantified uses are not expected to vary substantially across the alternatives. Differences in GHG emissions from livestock grazing are described under each alternative.

**Travel Management and Recreation.** Emissions from on-road and off-road vehicles would be a primary source of GHG emissions in GSENM under all alternatives. Direct GHG impacts from recreation and travel management in GSENM include exhaust emissions from vehicles, OHVs (including ATVs/UTVs and motorcycles), and fuel-burning equipment involved in road and facility maintenance and construction projects. Under all alternatives, recreation demand and OHV use is expected to continue growing, resulting in increased recreation and travel-related GHG emissions. Improvements in fuel standards and

composition, and an increasing trend in use of electric vehicles, are expected to offset emissions over time.

Recreation and travel can also result in vegetation loss and soil disturbance (see **Section 3.2**, Soil Resources, and **Section 3.3**, Vegetation) that release carbon into the atmosphere. This effect would be limited because OHV use would be closed or limited to designated routes throughout GSENM under all action alternatives [which limits the potential for vegetation loss and new soil disturbance](#).

**Livestock Grazing.** Livestock grazing, specifically methane emissions from enteric fermentation and manure deposition (Kauffman et al. 2022), is the dominant source of GHGs in GSENM due to the stronger radiative forcing of methane, as represented by its higher global warming potential. Emissions of methane from livestock grazing comprise over 99 percent of quantifiable GHG emissions in GSENM. Other potential impacts of livestock grazing that can impact climate change include spread of noxious weeds and plants, as well as the reduction in soil nutrient contents, which exasperate carbon storage and climate change impacts. Conversely, sustainable livestock grazing can have beneficial effects by reducing fuel loads and improving soil conditions and biological diversity. Grazing, under improved management [such as low utilization rates](#), can increase carbon sequestration potential of the soil and promote root production(Chen et al. 2015).

The net impact of BLM management and allocations in GSENM on carbon stocks is difficult to quantify due to a relative lack of site-specific studies.

**Fire Management and Vegetation Management.** Prescribed fire and vegetation management in GSENM would emit GHGs under all alternatives. In addition to GHG emissions from the combustion of woody materials in prescribed fires, other sources of GHGs include fuel-burning equipment, such as hand-held chainsaws, off-road heavy equipment (such as masticators, dozers, or tractors), aircraft for seeding, and on-road commuting vehicles used by staff to travel to the project site or transport material.

Under all alternatives, proper fire and vegetation management can help maintain native plants that allow longer periods between wildfire, which would reduce the risk of wildfire (Ypsilantis et al. 2003; also see **Section 3.3**, Vegetation, and **Section 3.13**, Fire and Fuels Management). Prescribed burns would emit substantially less GHGs than wildfires (Wiedinmyer and Hurteau 2010).

With respect to carbon storage and sequestration, while prescribed fires and some vegetation management would reduce carbon storage in GSENM in the short term, vegetation management and prescribed fires are expected to reduce the risk of uncontrolled wildfires that would impact larger areas and result in much greater loss of stored carbon in the long term. Under all alternatives, while prescribed fires would reduce carbon storage temporarily in GSENM, in the long term they would [likely](#) result in an increased carbon storage capacity in GSENM.

#### *Alternative A*

Under the No Action Alternative, grazing of up to 107,995 AUMs would result in the grazing-related GHG emissions described in **Table 3-2**. Under current management, creation of new nonstructural range improvements (in the absence of other designation) and any emissions that would result (from burning fossil fuels) would also continue. [Alternative A management would continue not to implement range improvements for the primary purpose of increasing forage for livestock, and the need for and extent of](#)

range improvements would continue to be considered on a case-by-case basis and in conformance with the current RMP objectives and actions.

Under the No Action Alternative, with current guidance to use the full range of vegetation management methods and tools to prioritize wildlife habitat, forage, and land health, carbon storage and sequestration rates in GSENM would continue at current levels. There would be no ACECs under this alternative, and lands with wilderness characteristics would not receive any special management to protect naturalness under current management. This could impact carbon storage in GSENM indirectly where a lack of protection of resources could contribute to a decrease in long-term carbon sequestration in GSENM.

#### *Alternative B*

Under Alternative B, a 2.7 percent reduction in allocated AUMs compared with Alternative A, would result in an annual grazing-related GHG emissions in GSENM equal to 136,684 metric tonnes of 100-year time horizon CO<sub>2</sub>e and 371,660 metric tonnes of 20-year time horizon CO<sub>2</sub>e (2.7 percent less), from emission of GHGs from quantifiable sources in GSENM. Under this alternative, nonstructural range improvements with the primary purpose of increasing forage for livestock would not be allowed. Also, the BLM would permit improvements only if they are consistent with the protection of GSENM objects; therefore, fewer rangeland construction and maintenance projects would be expected under this alternative, compared with Alternative A, resulting in a decrease in overall GHG emissions from such sources.

Active vegetation management under Alternative B is intended to make vegetation climate resilient such that it continues to remain healthy and diverse. As described in **Section 3.13**, Fire and Fuels Management, this would result in more frequent, less severe fires that would increase the acres burned than Alternative A and increase the potential for long-term carbon storage and sequestration in GSENM. Management actions and allocations under this alternative would include the addition of special designation areas; conducting landscape-scale restoration projects intended to restore functional vegetation communities, including some lands with wilderness characteristics to be managed to protect such characteristics; and limiting surface-disturbing activities such as rangeland improvements and OHV use. These actions would improve the carbon storage potential in GSENM.

#### *Alternative C*

Alternative C, with the same 2.7 percent reduction in AUMs relative to Alternative A, would result in the same impacts as Alternative B from annual grazing-related GHG emissions in GSENM (136,684 metric tonnes of 100-year time horizon CO<sub>2</sub>e and 371,660 metric tonnes of 20-year time horizon CO<sub>2</sub>e). All other impacts, including the potential for long-term carbon storage in GSENM, would be the same as those described under Alternative B.

Similar to Alternative B, active vegetation management under Alternative C is intended to make vegetation climate resilient such that it continues to remain healthy and diverse, which would increase the potential for long-term carbon storage and sequestration in GSENM. Beneficial impacts would be even greater than those that are expected under Alternative B, due to even greater protective measures for resources under this alternative.

#### *Alternative D*

Under Alternative D, with a 59.3 percent reduction in allocated AUMs compared with Alternative A, would result in an annual grazing-related GHG emissions in GSENM equal to 58,882 metric tonnes of 100-year time horizon CO<sub>2</sub>e and 160,109 metric tonnes of 20-year time horizon CO<sub>2</sub>e from quantifiable sources in GSENM.

Alternative D would prioritize natural processes by minimizing active management. Carrying out fewer acres of treatments would mean a continued increased risk of severe fires, which typically result in extensive loss of carbon storage and sequestration. As a result, while higher protective measures under Alternative D would result in increased potential for carbon sequestration in GSENM, compared with Alternative A, impacts of prioritizing natural processes could have the opposite effect due to the increased risk of large wildfires and the weakening or defoliating of desirable vegetations, which would reduce GSENM's potential for carbon storage.

#### *Alternative E*

Alternative E, with a 2.8 percent reduction in allocated AUMs compared with Alternative A, would result in annual grazing-related GHG emissions in GSENM equal to 136,614 metric tonnes of 100-year time horizon CO<sub>2</sub>e and 371,469 metric tonnes of 20-year time horizon CO<sub>2</sub>e. All other impacts, including the potential for long-term carbon storage in GSENM, would be the same as those described under Alternative B.

Similar to Alternative C, active vegetation management under Alternative E is intended to make vegetation climate resilient such that it continues to remain healthy and diverse, which would increase the potential for long-term carbon storage and sequestration in GSENM.

#### *Cumulative Impacts*

Past and present actions that contribute to GHG emissions include production from the Alton Coal Mine within the KFO's administrative boundaries, ongoing vegetation maintenance, road construction, and ongoing rangeland maintenance projects that use fuel-burning equipment. Currently, the only oil and gas development taking place within the analysis area is from development and production activities in the Upper Valley oil field. Impacts from these projects are expected to continue and contribute to the cumulative GHG emissions in GSENM. In addition, an increasing trend in recreation (including OHV use) and travel to the area is expected to continue growing, contributing further to GHG emissions from vehicles. Improvements in fuel standards and composition, and an increasing trend in use of electric vehicles, is expected to offset emissions over time.

In Utah, global climate models estimate a temperature increase of 2.0°F to 5.0°F under a low-emission scenario and as much as 15.0°F under a high-emission scenario. Projected rising temperatures will result in reduced water storage in the snowpack, particularly at lower elevations. In addition, extreme precipitation is projected to increase, potentially increasing the frequency and intensity of floods (BLM 2022).

The long-term potential for climate change in GSENM ranges from moderate-low to very high. The southern portions of GSENM compose the largest area with very high potential for climate change. The Escalante Canyons area shows moderate-low to moderate potential for long-term change. The

Kaiparowits area shows mostly moderate potential with some areas of moderate-low, moderate-high, and very high potential (BLM 2018).

The No Action Alternative would continue to contribute to the cumulative GHG emissions from transportation, vegetation, and livestock grazing management activities that use fuel-burning equipment. The No Action Alternative would further contribute to the cumulative GHG emissions from enteric fermentation of manure from livestock grazing, which would likely increase in the foreseeable future, as the suspended AUMs would be reactivated over time.

Similar to the No Action Alternative, management actions under Alternatives B, C, D, and E would also contribute to cumulative GHG emissions from management activities that require fuel-burning equipment and from the projected increased travel to the area. In the long term, Alternatives B, C, D, and E would have countervailing effects from a reduction in AUMs in GSENM, vegetation management, and fire management, which is expected to reduce the risk from large, uncontrolled wildfires that contribute significantly to GHG emissions.

#### Social Cost of Greenhouse Gas Emissions

The social cost of carbon, social cost of nitrous oxide, and social cost of methane—together, the social cost of greenhouse gases (SC-GHG)—are estimates of the monetized damages associated with incremental increases in GHG emissions in a given year. It includes the estimated value of all climate change impacts, including but not limited to public health effects, changes in net agricultural productivity, property damage from increased flood risk, natural disasters, disruption of energy systems, risk of conflict, environmental migration, and the value of ecosystem services (U.S. Interagency Working Group on the Social Cost of Greenhouse Gases [IWG] 2021).

On January 20, 2021, President Biden issued Executive Order 13990, Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis.<sup>5</sup> Section 1 of Executive Order 13990 establishes an administration policy to, among other things, listen to the science; improve public health and protect our environment; ensure access to clean air and water; reduce GHG emissions; and bolster resilience to the impacts of climate change.<sup>6</sup> Section 2 of the order calls for federal agencies to review existing regulations and policies issued between January 20, 2017, and January 20, 2021, for consistency with the policy articulated in the order and to take appropriate action.

Consistent with Executive Order 13990, the Council on Environmental Quality (CEQ) rescinded its 2019 “Draft National Environmental Policy Act Guidance on Considering Greenhouse Gas Emissions” and has issued interim NEPA Guidance on Consideration of Greenhouse Gas Emissions and Climate Change and is seeking public comment through April 10, 2023<sup>7</sup>. The CEQ is issuing this guidance as interim guidance so that agencies may make use of it immediately while CEQ seeks public comment on the guidance. The CEQ intends to either revise the guidance in response to public comments or finalize the interim guidance. GHG guidance, effective upon publication, builds upon and updates CEQ's 2016 Final Guidance for Federal

---

<sup>5</sup> 86 Federal Register 70307 (Jan. 25, 2021)

<sup>6</sup> Id., Sec. 1

<sup>7</sup> Federal Register: National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change

Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews.

Regarding the use of social cost of carbon or other monetized costs and benefits of GHGs, the 2016 GHG Guidance noted that NEPA does not require monetizing costs and benefits. It also noted that “the weighing of the merits and drawbacks of the various alternatives need not be displayed using a monetary cost-benefit analysis and should not be when there are important qualitative considerations.”

Section 5 of Executive Order 13990 emphasized how important it is for federal agencies to “capture the full costs of greenhouse gas emissions as accurately as possible, including by taking global damages into account” and established the IWG.<sup>8</sup> In February 2021, the IWG published Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide: Interim Estimates under Executive Order 13990 (IWG 2021). This is an interim report that updated previous guidance from 2016.

In accordance with this direction, this subsection provides estimates of the monetary value of changes in GHG emissions that could result from selecting each alternative. Such analysis should not be construed to mean a cost determination is necessary to address potential impacts of GHGs associated with specific alternatives. These numbers were monetized; however, they do not constitute a complete cost-benefit analysis, nor do the SC-GHG numbers present a direct comparison with other impacts analyzed in this document. SC-GHG is provided only as a useful measure of the benefits of GHG emissions reductions to inform agency decision-making.

For federal agencies, the best currently available estimates of the SC-GHG are the interim estimates of the social cost of carbon dioxide, methane, and nitrous oxide developed by the IWG on the SC-GHG. Select estimates are published in the IWG’s technical support document (IWG 2021), and the complete set of annual estimates is available on the Office of Management and Budget’s website<sup>9</sup>. The IWG’s SC-GHG estimates are based on complex models describing how GHG emissions affect global temperatures, sea level rise, and other biophysical processes; how these changes affect society through, for example, agricultural, health, or other effects; and monetary estimates of the market and nonmarket values of these effects. One key parameter in the models is the discount rate, which is used to estimate the present value of the stream of future damages associated with emissions in a particular year. A higher discount rate assumes that future benefits or costs are more heavily discounted than benefits or costs occurring in the present (that is, future benefits or costs are a less significant factor in present-day decisions). The current set of interim estimates of SC-GHG have been developed using three different annual discount rates: 2.5 percent, 3 percent, and 5 percent (IWG 2021).

As expected with such a complex model, there are multiple sources of uncertainty inherent in the SC-GHG estimates. Some sources of uncertainty relate to physical effects of GHG emissions, human behavior, future population growth and economic changes, and potential adaptation (IWG 2021). To better understand and communicate the quantifiable uncertainty, the IWG method generates several thousand estimates of the social cost for a specific gas, emitted in a specific year, with a specific discount rate. These estimates create a frequency distribution based on different values for key uncertain climate model

---

<sup>8</sup> Executive Order 13990, Sec. 5.

<sup>9</sup> <https://www.whitehouse.gov/omb/information-regulatory-affairs/regulatory-matters/#scghgs>

parameters. The shape and characteristics of that frequency distribution demonstrate the magnitude of uncertainty relative to the average or expected outcome.

To further address uncertainty, the IWG recommends reporting four SC-GHG estimates in any analysis. Three of the SC-GHG estimates reflect the average damages from the multiple simulations at each of the three discount rates. The fourth value represents higher-than-expected economic impacts from climate change. Specifically, it represents the 95th percentile of damages estimated, applying a 3 percent annual discount rate for future economic effects. This is a low probability, but high damage scenario, that represents an upper bound of damages within the 3 percent discount rate model. The estimates below follow the IWG recommendations.

The SC-GHGs associated with estimated emissions from quantified GHG emission sources in GSENM are shown in **Table 3-3** to **Table 3-7**. These estimates represent the present value of future market and nonmarket costs associated with carbon dioxide, methane, and nitrous oxide emissions. Estimates are calculated based on IWG estimates of social cost per metric tonne of emissions for a given emissions year and BLM’s estimates of emissions in each year. The estimates assume a base year of 2022, with emissions under the RMP running from 2023 through 2045. Values have been rounded to the nearest \$1000.

**Table 3-3. SC-GHG Associated with Estimated Emissions from BLM Activities under Alternative A**

| <b>Emission</b>  | <b>Average, 5%</b> | <b>Average, 3%</b> | <b>Average, 2.5%</b> | <b>95<sup>th</sup> Percentile, 3%</b> |
|------------------|--------------------|--------------------|----------------------|---------------------------------------|
| CO <sub>2</sub>  | 9,244,000          | 35,438,000         | 53,764,000           | 107,655,000                           |
| CH <sub>4</sub>  | 63,003,000         | 159,907,000        | 215,379,000          | 426,007,000                           |
| N <sub>2</sub> O | 157,000            | 553,000            | 833,000              | 1,469,000                             |
| <b>Total</b>     | <b>72,404,000</b>  | <b>195,898,000</b> | <b>269,976,000</b>   | <b>535,131,000</b>                    |

Source: Calculated using social cost per tonne from IWG 2021 and the BLM’s estimates of emissions under each alternative

**Table 3-4. SC-GHG Associated with Estimated Emissions from Other BLM Activities under Alternative B**

| <b>Emission</b>  | <b>Average, 5%</b> | <b>Average, 3%</b> | <b>Average, 2.5%</b> | <b>95<sup>th</sup> Percentile, 3%</b> |
|------------------|--------------------|--------------------|----------------------|---------------------------------------|
| CO <sub>2</sub>  | 9,222,000          | 35,352,000         | 53,632,000           | 107,390,000                           |
| CH <sub>4</sub>  | 61,713,000         | 156,518,000        | 210,784,000          | 416,959,000                           |
| N <sub>2</sub> O | 157,000            | 553,000            | 832,000              | 1,467,000                             |
| <b>Total</b>     | <b>71,092,000</b>  | <b>192,423,000</b> | <b>265,248,000</b>   | <b>525,816,000</b>                    |

Source: Calculated using social cost per tonne from IWG 2021 and the BLM’s estimates of emissions under each alternative

**Table 3-5. SC-GHG Associated with Estimated Emissions from Other BLM Activities under Alternative C**

| <b>Emission</b>  | <b>Average, 5%</b> | <b>Average, 3%</b> | <b>Average, 2.5%</b> | <b>95<sup>th</sup> Percentile, 3%</b> |
|------------------|--------------------|--------------------|----------------------|---------------------------------------|
| CO <sub>2</sub>  | 9,222,000          | 35,352,000         | 53,632,000           | 107,390,000                           |
| CH <sub>4</sub>  | 61,713,000         | 156,518,000        | 210,784,000          | 416,959,000                           |
| N <sub>2</sub> O | 157,000            | 553,000            | 832,000              | 1,467,000                             |
| <b>Total</b>     | <b>71,092,000</b>  | <b>192,423,000</b> | <b>265,248,000</b>   | <b>525,816,000</b>                    |

Source: Calculated using social cost per tonne from IWG 2021 and the BLM’s estimates of emissions under each alternative



**Table 3-6. SC-GHG Associated with Estimated Emissions from Other BLM Activities under Alternative D**

| Emission         | Average, 5%       | Average, 3%        | Average, 2.5%      | 95 <sup>th</sup> Percentile, 3% |
|------------------|-------------------|--------------------|--------------------|---------------------------------|
| CO <sub>2</sub>  | 8,777,000         | 33,599,000         | 50,958,000         | 102,042,000                     |
| CH <sub>4</sub>  | 35,671,000        | 88,088,000         | 118,002,000        | 234,267,000                     |
| N <sub>2</sub> O | 154,000           | 544,000            | 819,000            | 1,445,000                       |
| <b>Total</b>     | <b>44,602,000</b> | <b>122,231,000</b> | <b>169,779,000</b> | <b>337,754,000</b>              |

Source: Calculated using social cost per tonne from IWG 2021 and the BLM's estimates of emissions under each alternative

**Table 3-7. SC-GHG Associated with Estimated Emissions from Other BLM Activities under Alternative E**

| Emission         | Average, 5%       | Average, 3%        | Average, 2.5%      | 95 <sup>th</sup> Percentile, 3% |
|------------------|-------------------|--------------------|--------------------|---------------------------------|
| CO <sub>2</sub>  | 9,222,000         | 35,350,000         | 53,629,000         | 107,385,000                     |
| CH <sub>4</sub>  | 61,690,000        | 156,456,000        | 210,700,000        | 416,794,000                     |
| N <sub>2</sub> O | 157,000           | 553,000            | 832,000            | 1,467,000                       |
| <b>Total</b>     | <b>71,069,000</b> | <b>192,359,000</b> | <b>265,161,000</b> | <b>525,646,000</b>              |

Source: Calculated using social cost per tonne from IWG 2021 and the BLM's estimates of emissions under each alternative

As shown in **Table 3-3** to **Table 3-7**, Alternative A would result in the highest value of SC-GHG from quantifiable sources in GSENM (\$196 million at 3 percent discount rate). The total SC-GHG estimated for the period between 2023 to 2045 at the 3 percent discount rate under Alternative A would be reduced by 2 percent under Alternatives B, C, and E, and by 38 percent under Alternative D. The changes in the SC-GHG relate to projected differences in AUMs under each alternative.

## 3.2 SOIL RESOURCES

### 3.2.1 Affected Environment

#### Current Conditions

Soils in the decision area are typically semiarid, young, and relatively undeveloped. They are characterized by slow physical, chemical, and biological processes (such as rock weathering and nutrient cycling) and rapid erosion. Most soils in the decision area are shallow, ranging from 2 to 20 inches in depth, and are formed primarily from sedimentary rock and dominant topographic features that consist of structural benches, mesas, valley floors and plains, and alluvial fans (U.S. Department of Agriculture, Natural Resources Conservation Service [NRCS] 2023). Dominant soil orders in the decision area are Aridisols (212,800 acres), Entisols (1,445,300 acres), and Alfisols (89,600 acres). The decision area contains soils with special characteristics that may limit their suitability for certain management activities (Bryce et al. 2012). These include soils that are droughty, shallow, highly erodible, highly saline, hydric, and/or gypsiferous. Most of the decision area that has been mapped for Site Degradation Susceptibility Rating falls within the “highly susceptible” category (55 percent) and “moderately susceptible” category (30 percent) (NRCS 2023). Additionally, biological soil crusts consisting of cyanobacteria, moss, and lichen play crucial roles in soil stabilization, nutrient cycling, and carbon sequestration. Such crusts are useful indicators of desert conditions as they are vulnerable to disturbance. Biological soil crusts are ubiquitous within the decision area.

### **Trends**

Persistent wind and water erosion typical of desert ecosystems is exacerbated by human activities such as mining, recreation, unauthorized OHV use, and livestock grazing, which disturb protective crusts and expose underlying soils to erosion. To assess landscape and soil health within watersheds, terrestrial assessment, inventory, and monitoring (AIM) data was analyzed and found to indicate degraded soil health across the planning area, with varying amounts of degradation observed throughout the decision area. Areas where bare ground cover is decreasing are primarily in the western portions of GSENM, while areas where bare ground cover is increasing are concentrated in the northern, eastern, and scattered in the southwest portions of the decision area (**Figure 18, Appendix B**, bare ground cover trend). The distribution of cyanobacteria crust stability index (based on data from 2000 to 2003) shows two areas of lower crust stability within the northeastern and southwestern portions of GSENM (**Figure 3-10, Appendix A**). Lichen cover is higher in the southern portion of GSENM, and moss cover is lower within the central and southern portions of GSENM. These patterns suggest certain areas within the planning area may be more vulnerable to disturbance and may need additional protection measures to minimize impacts on biocrust cover within these vulnerable areas. Data show decreased litter cover across the planning area with a few areas of higher litter cover in the northern portion of GSENM. Two watersheds in the southwestern portion of the planning area exhibit overall lower soil degradability than the rest of the planning area. Overall, of the 16 HUC 10 watersheds within GSENM all were above 30% total litter cover (see **Table 9, Appendix B** for details), and all 16 measured watersheds show 3 percent average soil stability, with the highest mean value being in Sheep Creek for soil stability (see **Table 14, Appendix B**). Full soil parameter descriptive statistics are presented throughout **Appendix B**.

### **Forecasts**

The BLM expects human activities to continue to disturb soil surfaces, thereby affecting soil surface conditions and biological soil crusts and exposing underlying soils to wind and water erosion. Climate change is expected to create an amplified hydrological cycle, with extreme cycles of drought and heavy precipitation that will impact soil water availability, soil productivity, **biological soil crusts**, vegetation communities, fire regimes, and wind and water erosion.

Vegetation communities are expected to be strongly impacted by climate change, increased frequency and intensity of fires, insect and disease outbreaks, weed infestations, and ongoing drought conditions. Some vegetation communities are projected to drastically change in response to these changes, including shifts in evergreen forests and expansion of grassland communities in some areas. Any dramatic shifts in vegetation community structure, as would occur in responses to catastrophic fires and landslides, would be accompanied by soil instability and erosional losses until landscapes reach equilibrium under new vegetation communities.

### **3.2.2 Environmental Consequences**

Refer to **Section F.7**, Soil Resources, in **Appendix F**, Analytical Framework, for descriptions of the indicators, analysis areas, and assumptions used for the following analysis.

### **Issues**

- How would proposed management affect biological soil crusts?
- How would proposed management affect vulnerable soils?
- How would proposed management affect soil health and ecological function?

### **Impacts Common to All Alternatives**

Several management actions are anticipated to have impacts on soil resources, which are discussed below. Actions that could impact soil resources include ground-disturbing activities associated with ROWs granted; recreation, including camping, hiking, OHV use, and mountain biking; special land use designations; livestock grazing; and vegetation and forest management.

Land management actions, including activities associated with land management actions (for example, ROW development and special land use designations, recreation management, livestock grazing, and vegetation and forest management), would directly and indirectly impact soil resources within the decision area. Ground-disturbing and vegetation removal activities would increase the potential for loss or impairment of soil structure and function and the susceptibility of soils to wind and water erosion. Associated impacts could include soil compaction, loss or displacement of topsoil or protective soil surface features (for example, biotic soils), mixing of soil horizons, decreased soil stability, increased mass wasting potential, nutrient cycling and ratio impacts, and interference with natural hydrologic properties (for example, infiltration, runoff, and gas exchange). The loss of natural soil structure and function can create a feedback loop that further compounds losses of native vegetation, topsoil, and soil productivity through time.

Impacts from ground-disturbing activities on soil resources may be mitigated through applicable stipulations or measures that address site-specific environmental concerns. Restorative activities conducted in disturbed areas, including reclamation or restoration of natural soil surface or subsurface features, vegetation and forest communities, and geomorphology, have the potential to improve soil ecological function and prevent further soil loss or degradation.

Vulnerable soils are generally more susceptible to ground-disturbing activities with amplified impacts from surface disturbance. Biological soil crusts are fragile and extremely susceptible to physical disruption from foot traffic, grazing, OHVs, and mechanized equipment, which destabilize surface soils. Biological soil crusts remain challenging to restore (Chiquoine et al. 2016). All alternatives would, [at a minimum, protect](#) areas of biological soil crust appropriate for the soil type, climate, and landform. Additionally, all alternatives would aim to facilitate appropriate research to improve understanding and management of soil resources and biological soil crusts.

Under all management alternatives, and on lands managed under the GSENM RMPs (BLM 2020a) and the KEPA RMP (BLM 2020b), procedures to protect soils from accelerated or unnatural erosion from any ground-disturbing activity, including route maintenance and restoration, would be applied.

The impacts of management activities on soil resources vary based on the nature and magnitude of ground disturbance or restorative action and the legacy impacts from previous land use. The following sections summarize the expected impacts of foreseeable management actions and associated activities.

### **Land Management Actions**

#### *Lands and Realty*

Land allocations within the decision area would [guide](#) the compatible land use and ROW authorizations that would ultimately determine potential impacts on soil resources. Activities associated with areas that are open to ROWs or that are managed as ROW avoidance areas that could impact decision area soils include, but are not limited to, construction of roads, facilities, and structures; vegetation removal or

manipulation; overland travel or trampling; vehicle use in authorized areas; grading; and excavation. Activities associated with land allocations would impact soils due to vegetation removal that may increase susceptibility to erosion, soil compaction, and topsoil removal as a result of grading and excavation.

Generally for land allocations, the greater the size of the area and/or the more ground-disturbing activities that are authorized, the greater the potential impact on soil resources from authorized activities that may include vegetation removal, soil excavation, and construction of facilities. Ground disturbance associated with authorized activities also could lead to soil erosion, disturbance of natural soil surface features, and the loss of soil productivity.

Areas that remain or become ROW exclusion areas would be subject to the fewest potential ground-disturbing activities that would impact soil resources. Areas that remain or become ROW avoidance areas would have greater potential for future soil resource impacts resulting from ground disturbance than exclusion areas. Areas that remain or become open to ROW authorization have the greatest potential for ground-disturbing activities that could impact soil resources. Ground-disturbing activities would be expected to have a greater level of impact on vulnerable soils and biological soil crusts than non-vulnerable soil types. Likewise, areas identified as having a moderate or high soils degradation susceptibility rating ([Appendix I, Table I-3](#)) are expected to have low resilience to impacts from ground disturbance. Management actions that could protect soils from accelerated or unnatural erosion by ground-disturbing and land status activity within authorized ROWs and land allocations include U.S. Department of the Interior and BLM Management of Land Boundaries boundary evidence risk assessment policies and guidance.

#### *Recreation Management*

Recreation can cause localized impacts on soil resources and indirect impacts across the landscape. For example, hiking, mountain biking, dispersed camping, overlanding (a blend of car camping and OHV-type use), and OHV use may cause soil compaction, vegetation trampling, habitat fragmentation, increased weed invasion, and greater susceptibility to soil erosion. As hiking and camping (including dispersed camping and overlanding) become more popular, trail and campsite widening can occur, magnifying erosion and increasing the area and depth of soil disturbance. Generally, hiking and mountain bike trail use are localized with impacts on soil resources limited to trailside areas. Informal user trails, side-country networks, and dispersed human impacts can occur; these can result in increased impacts on soil resources.

Similar to camping and mountain biking, the use of OHV on public lands can expand beyond authorized and managed areas and result in increased soil resource impacts. Without adherence to established routes, OHV use has the potential to lead to faster and greater vegetation and soil disturbance than hiking and mountain biking; this is because of OHV weight, size, and travel speed. Dispersed camping and overlanding have a higher likelihood of impacting soil resources due to uninformed travel outside designated camping areas and beyond established OHV routes.

Three types of travel management designations have been defined with variable levels of potential soil disturbance. Areas that are closed to OHV travel would have no authorized OHV-related soil impacts. Areas where OHV travel is limited to designated routes would have some soil impacts, but those impacts would be limited to designated routes where disturbance has occurred previously. Areas that are open to OHV travel would generally allow unrestricted OHV use; however, those areas would avoid previously

undisturbed soils and would limit soil impacts on a confined area where soil resource impacts have occurred previously.

Special designation areas, including WSAs, and ACECs, would generally have protective impacts on soil resources compared with areas that lack special designation. ACECs would be managed according to their respective management plans but would generally have some restrictions on ground-disturbing activities that would destabilize soils or decrease soil productivity.

### **Livestock Grazing Management**

Livestock grazing management has the potential to cause impacts on soil resources. The level of impacts would depend on the intensity of grazing, range site potential, local climate and weather conditions, and the seasonal timing of use (Abdalla et al. 2018, Pouyat et al. 2020). Depending on site conditions and methods, grazing can cause reduced biological soil crust and vegetation cover, declines in soil health, and compaction (Neff et al. 2005, Pouyat et al. 2020). Construction of rangeland improvements would cause ground disturbance and potential compaction or displacement of soils. Vulnerable soils and biological soil crusts would generally be more susceptible to physical impacts from livestock trampling or rangeland improvement construction activities. However, rangeland improvement treatment completed through funding from grazing programs aimed to improve vegetation communities could positively impact/improve soil health (see Section 3.3, Vegetation, for a discussion of rangeland improvement programs). In addition, grazing disturbance could result in a shift in biological soil crust community composition toward species that are more resistant to grazing (Concostrina-Zubiri et al. 2014).

### **Vegetation and Forest Management**

Desired future conditions for vegetation and forest management emphasize establishment, restoration, and maintenance of sustainable and healthy ecosystems. Restoration activities to move vegetation toward desired conditions would, in theory, support long-term protection of soils from erosion and restoration of natural soil structure, function, and productivity. However, very few studies looking at the long- and short-term effects of vegetation management on soil resources have been completed. Vegetation and forest management activities that cause ground disturbance or remove or change vegetation structure could cause short-term impacts on soil resources, leading to a temporary increase in the soil erosion potential, compaction, or changes to soil structure. For example, invasive or noxious plant treatment and prescribed burns would limit proliferation of treated vegetation. A short-term decrease in vegetation cover could temporarily destabilize soils and increase potential erodibility of soils. If heavy equipment is required for treatments (for example, tractors for reseeding), this equipment may further disrupt ground cover and compact or disturb soil surfaces.

While these short-term impacts could last up to 5 years, soils are predicted to stabilize as desired vegetation structure is established and natural soil protection (such as vegetation debris built up along soil surfaces) accumulates. As new vegetation becomes established in the long term, soils would be expected to stabilize and provide for the establishment of native vegetation. Impacts on vulnerable soils would likely be amplified depending on the nature of vegetation management activities. For example, some biotic soil organisms are vulnerable to herbicide application (Von Reis 2015) and very vulnerable to any ground disturbance (Belnap et al. 2007); some soil biota also may be damaged by fire (Johansen 2003).

Wildland fires cause complex impacts on soil resources that involve nutrient cycling dynamics, changes to water infiltration and runoff, and erosion susceptibility (Moody and Martin 2009; Moody et al. 2008; Martin

and Moody 2001). Fire impacts vary depending on site-specific conditions, including vegetation fire condition class, vegetation community adaptations to fire, burn severity, and pre-burn soil conditions. Loss of vegetation cover and structure from high-severity burns dramatically decreases soil cover, exposing soils to wind and water erosion, destabilizing soils, and increasing mass wasting susceptibility. Fires may also cause changes to soil chemistry and structure, which impact soil productivity and hydrologic function, including development of temporary hydrophobicity and impeded infiltration (Woods et al. 2007).

Fire prescriptions, fuels management, and fire suppression can minimize or mitigate some of these soil resource impacts from high-intensity fires (by reducing the potential for severe fires); however, they may cause some short-term impacts on soils, such as soil compaction or displacement from surface-disturbing fire suppression tactics or fuel treatments and altered soil chemistry from chemical retardants.

The potential impacts on soil resources from various management activities proposed under the alternatives would vary depending on the nature and magnitude of ground disturbance and/or restorative action proposed, the acreage of planned activities, the proximity to [vulnerable](#) resources, and the existence of legacy impacts from previous land uses. In general, activities and the associated impacts that would occur similarly across the alternatives are described and analyzed in *Impacts Common to All Alternatives*. However, as presented in **Chapter 2**, some differences in potential surface-disturbing activities would occur between the alternatives (based on acreage), which would result in varying levels of potential impacts on soil resources. For the purposes of comparison of impacts on soil resources between the alternatives, acreage is used as a proxy for the estimate of potential soil impacts. The subsections below summarize the relative impacts of foreseeable management actions for each project alternative in relation to soil resources.

### **Alternative A**

Alternative A, the existing management option, focuses on continuing existing land management practices and acreages for ROWs; grazing; recreation and OHV use; special designation areas; and forestry, fire, and vegetation management, as guided by existing management plans and guidance. Alternative A [may require operators to submit soil health and restoration plans prior to conducting surface-disturbing activities in areas of fragile or sensitive soils such as saline soils, highly erosive soils, and late successional biological soils](#). Under Alternative A, the BLM [may allow surface disturbance in fragile or sensitive soil areas as long as impacts would be mitigated and procedures would be applied to protect soils from accelerated or unnatural erosion](#). Current management under the GSENM RMP requires soil stabilization and surface water runoff minimization measures for slopes greater than 10 percent during and following project activities. Under the KEPA RMP, these same measures are required for slopes greater than 15 percent. Surface-disturbing activities would be prohibited on slopes greater than 30 percent with some exceptions considered. Effects [of on biological soil crusts would be considered before any surface disturbing activity](#).

However, current management plans do not necessarily require actions for maintaining vulnerable soils and biological soil crusts or for restoring areas with soil degradation. They also do not address legacy conditions. Areas with vulnerable soils or degraded areas would continue to be at risk for erosion from authorized activities, resource uses, and natural disturbance(s). Additionally, existing management measures in place do not necessarily meet current standards; they may not take into consideration current technology and mapping, and they may not utilize current science for BMPs to address soil erosion and soil resources.

The *Impacts Common to All Alternatives* section describes impacts of ground-disturbing activities associated with management actions on vulnerable soils, biological soils crusts, and soil health and function. These impacts have the potential to occur under Alternative A on lands that are open to ROW authorizations, OHV use, recreation, and livestock grazing. Below is an overview of the acreages that would be impacted by Alternative A and the activities that could result in impacts on soils.

Under Alternative A, the BLM would continue to manage approximately 630,400 acres as open to ROW authorizations (**Figure 2-43, Appendix A**). Impacts on soils from ROW activities, as described under *Impacts Common to All Alternatives*, would continue in these areas. Under current management plans, the BLM would continue to manage 881,300 acres as ROW exclusion areas (defined as no development activity allowed). Soil erosion and disturbance would continue to be reduced in these areas, thus maintaining soil health and function more effectively than in areas open to ROW authorizations.

Under Alternative A, OHV use would continue to be limited to designated routes on approximately 1,864,000 acres, while 1,500 acres would continue to be closed to OHV use, and 100 acres would be designated as OHV open (**Figure 2-32 in Appendix A**). Soil erosion and disturbance as a direct result of authorized recreational uses would be limited in these areas.

The BLM would continue managing 1,865,600 acres under recreation designations (SRMAs and ERMAs). Developed recreation that includes infrastructure, such as roads, parking areas, and facilities, results in ground disturbance during construction and visitor use, which could increase soil disturbance. Direct impacts from recreation activities would limit soil disturbance to those areas authorized for specific recreational impacts. The various acreages are not likely relevant to soil resources as long as changes in surface disturbance do not occur; however; see **Section 3.17, Recreation**, for further information on the magnitude of impacts associated with these management decisions that are not necessarily captured under a strict acreage analysis.

Restrictions on surface-disturbing activities to protect GSENM objects on lands with wilderness characteristics while emphasizing multiple uses, would indirectly protect soil resources in these areas from surface-disturbing activities and would prevent a decline in soil health and productivity. Management of areas with wilderness characteristics could include ROW exclusions and restrictions on travel, energy development, and other surface-disturbing activities if these uses were determined to be incompatible with protection of GSENM objects. Additionally, considering adjacent lands to identify new qualifying areas for lands with wilderness characteristics could reduce effects on soil resources in other areas in the future.

Under Alternative A, the BLM would manage 1,500 acres as ACECs or RNAs, which would result in restrictions on surface-disturbing activities from OHV use and ROW authorizations.

Under Alternative A, the BLM would continue to manage 2,117,300 acres as available for livestock grazing in the livestock planning area including portions of Glen Canyon, and 1,817,800 acres in the decision area. Impacts on soils from livestock grazing, as described under *Impacts Common to All Alternatives*, would be expected to continue in areas open to livestock grazing.

Under Alternative A, soils with high degradability susceptibility, high bare soil cover, low litter cover, or with biological soil crust occurrence (see **Section 3.2, Soil Resources, Affected Environment** and **Figures 3-5, 3-9, 3-10 in Appendix A** and **Figure 18 in Appendix B**) would be at an increased risk of losing soil function and health as a result of ground-disturbing activities.

### **Alternative B**

Management of soil resources under Alternative B would be more protective than under Alternative A. While Alternative A seeks to maintain and enhance soil stability, a primary objective of Alternative B is to protect and restore soil health, productivity, stability, and infiltration to prevent erosion from disturbance and to provide optimal plant growth and site potential. This alternative would also avoid soil-disturbing actions on vulnerable soils, biological soil crusts, and areas of soil vulnerability (for example, erosion, mass movement, and potential loss of function), and in areas determined as having low restoration potential **except for purposes of land health restoration or if the action would not cause sustained degradation of soil resources**. If soil-disturbing discretionary actions were to be allowed in areas containing vulnerable soils, a soil health and restoration plan would be developed and approved **which would provide mitigation to avoid, minimize, and/or compensate for adverse effects on soil resources**. This would provide more protection from surface-disturbing activities on fragile soils than Alternative A. Surface-disturbing activities would be avoided on slopes greater than 30 percent with some exceptions considered for scientific and research purposes.

This alternative would promote soil health through the use of active management. **Future travel management planning** designating routes as open, limited, or closed) would **consider and best allocate** opportunities for motorized and mechanized travel **to avoid, protect, and minimize impacts** in areas of highly erodible soils. **While unauthorized OHV use may occur on GSENM it has not been identified as a concern**. Additionally, this alternative would require measures to stabilize soils and minimize surface water runoff for actions on slopes greater than 10 percent and avoid soil-disturbing, discretionary actions on slopes greater than 30 percent **(this would be common to all alternatives)**. These measures would contribute to minimizing the susceptibility of soils to wind and water erosion, and the loss of soil function associated with land management activities. Alternative B would also require a complete land health assessment **for nine priority watersheds** and, if needed, causal factor determinations within departed watersheds within 2 years of signing the ROD. **Appropriate actions to help fulfill land health standards would need to be taken within 5 years of signing the ROD under Alternative B**.

The *Impacts Common to All Alternatives* section above describes the impacts of ground-disturbing activities associated with management actions on vulnerable soils, biological soils crusts, and soil health and function. These impacts would apply to soils that would be disturbed under Alternative B. Any activity that results in increased erosion or topsoil disturbance, including ROW authorizations, OHV use, recreation, and livestock grazing, could impair soil health and function, and reduce biological soil crust cover across the planning area. Below is an overview of the acreages that would be impacted by Alternative B and would result in impacts on soils.

Under Alternative B, the BLM would manage **945,700** acres as ROW exclusion areas, compared with 881,300 acres under Alternative A. The BLM would manage 72,000 acres of lands with wilderness characteristics to protect those characteristics, while Alternative A would manage for discretionary **action** but not actively protect lands with wilderness characteristics. Alternative B **same as C, and E** proposes the highest area managed as ACECs/RNAs, with **56,300** acres, compared with **1,500** acres under Alternative A.

Under Alternative B, the BLM would manage **2,042,100** acres as available and **215,100** acres as unavailable for livestock grazing **in the planning area**. Comparatively, Alternative A would allow **2,117,300** acres for livestock grazing, and **139,900** acres would be unavailable for livestock grazing **in the planning area**. **In the**



decision area 1,742,600 acres would be available for livestock grazing under Alternative B, compared to 1,817,800 acres in the decision area under Alternative A. Reducing the areas available for livestock grazing would reduce the extent and intensity of effects on vulnerable soils and biological soil crusts. As discussed in the *Trends* section above, much of the planning area currently exhibits degraded soil health, and livestock grazing can contribute to soil health declines. Reducing the areas that are available for livestock grazing under Alternative B would be expected to provide improvements in soil health parameters, including reduction in areas of bare soil, higher litter cover, and increased biological soil crust cover, particularly in vulnerable soil areas that are made unavailable for livestock grazing. Allotments that have not been available since before GSENM was established, and which are therefore in a largely natural or recovered state (e.g., reestablishment of biological soil crusts, lack of soil disturbance), would be protected from possible future disturbance and degradations that would occur if grazing were introduced.

Due to the larger acreage of ROW exclusion, the protection for lands with wilderness characteristics, ACEC management, and land unavailable for livestock grazing under Alternative B than under Alternative A, more soil resources would be protected from surface-disturbing activities, as described under *Impacts Common to All Alternatives*.

### **Alternative C**

In general, management of soil resources under Alternative C would be more protective than under Alternative A. The primary difference with Alternative C's management is that more protective measures would be implemented within the outback and primitive areas. Within the outback and primitive areas, Alternative C would promote soil health primarily through the use of passive management rather than active management. This alternative would also avoid soil-disturbing actions on vulnerable soils, biological soil crusts, and areas of soil vulnerability (for example, erosion, mass movement, and potential loss of function), and in areas determined as having low restoration potential except for purposes of land health restoration or if the action would not cause sustained degradation of soil resources in the Front Country and Passage Areas. These activities would be prohibited in the Outback and Primitive Areas, but exceptions could be made for land health restoration or where the action would not cause sustained degradation of soil resources. If soil-disturbing discretionary actions were to be allowed in areas containing vulnerable soils, a soil health and restoration plan would be developed and approved which would provide mitigation to avoid, minimize, and/or compensate for adverse effects on soil resources. This would allow for more protection of fragile soil resource than Alternative A, especially in the Outback and Primitive Zones. All actions on slopes greater than 10 percent would require soil stabilization and surface water minimization measures and surface-disturbing activities would be avoided on slopes greater than 30 percent with some exceptions considered for scientific and research purposes.

Passive management reduces the short-term direct impacts on soils by limiting direct disturbance caused by implementing management actions within a given area. However, passive management could also result in slow or nonrecovery in many areas, which would negatively impact overall soil health (see discussion of passive management in **Section 3.5.2**, Alternative D). Slow recovery of vegetative cover or changes in the types of vegetative cover (such as increased noxious weeds) could damage soil health by increasing soil exposure, thus exacerbating the potential for soil erosion and degradation. Alternative C would also require a complete land health assessment for nine priority watersheds and, if needed, causal factor determinations within departed watersheds within 2 years of signing the ROD. Appropriate actions to help fulfill land health standards would need to be taken within 5 years of signing the ROD under Alternative C.

The *Impacts Common to All Alternatives* section describes impacts of ground-disturbing activities associated with management actions on vulnerable soils, biological soil crusts, and soil health and function. These impacts would apply to soils that would be disturbed under Alternative C. Any activity that results in increased erosion or topsoil disturbance could impair soil health and function and reduce biological soil crust cover across the planning area. Below is an overview of the acreages that would be impacted by specific management actions under Alternative C; these could result in impacts on soils.

Alternative C would allow an intermediate option with 10,900 acres available for ROW applications, compared with 630,400 acres under Alternative A. Alternative C proposes to protect 240,600 acres of lands with wilderness characteristics, while Alternative A would manage for discretionary actions but not actively protect lands with wilderness characteristics. Alternative C proposes the highest area managed as ACECs/RNAs, with 56,300 acres (the same as Alternatives B and E), compared with 1,500 acres under Alternative A.

Under Alternative C, the BLM would manage livestock grazing allocations the same as under Alternative B, with 2,042,100 acres as available and 215,100 acres as unavailable for livestock grazing in the planning area. Comparatively, Alternative A would allow for 2,117,300 acres for livestock grazing, and 139,900 acres would be unavailable for livestock grazing in the planning area. In the decision area 1,742,600 acres would be available for livestock grazing under Alternative C, compared to 1,817,800 acres in the decision area under Alternative A. Impacts from grazing on soils within GSENM would be the same as under Alternative B and reduced from Alternative A.

Due to the larger acreage of ROW exclusion, the protection for lands with wilderness characteristics, ACEC management, and land unavailable for livestock grazing under Alternative C than under Alternative A, more soil resources would be protected from surface-disturbing activities.

#### **Alternative D**

Alternative D would be more protective of soil resources than all other alternatives because it would emphasize the protection, maintenance, enhancement, and/or restoration of soil health, productivity, and stability. A primary objective of Alternative D as it relates to soil resources is to protect, maintain, enhance, and/or restore soil health, productivity, stability, and infiltration to prevent erosion from disturbance and to provide for optimal plant growth and site potential. For example, this alternative would prohibit soil-disturbing, discretionary actions on slopes greater than 30 percent, except for scientific and research purposes. All actions on slopes greater than 10 percent would require soil stabilization and surface water minimization measures. This alternative would also avoid soil-disturbing actions on vulnerable soils, biological soil crusts, and areas of soil vulnerability (for example, erosion, mass movement, and potential loss of function), and in areas determined as having low restoration potential except for purposes of land health restoration or if the action would not cause sustained degradation of soil resources. If soil-disturbing discretionary actions were to be allowed in areas containing vulnerable soils, a soil health and restoration plan would be developed and approved which would provide mitigation to avoid, minimize, and/or compensate for adverse effects on soil resources. This would provide more protection to fragile soils than Alternative A.

Areas of biological soil crusts would be maintained, improved, and restored; this is similar to the objective outlined under Alternative A. Alternative D would promote soil health primarily through the use of passive management. Passive management reduces the short-term direct impacts on soils by limiting direct

disturbance caused by implementing management actions within a given area, but could also result in slow or nonrecovery in many areas, which would negatively impact overall soil health (see discussion of passive management under Alternative C, above). [Alternative D would also require a complete land health assessment for the entirety of GSENM and, if needed, causal factor determinations within departed watersheds within ten years of signing the ROD.](#)

Additionally, for routes designated for public use, future travel management planning (that is, designating routes as open, limited, or closed) would eliminate motorized and mechanized travel in areas of highly erodible soils. Alternative D would also require a complete land health assessment and, if needed, causal factor determinations across GSENM within 10 years of signing the ROD.

The *Impacts Common to All Alternatives* section describes impacts of ground-disturbing activities associated with management actions on vulnerable soils, biological soil crusts, and soil health and function. These impacts would apply to soils that would be disturbed under Alternative D. Any activity that results in increased erosion or topsoil disturbance could impair soil health and function and reduce biological soil crust cover across the planning area. Below is an overview of the acreages that would be impacted by Alternative D; these could result in impacts on soils.

Alternative D is the more restrictive option for acreage open for ROW usage (2,300 acres) compared with Alternative A, which would manage [630,400 acres](#) open for ROW usage. Of the four alternatives, under Alternative D the BLM would manage the largest area for the protection of wilderness characteristics (559,600 acres), whereas Alternative A would not identify management actions specific for the protection of wilderness characteristics. Under Alternative D, the BLM would manage [1,500 acres](#) as ACECs/RNAs, which would result in [exclusions](#) on surface-disturbing activities from OHV use and ROW authorizations; this is the same acreage as under Alternative A. [Travel would only take place in designated routes.](#)

Alternative D would be the most restrictive for livestock grazing with [918,300 acres available](#) and [1,338,900 acres unavailable](#) to grazing in the planning area. [In the decision area, 686,300 acres would be available and 1,179,300 acres would be unavailable for grazing under Alternative D.](#) Comparatively, Alternative A would allow [2,117,300 acres](#) for livestock grazing, and [139,900 acres](#) would be unavailable for livestock grazing in the planning area. [In the decisions area, 1,817,800 would be available for grazing under Alternative A, and 47,800 acres would unavailable for grazing.](#) Reducing areas available for livestock grazing would reduce the extent and intensity of effects on vulnerable soils and biological soil crusts, and would be expected to provide improvements in soil health parameters, particularly in vulnerable soil areas that are made unavailable for livestock grazing.

Due to the larger acreage of ROW exclusion, the protection for lands with wilderness characteristics, and land unavailable for livestock grazing under Alternative D than under Alternative A, more soil resources would be protected from surface-disturbing activities.

### **Alternative E**

[In general, management of soil resources under Alternative E would be more protective than under Alternative A. The primary difference is that, similar to Alternative C, more protective measures would be implemented within the outback and primitive areas . Within the outback and primitive areas, Alternative E would promote soil health primarily through the use of passive management rather than](#)

active management. Additionally, soil-disturbing actions on vulnerable soils, biological soil crusts, and other areas of soil vulnerability (for example, erosion, mass movement, and the potential loss of function) and in areas determined as having low restoration potential would be prohibited within the outback and primitive areas. These activities would be avoided on fragile soils in Front Country and Passage Areas. If surface-disturbing discretionary actions were allowed on biological soil crusts and areas of soil vulnerability, a soil health and restoration strategy including restoration and/or protective measures would be developed and approved. This would provide more protection to fragile soils than Alternative A. All actions on slopes greater than 10 percent would require soil stabilization and surface water minimization measures. Surface-disturbing activities would be avoided on slopes greater than 30 percent with some exceptions considered for scientific and research purposes.

Passive management reduces the short-term direct impacts on soils by limiting direct disturbance caused by implementing management actions within a given area. However, passive management could also result in slow recovery or nonrecovery in areas, which would negatively impact overall soil health (see the discussion of passive management in **Section 3.5.2**, Alternative D). Slow recovery of vegetative cover or changes in the types of vegetative cover (such as increased noxious weeds) could damage soil health by increasing soil exposure, thus exacerbating the potential for soil erosion and degradation. Alternative E would also require a complete land health assessment for nine priority watersheds and, if needed, causal factor determinations within departed watersheds within 5 years of signing the ROD. Appropriate actions to help fulfill land health standards would need to be taken within 10 years of signing the ROD under Alternative E.

The *Impacts Common to All Alternatives* section describes impacts of ground-disturbing activities associated with management actions on vulnerable soils, biological soils crusts, and soil health and function. These impacts would apply in some circumstances to soils that would be disturbed under Alternative E. Any activity that results in increased erosion or topsoil disturbance could impair soil health and function and reduce biological soil crust cover across the planning area. Below is an overview of the acreages that would be impacted by specific management actions under Alternative E; these could result in impacts on soils.

Alternative E would allow 10,900 acres available for ROW applications, compared with 630,400 acres under Alternative A. Alternative E (similar to Alternative C) proposes to protect 329,400 acres of lands with wilderness characteristics, while Alternative A would manage for discretionary actions but not actively protect lands with wilderness characteristics. Alternative E proposes 56,300 acres managed as ACECs/RNAs (the same as Alternatives B and C), compared with 1,500 acres under Alternative A.

Under Alternative E, the BLM would manage 1,737,300 acres as available and 128,300 acres as unavailable for livestock grazing. Comparatively, Alternative A would allow for 1,817,800 acres available for livestock grazing, and 47,800 acres would be unavailable for livestock grazing. Reducing areas available for livestock grazing would reduce the extent and intensity of effects on vulnerable soils and biological soil crusts. It would be expected to provide comparative benefit in soil health parameters, particularly in vulnerable soil areas that are made unavailable for livestock grazing.

Due to the larger acreage of ROW exclusion compared with Alternative A, the protection for lands with wilderness characteristics, ACEC management, and the greater unavailability of land for livestock grazing under Alternative E than under Alternative A, more soil resources would be protected from surface-disturbing activities.

### **Cumulative Impacts**

The cumulative impacts analysis for soil resources is restricted to the decision area and considers historical events and activities, ongoing trends, and reasonably foreseeable future actions. The analysis considers the combination of human activities, natural events, and exacerbating effects associated with climate change.

ROW leases associated with infrastructure development projects are expected to increase in the future. These would include projects such as utility lines, access roads, and waterlines. Specific projects include the Skutumpah road paving, the Garkane Transmission ROW (Buckskin to Fredonia Powerline), the Lake Powell Pipeline ROW, the McCullough Powerline ROW, Garkane Buckskin to Page ROW, and at least two Title 23 material site ROWs. Any ongoing or proposed ROW development projects would increase the total footprint of disturbed soils within the decision area, which would have an additive effect from any vegetation removal and manipulation, grading, excavation, and soil displacement. Effects would include the temporary loss of soils through erosion and decreased soil productivity.

Recreation and visitor use are expected to increase in the future. The activities identified as having growth potential include hiking, backpacking, mountain biking, OHV use, and applications for SRPs and recreational use permits. Impacts from all these activities would primarily be localized to existing and established trails and routes; therefore, losses to soil resources would be limited to those areas. However, travel outside designated or existing routes and creation of social trails have occurred and will likely occur within the decision area; these would expand the footprint of soil disturbance and the potential for soil erosional losses. While projects such as the East Zion Initiative and the Calf Creek Recreation Area Site may expand the footprint of soil disturbance, they would also disperse visitors out of GSENM, thus reducing potential soil disturbance within GSENM.

Cumulative impacts to soils from trends in livestock grazing would depend on a number of environmental factors; however, the BLM would continue to evaluate rangeland health to ensure no substantial loss of soil productivity occurs in response to changes in grazing management.

Vegetation management projects aimed at reducing hazardous fuels and undesirable vegetation, would be aimed at creating more resilient landscapes with more stable soil surfaces that are less prone to erosional losses and mass wasting. While these vegetation management projects would result in short-term adverse impacts on soils, they will potentially have a net long-term benefit to soils.

## **3.3 VEGETATION, INCLUDING SPECIAL STATUS PLANTS**

### **3.3.1 Affected Environment**

#### **Current Conditions**

This section summarizes the current conditions, trends, and forecasts of terrestrial vegetation in GSENM. Appendix I.3 also provides additional context. Additional vegetation conditions can be found throughout Appendix B. AIM data was also used in crafting the action Alternatives for this Final EIS. Terrestrial vegetation includes plant species not associated with rivers, creeks, lakes, springs, wetlands, or other surface or shallow subsurface water. Most decision area vegetation is terrestrial. For analysis on riparian areas, see Section 3.4, Water Resources. Due to past and ongoing climate-related factors (see Section 3.1.2, Climate Change (Including Greenhouse Gases), fire suppression, and livestock grazing, there are areas of elevated fuel loads across terrestrial vegetation in GSENM.

*Existing Vegetation Type*

Acres of the 12 dominant LANDFIRE existing vegetation types in the decision area are summarized in **Table 3-8**. Additionally, **Figure 3-13, Appendix A** displays the 12 dominant vegetation types found in the decision area. Detailed descriptions of the ecological systems are available in NatureServe's International Ecological Classification Standard (NatureServe 2009).

**Table 3-8. LANDFIRE Existing Vegetation Types in the Decision Area**

| Ecological Systems Code | Existing Vegetation Type                            | Extent (Acres) <sup>1</sup> |
|-------------------------|---|-----------------------------|
| 7016                    | Colorado Plateau Pinyon-Juniper Woodland            | 506,400                     |
| 7102                    | Colorado Plateau Pinyon-Juniper Shrubland           | 347,600                     |
| 9001                    | Colorado Plateau Mixed Bedrock Canyon and Tableland | 314,800                     |
| 7078                    | Colorado Plateau Blackbrush-Mormon-tea Shrubland    | 306,500                     |
| 7080                    | Intermountain Basins Big Sagebrush Shrubland        | 130,400                     |
| 7127                    | Intermountain Basins Semi-Desert Shrub-Steppe       | 55,100                      |
| 7081                    | Intermountain Basins Mixed Salt Desert Scrub        | 41,000                      |
| 9009                    | Intermountain Basins Shale Badland                  | 31,400                      |
| 7093                    | Southern Colorado Plateau Sand Shrubland            | 30,200                      |
| 7066                    | Intermountain Basins Mat Saltbush Shrubland         | 17,400                      |
| 7086                    | Rocky Mountain Lower Montane-Foothill Shrubland     | 14,100                      |
| 9336                    | Great Basin and Intermountain Ruderal Shrubland     | 13,800                      |
| N/A                     | Other <sup>2</sup>                                  | 56,800                      |
| -                       | <b>Total</b>  | <b>1,865,600</b>            |

Source: BLM GIS 2022

<sup>1</sup> Rounded to the nearest 100 acres

<sup>2</sup> There are 52 additional LANDFIRE existing vegetation types totaling approximately 56,800 acres throughout GSENM. These are not shown in the table.

*Ecological Site Groups*

Ecological site groups are generalized groupings of U.S. Department of Agriculture, NRCS ecological sites. Ecological site groups incorporate additional context and information about how landscapes may respond to management. The ecological site groups and their extent in the decision area are summarized in **Table 3-9** and shown in **Figure 3-14, Appendix A**.

**Table 3-9. Ecological Site Groups in the Decision Area**

| Ecological Site Group <sup>1</sup>    | Extent (Acres) <sup>2</sup> |
|---------------------------------------|-----------------------------|
| Arid Warm Sandy and Loamy Uplands     | 377,700                     |
| Arid Warm Shallow                     | 305,500                     |
| Arid Warm Very Shallow                | 289,100                     |
| Semiarid Warm Shallow and Deep Rocky  | 252,100                     |
| Semiarid Warm Sandy and Loamy Uplands | 187,900                     |
| Semiarid Warm Very Shallow            | 78,100                      |
| Arid Warm Breaks                      | 70,100                      |
| Outcrops                              | 62,900                      |
| Semiarid Warm Finer Uplands           | 53,500                      |
| Arid Warm Deep Rocky                  | 47,100                      |
| Semiarid Warm Breaks                  | 31,000                      |
| Arid Warm Finer and Clay Uplands      | 26,100                      |

| <b>Ecological Site Group<sup>1</sup></b>           | <b>Extent (Acres)<sup>2</sup></b> |
|--|-----------------------------------|
| Arid Warm Saline Uplands                           | 21,800                            |
| Arid Warm Sandy Bottoms                            | 18,100                            |
| Arid Warm Saline Hills                             | 11,300                            |
| Arid Warm Saline Bottoms and Bottoms               | 6,000                             |
| Semiarid Warm Sandy Bottoms and Bottoms            | 5,500                             |
| Arid Warm Gypsum                                   | 4,600                             |
| Riparian   | 3,400                             |
| Semiarid Cool Shallow                              | 3,000                             |
| Semiarid Warm Saline Hills                         | 2,400                             |
| Semiarid Cool Deep Rocky                           | 2,000                             |
| Semiarid Warm Saline Uplands                       | 1,700                             |
| Semiarid Warm Saline Bottoms                       | 1,600                             |
| Semiarid Cool Very Shallow                         | 700                               |
| Semiarid Cool Breaks                               | 600                               |
| Semiarid Cool Saline Sandy Loamy and Finer Uplands | 500                               |
| Semiarid Warm Clay Uplands                         | 300                               |
| Semiarid Warm Gypsum                               | 200                               |
| Semiarid Cool Clay Uplands                         | <100                              |
| Semiarid Cool Bottoms                              | <100                              |
| Semiarid Cool Sandy Bottoms                        | <100                              |

Source: Nauman et al. 2022; BLM GIS 2022

<sup>1</sup> For a crosswalk of ecological sites to ecological site groups, see the supplementary materials in Nauman et al. 2022.

<sup>2</sup> Rounded to the nearest 100 acres

### *Special Status Species*

Fifty percent of the rare flora in Utah are found within the GSENM landscape. The area also supports 125 species of plants that occur only in Utah or on the Colorado Plateau (Belnap 1997).

**Table I-11 in Appendix I.3** lists the plants that are federally listed under the ESA of 1973 (16 USC §1531 et seq.) and BLM sensitive plant species managed under BLM Manual 6840, Special Status Species, that have been documented, or that have the potential to occur in GSENM. In summary, there are six plants listed under the ESA and 18 BLM sensitive plants (including the federally listed plants) that have been documented in or that have the potential to occur in GSENM.

### **Trends**

The main drivers that historically affected vegetation in the region, as well as in the planning area, are livestock grazing and changes in fire regimes and climate resulting in vegetation community conversion. This has primarily occurred as pinyon-juniper woodland expansion into sagebrush and other shrub-dominated communities. Community conversion has also occurred because of invasive plant spread, including the invasive annual cheatgrass. Planning area vegetation has also been affected by wildfire, as well as mechanical treatments to improve rangeland conditions. Pinyon-juniper woodlands have expanded over the last century into grassland and shrubland ecosystems throughout the western United States.

### *Special Status Species*

Little information is available documenting the current trends, habitat conditions, and population size of most special status plant populations throughout Utah, including BLM sensitive plants (BLM 2018).

However, the threat of climate change and its associated drought, wildfire, and herbivory effects may be the most significant threat faced by special status plant species in the planning area.

### **Forecasts**

Warming temperatures, drought, fire, and other extreme weather effects are expected to increase in frequency and will likely contribute to impacts on terrestrial vegetation and special status plants as climate change continues.

Vegetation communities expected to have the greatest exposure (that is, a higher probability for change) to climate change are shrublands, especially big sagebrush (*Artemisia tridentata*) and blackbrush (*Coleogyne ramosissima*)-Mormon tea (*Ephedra viridis*) communities, and pinyon-juniper woodland (Bryce et al. 2012, p. 155). Insects and disease will play a collateral role with the effects of climate change in altering the dominance and distribution of various vegetation species (Bryce et al. 2012, p. 155); in turn, this will alter the distribution and availability of habitat for special status species.

### **3.3.2 Environmental Consequences**

Refer to **Section F.8**, Vegetation, in **Appendix F**, Analytical Framework, for descriptions of the indicators, analysis areas, and assumptions used for the following analysis.

#### **Issues**

- How would existing and proposed land use allocations and discretionary actions affect terrestrial vegetation, including special status plant species?
- How would vegetation management and restoration approaches affect landscape-scale ecological functioning, terrestrial vegetation, and special status plant species?

#### **Impacts Common to All Alternatives**

Livestock grazing and trampling can reduce terrestrial vegetation productivity by causing soil compaction or erosion and damaging native plants and tree seedlings (Jones et al. 2009; Guenther et al. 2004; Duniway et al. 2018). Grazing can also reduce ecological resilience by increasing the spread of invasive plants, altering fuels loads, and altering species composition (Bartos et al. 2001; Young 1989).

In some cases, the reduction in fine fuels caused by grazing could lower the fire hazard. However, this fine-fuel reduction can also reduce the number or acreage of low-severity surface fires that would have kept stand densities in check. Reduced surface fires can lead to increased tree densities, as has historically been the case with Utah juniper, in turn leading to hazardous fuels accumulations and the potential for uncharacteristically severe fire (Belksy and Blumenthal 1997; Fuhlendorf et al. 2008).

In other vegetation communities, such as in the aspen-conifer community, grazing can exacerbate effects from fire exclusion by increasing the opportunity for conifer encroachment and allowing aspen to succeed to conifers (Bartos et al. 2001).

Grazing, particularly overgrazing, can alter species composition in non-forested vegetation types by increasing the percentage of woody species (Young 1989) and creating disturbance pathways that increase the spread of invasive weeds, such as cheatgrass. Accelerated erosion associated with overgrazing can shift perennial forb and grasslands to less mesic ecotypes.



Livestock grazing has also been identified as a threat to some special status plant species in the planning area, like Kane breadroot. Livestock can trample plants, damaging or killing them.

However, all alternatives include management direction to mitigate the risks of these impacts and to emphasize sustainable, healthy rangelands with respect to grazing practices. The management direction would differ somewhat under each alternative, as would the specific areas made unavailable to livestock grazing (see **Section 3.16**, Livestock Grazing). Management direction under Alternatives B, C, **D**, and **E** would similarly ensure that grazing is managed to meet BLM standards for range land health, in a manner that is consistent with the protection of GSENM objects. Based on this direction, livestock grazing likely has a neutral effect on the potential to achieve terrestrial vegetation desired conditions at the broad scale; however, there is the potential for site-specific negative **impacts to occur**, especially on non-forested plant communities.

Under all alternatives, grazing permit lease holders may voluntarily relinquish their permits per the procedures in Proclamation 10286. **Forage shall not be reallocated for livestock grazing purposes unless the Secretary specifically finds that such reallocation will advance the purposes of Proclamation 10286 and Proclamation 6920.** In such areas, vegetation communities and rare plant habitats would no longer be subject to the effects from livestock grazing as described above.

Effects on vegetation may result from various forms of recreation use. Development of new trails and facilities, human ignition of unwanted fires, and cross-country OHV use (**both authorized and unauthorized**) could change terrestrial vegetation indicators. The effects of these activities are the loss or modification of vegetation, including at-risk plants; the spread of noxious or invasive weeds; and **destruction of top and sub-soil structure**. The level and intensity of change to vegetation depends on the scale of recreation. For example, human-caused ignitions could result in small acres being burned or over thousands of forested acres being lost from a high-severity fire, depending on current conditions. New development or expansion of trails, roads, campgrounds, or facilities would result in the permanent loss of vegetation types at the local level, but would likely not result in effects at the landscape-scale. All alternatives would be subject to these effects; however, adverse effects on vegetation would be most prominent in areas of higher recreation, such as in motorized and more easily accessible areas. Even where limited to designated routes, OHV and other forms of motorized recreation can affect adjacent vegetation communities and rare plant habitat. For example, this can occur by depositing fugitive dust on vegetation and, when severe enough, suppressing plant function and pollinator success, spreading noxious weeds or invasive nonnative plants into uninfested habitats, and increasing the potential for human-caused fires ignited on roadsides to burn into adjacent vegetation. **Vegetation can also be impacted when OHV users turn around, pull to the side of a route to park, or camp off adjacent to designated routes.**

Where recreation is managed using an SRMA or ERMA on BLM-managed lands, impacts from recreation could be concentrated in one area; however, this could prevent impacts from dispersed recreation elsewhere in the GSENM. Further, rules and guidelines in SRMAs and ERMAs would limit or control activities through specialized management tools, such as designated campsites, permits, area closures, and limitations on the number of users, duration of use, and types of events.

Areas identified as avoidance or exclusion for ROWs would reduce the risk of crushing or removing vegetation and the introduction and spread of noxious and invasive weeds and fugitive dust. ROW exclusion areas would offer greater protections for vegetation than avoidance areas because they would

completely prohibit surface-disturbing activities. Limiting vehicle use to designated routes would also reduce the amount of vegetation crushed or removed.

Across all alternatives, federally listed species will be protected according to the ESA, which would provide enhanced protection for these species and support their continued existence in GSENM. Additionally, managing habitat for BLM sensitive species per Manual 6840 would contribute to maintaining special status species habitat and populations, reducing the potential for listing under the ESA. Species occupying habitats that are often disturbed, such as roadsides, areas suitable for woodland product harvest, and high recreation use areas, would be vulnerable to removal of suitable habitat as well as direct removal of individuals. Various surface-disturbing activities, including vegetation management, OHV use, and ROW construction, can directly affect habitats for special status plant species. Recreational use, collection of plants, fire, as well as improper livestock grazing could remove or trample vegetation and disturb soil, resulting in adverse impacts on sensitive or at-risk plant species, like Kane breadroot.

Surface-disturbing activities also can indirectly affect special status species by contributing to soil erosion and transporting invasive species into these habitats. The spread of invasive species could adversely affect at-risk plants due to the limited occurrence size and distribution of these rare plants. Surface disturbance also can result in habitat fragmentation, which can isolate populations of special status plant species. Populations of special status plant species typically have a patchy distribution across the landscape; eliminating one or more populations can prevent gene flow among populations if residual populations are too far apart for sufficient cross-pollination. Habitat fragmentation would be a long-term impact on special status plant species. [Across all alternatives, utilizing management goals, objectives, and directions, and mitigating project impacts to minimize surface-disturbing and disruptive activities would decrease adverse impacts from surface disturbance. The management direction would differ somewhat under each alternative; however all alternatives include protections to limit impacts on special status species. Based on this direction, surface-disturbing activities and discretionary actions would likely have a neutral effect on the potential to achieve desired conditions for special status species at the broad scale.](#)

Manual treatments would selectively cut, clear, remove, or prune vegetation. Manual treatments would directly remove or modify target vegetation, in turn, changing vegetation structural and functional components by reducing percent cover of target species or changing species composition. Manual treatments would occur in areas where mechanical equipment use would be unlikely or unallowed, such as on steep slopes, near sensitive resources, or in [the primitive zone](#).

Manual treatments would have less potential to damage or kill nontarget vegetation than other methods, including mechanical treatments or prescribed fire. This is because workers could avoid nontarget vegetation and because the amount of surface disturbance associated with manual treatments is generally minor and localized. Nontarget vegetation may be damaged or killed by foot or vehicle traffic in the treatment locations, but this effect would be short term and localized.

Manually removing the shrub or pinyon-juniper canopy in treatment areas could release desired perennial grasses and other herbaceous species that are present in the shrub understory (Monsen et al. 2004). Indirectly, this would increase biodiversity by increasing percent cover of understory herbaceous species in the long term.

Manually removing the shrub or pinyon-juniper canopy could also release invasive annual grasses that are present in the understory (Davies et al. 2011b). This would also change vegetation structural and functional

components by increasing the percent cover of invasive annual grasses in both the treatment area, and potentially in the adjacent vegetation communities, for one to several seasons. Managing invasive, nonnative plants in accordance with local weed program monitoring protocol would reduce or prevent this impact.

Impacts on special status plant species from manual treatments would be similar to those described above for general vegetation. Because manual treatments allow for selective vegetation removal, impacts would generally be of low intensity with low vegetation and soil disturbance and would occur only within the direct footprint of the treatment. The likelihood for injury or mortality of undetected special status plant species would be virtually nonexistent on all categories of special status plants due to localized treatment, targeting of individual plants, and ability to control the level of disturbance.

Mechanical treatments would remove vegetation, prepare the seedbed, and sow in areas where manual treatments would be impractical. Similar to manual treatments, existing vegetation in the treatment area would be reduced and the soil surface disturbed during treatments. Removal would be done by use of vehicles with attached implements designed for vegetation management, such as agricultural mowers, masticators, disks and plows, chains and cables, rangeland drills, and harrows and imprinters. The intensity of these effects may be greater, because mechanical treatments would generally result in surface disturbance and vegetation removal over a larger area than manual treatments and the equipment would have direct contact with the soil. The ability to treat a larger area may mean that more vegetation could be moved toward desired conditions than manual treatments.

Similar to manual treatments, reduction of shrub or pinyon-juniper overstory using mechanical treatments could release desired perennial grasses and forbs in the understory (Monsen et al. 2004). Like manual treatments, mechanical treatments may also indirectly temporarily increase the percent cover of invasive annual grasses in the treatment area and potentially in adjacent vegetation communities (Davies et al. 2011b). Both effects may be greater when mechanical treatments are used, since mechanical treatments would generally affect larger contiguous areas. As described for manual treatments, managing invasive, nonnative plants in accordance with local weed program monitoring protocol would reduce temporary release of invasive annual grasses.

The effects from specific mechanical treatment types are described below. This suite of methods includes currently anticipated treatment types. However, other treatment types not yet identified or in common use would also be acceptable for implementation if they would result in similar or lesser effects on resources, such that the analysis in this EIS would be unaffected.

*Tilling and harrowing* would effectively remove vegetation in the short term by uprooting and burying it, creating an unvegetated area that would not carry fire. Tilling and harrowing also has the potential to create a seedbed suitable for desired species establishment. Relative to other mechanical methods, tilling and harrowing would result in the most disturbance to vegetation in the short term. This method is most suited for situations where complete vegetation removal is desired, and it is generally used in conjunction with other treatments, such as chemical treatments. For example, pre- and/or post-tilling and harrowing chemical treatments would reduce germination of, or treat, nonnative invasive plants or fire-prone vegetation that has germinated in the treatment area. Tilling and harrowing in areas where nonnative invasive plants are present, without follow-up chemical treatment, would increase the potential for long-term increases in nonnative invasive plant cover (Zouhar 2003) both in the treatment area and in adjacent vegetation. Conducting follow-up treatments would help to more quickly move vegetation toward desired

conditions in the long term by reducing the potential for increases in nonnative, invasive plant cover. While tilling and harrowing would remove the organic matter both below and above ground in the short term [and release carbon into the atmosphere](#), over the long term, organic matter stored in plants and soils within the decision area would likely increase compared with pre-treatment conditions, which can have implications for climate change through increased carbon sequestration and storage potential (see **Section 3.1.2, Climate Change (Including Greenhouse Gases)**).

*Chaining* would reduce shrub or pinyon-juniper cover, prepare the seedbed, and provide mulch over broadcast seed in the treatment area. Like tilling and harrowing, chaining would also disturb the soil. As described above, pre-treatment and/or follow-up chemical treatments would generally be used to reduce germination of, or treat, nonnative invasive plants or fire-prone vegetation. This would help to more quickly move vegetation in the treatment area toward desired conditions in the long term by reducing the potential for increases in nonnative, invasive plant cover. Chaining, similar to tilling and harrowing, would remove organic matter stored primarily in vegetation aboveground or previously damaged vegetation (that is, reduced carbon storage) [and release carbon into the atmosphere](#), but would likely improve long-term carbon storage potential relative to pre-treatment conditions.

*Imprinting and rangeland drill seeding* would reduce vegetation cover in the short term by increasing surface disturbance. Rangeland drill seeding would generally result in less impact intensity than imprinting, because imprinting crushes the vegetation, whereas drill seeding is typically used in areas that already lack vegetation (such as post-burn areas). Pre-treatment and/or follow-up chemical treatments would generally be used to reduce germination of, or treat, nonnative invasive plants or fire-prone vegetation and to prepare and sow the seedbed for desired species establishment. This would help to more quickly move vegetation toward desired conditions in the long term by reducing the potential for increases in nonnative, invasive plant cover. In these treatment methods, less disturbance to organic matter in soils [that would result in carbon loss](#) would occur compared with chaining, tilling, and harrowing.

*Mowing* would cut herbaceous and woody vegetation above the ground surface. It would reduce fuels loads in the short term, indirectly lowering flame length and reducing rates of fire spread when fire moved into the mowed area. Like other mechanical treatments, mowing could increase the potential for release of both desired perennial grasses and forbs (Monsen et al. 2004), and invasive annual grasses (Davies et al. 2011b), that are present in the shrub or pinyon-juniper understory. However, the amount of surface disturbance would be reduced compared to tilling, harrowing, or chaining, which may decrease the potential for invasive annual grass release or germination compared to other mechanical treatments. As described above, follow-up chemical treatments would generally be used to reduce germination of, or treat, nonnative invasive plants or fire-prone vegetation that has germinated. This would help to more quickly move vegetation toward desired conditions in the long term by reducing the potential for increases in nonnative, invasive plant cover. Mowing would primarily impact organic matter that is stored in vegetation above the surface and would result in less carbon loss from organic matter in soils compared with tilling, harrowing, and chaining.

*Mulching (mastication)* would remove woody vegetation from above the ground surface. This method uses a mechanical mulching tool attached to heavy equipment that shreds live trees from the top down and leaves a layer of mulch on the soil surface. The layer of mulch stabilizes soils, limits erosion, and prolongs moisture for seed germination. This method also reduces tree cover and fuel loads, especially where trees are too dense to hand thin. [Unlike, tilling, harrowing, and chaining, this method is very selective and results](#)

in less disturbance to non-target vegetation. The amount of surface disturbance from this method is limited to the tires/tracks from the heavy equipment, as the masticator does not make contact with the soil, which may decrease the potential for invasive annual grass release or germination compared with other mechanical treatments. As described above, follow-up chemical treatments would generally be used to reduce germination of, or treat, nonnative invasive plants or fire-prone vegetation that has germinated. This would help to more quickly move vegetation toward desired conditions in the long term by reducing the potential for increases in nonnative, invasive plant cover. Similar to mowing, mulching would primarily impact organic matter stored in vegetation above the surface, but would likely retain more carbon in soils than methods such as chaining, harrowing, and tilling.

Impacts from specific mechanical treatment methods, as described above for general vegetation, could occur on all undetected special status plant species; special status plants occurring in unique habitats would be avoided. Mechanical treatments that are non-selective and involve large equipment would potentially negatively impact undetected special status plant species due to the inability to be selective toward the target vegetation and the heavy machinery that is involved in implementing these treatments (Benton et al. 2016). Plant mortality and seed burial are likely to occur where there is deep soil surface disruption (such as from tilling and seeding/planting). Destruction of special status plant seed banks would be particularly harmful to species with seeds that remain viable in the soil for long periods of time before germinating. Conducting appropriately timed surveys within suitable or potential habitat would limit the chance of individuals and seed banks being undetected and occurring in a treatment area; however, due to the size and continuity of the treated area, surveys may not capture all individuals, particularly species that are not visible year-round or even every year.

Revegetation using seeds and seedlings would change the structural and functional components of vegetation in the long term. Revegetation would increase percent cover of desired species in the treatment area. Revegetation would also help to decrease potential invasive annual grass germination by providing competition in the form of desired perennial grasses and forbs and thus reducing available resources and growing space. This would help reduce ecosystem degradation in the long term from the annual grass invasion-wildfire cycle (D'Antonio and Vitousek 1992; Brooks et al. 2004).

To best meet project objectives, revegetation plant selection would be decided at the site level using guidance from BLM Handbook 1740-2. In accordance with the Handbook (BLM 2008, p. 87), the BLM would prioritize native plant material for revegetation unless the five listed exceptions can be met. Nonnative plants could be used when the natural biological diversity would not be diminished by nonnative species, when nonnative species could be confined to the treatment areas, when site inventory indicates a site would not support native species reestablishment, and/or when resource objectives could not be met with native species.

Per BLM Handbook 1740-2 (BLM 2008, p. 87), an additional condition of using nonnative plants is an unavailability of suitable native species. The BLM would follow the National Seed Strategy for Rehabilitation and Restoration (Plant Conservation Alliance 2015), which guides the development, availability, and use of seed needed for timely and effective restoration; however, it is possible that suitable native seed would be unavailable for revegetation. In addition to these considerations, nonnative plant species could be used under Alternative D, though their use would be restricted to phased restoration efforts or for emergency actions.

Various types of seeding treatments would be used in combination with mechanical and other treatments. Short-term effects on existing vegetation from seeding are localized, damaged or destroyed vegetation and surface disturbance from vehicles or machinery, as discussed for mechanical treatments. [Seeding treatments that utilize aircraft to disperse seed would negate these impacts.](#) In the long term, seeding treatments would increase the percent cover of desired vegetation, and help to more quickly move vegetation toward desired conditions.

In some cases, seeded species may spread into adjacent vegetation (McArthur et al. 1990; Gray and Muir 2013), altering the species composition of these areas. The potential for this impact and its intensity would depend on the seeding method proposed (such as drill seeding versus broadcast seeding), the species seeded, and existing vegetation conditions in adjacent areas.

Overall, revegetation would incrementally move plant community structure and function toward desired conditions by increasing community diversity and function, nutrient and hydrologic cycling, and plant vigor. This would promote maintenance of a more competitive plant community and reduce the threat of invasion by invasive plants. Over time, this would reduce available fuels during fire season, aid in restoring natural burn patterns and lengthening fire return intervals, and aid in increasing the resistance and resilience of treated areas.

Impacts on special status plant species from revegetation would be similar to those described for general vegetation above. Short-term impacts from the use of tools to implement revegetation are described under treatment-specific sections and would mainly apply to undetected special status species, seed banks, and pollinators. Movement toward desired vegetation states would increase biological and structural diversity. These changes would reduce threats to special status plant species (including those occurring in areas adjacent to treatment areas), such as potential loss of populations and habitat to wildfire and competition with invasive species, thereby aiding in recovery. They would also improve conditions for pollinators, thereby increasing pollination opportunities for special status plants.

Prescribed fire would be used under specific weather and wind conditions and appropriate ecological contexts and timing to remove plant biomass [or mimic natural disturbance regimes.](#)

When used in conjunction with other treatments, prescribed fire can help move vegetation toward desired conditions by improving seed bed conditions and facilitating desired vegetation establishment. For example, in areas with high invasive annual grass cover, prescribed fire would reduce the aboveground live plant and residual biomass cover and invasive annual grass seed bank in the short term, reducing competition for revegetation. Removing aboveground biomass can also release existing perennial grasses and forbs by freeing resources for growth (Monsen et al. 2004). In many types of vegetation in GSENM, prescribed fire is not an appropriate treatment until pre-fire mechanical fuels thinning is conducted. See **Section 3.13**, Fire and Fuels Management, for more information on prescribed fire and its effects on vegetation and fuels.

Known occurrences of special status plants would generally be avoided unless the species is fire adapted. Prescribed fires could kill undetected individuals or kill seeds in the upper soil layers. Many species of special status plants occur in unique soils or topography that are easy to identify and avoid. Prescribed fire during the active growth period would be most damaging to undetected special status plant species, but treatments would most likely occur when plants are dormant, thereby reducing potential for damage to live plants.

Chemical treatments can be used to remove target plants, or decrease target plant growth, seed production, and competitiveness, releasing native or desirable species from competitive pressure and aiding in their reestablishment where vegetation modification is desired. Potential impacts on nontarget vegetation include death, reduced productivity, and abnormal growth from unintended contact with chemicals via drift, runoff, wind transport, or accidental spills and direct spraying. The degree of impacts depends on the chemical used and its properties, such as persistence, the application rate, the treatment method, the physical site conditions, and the weather, such as wind or rain, during treatments (BLM 2007, p. 4-47, *Impacts Common to All Treatments*). These effects would generally be limited to the short term during and immediately following treatments, and following standard operating procedures (BLM 2007, Table 2-8) and mitigation measures (BLM 2016, Table 2-5) would prevent impacts or reduce impact intensity.

Chemical treatments would be unlikely to directly affect special status plants due to implementation of standard operating procedures (BLM 2007, Table 2-8) and mitigation measures (BLM 2016, Table 2-5). Potential impacts on undetected special status plants and seed banks would be the same as described above for general vegetation. They would depend on the active ingredient and application method.

Management direction for riparian and wetland vegetation differs slightly across alternatives, however surface disturbing activities that result in adverse impacts would generally be prohibited within 330 feet of riparian and wetland areas under all alternatives. Furthermore, under alternatives B, C, D, and E discretionary actions would also be prohibited within hanging gardens. This direction would offer additional protections to riparian and wetland vegetation and hanging gardens.

Additional BMPs as described in **Appendix C**, Best Management Practices, would also protect vegetation and special status species. These BMPs would be implemented on a project-by-project basis.

### **Alternative A**

Under Alternative A, current management of terrestrial vegetation would continue under the 2020 GSENM Approved RMP and the 2020 KEPA Approved RMP. The condition and trends for vegetation, as summarized in the affected environment (**Section 3.3**, *Vegetation, Affected Environment*), would be expected to continue along similar trajectories. These include reduced sagebrush community resistance and resilience from increases in invasive annual grasses and pinyon-juniper encroachment. Conversion to cheatgrass and other invasive annual grasses, which increase the presence of fine fuels and threaten sagebrush communities from fire, would likely continue at a similar rate. These changes in wildfire regime have caused degradation and loss of sagebrush habitats and have altered and simplified plant communities, leading to increased homogeneity of landscapes (Balch et al. 2013; West 2000). The increasing risk of uncharacteristic wildfire from woody fuel accumulation due to pinyon-juniper expansion and fire suppression, and the decline of sagebrush vegetation communities due to historical livestock overgrazing, increasing invasive annual grass cover, decreasing perennial grass cover, and poor canopy structure would continue and lead to further reduced ecological resilience, particularly in the face of climate change and increased drought. Vegetation management projects, where implemented, would help to move vegetation toward desired conditions and reduce these risks.

Individual woodland product removal and rangeland restoration projects would likely still occur under this alternative. Individual projects would generally reduce sagebrush community losses from wildfire and move vegetation communities toward desired conditions by improving plant community diversity, nutrient

and hydrologic cycling, and plant vigor. Vegetation restoration methods would be prohibited in relict plant communities and hanging gardens, unless needed for removal of noxious weed species. After surface disturbance, disturbed areas would generally be rested from livestock grazing for two growing seasons or until site objectives are met. Vegetation treatment monitoring data will be evaluated to determine when objectives for the seedings are met, and grazing can be resumed. This direction would help ensure that seeding efforts would be successful. Under Alternative A, nearly all allotments would be available for livestock grazing. In these areas, vegetation would continue to be impacted by grazing, as described in *Impacts Common to All Alternatives*. Funding from other agencies and/or organizations that provide money directly to livestock grazing permittees to complete habitat-improvement projects has been used to a minor extent to improve conditions on allotments within GSENM. These projects have been primarily focused on decadent brush removal to improve forage for grazing livestock. Because this funding is tied to allotment permittees, and Alternative A has the greatest number of allotments available for livestock grazing, there would be more available funding to mitigate grazing impacts under Alternative A. However, in the past, these types of projects occur infrequently, and these programs have not been often utilized; therefore, analysis of how these programs would impact vegetation across the range of alternatives is difficult to quantify. Additionally, other funding for vegetation projects would still occur through other organizations such as Utah’s Watershed Restoration Initiative.

The number of acres of ecological site groups that would be unavailable for livestock grazing under Alternative A is summarized in **Table 3-10**. Vegetation in these areas would be protected from the effects of grazing. The Arid Warm – Shallow (13,100 acres) and Arid Warm – Sandy Uplands, Loamy Uplands (19,600) ecological site groups contain the most acres that would be unavailable for livestock grazing. As described in **Appendix I, Table I-6**, these ecological site groups are susceptible to annual invasion and woody encroachment; therefore, making them unavailable to livestock grazing would help reduce these issues and would help move vegetation toward desired conditions and increase resiliency.

**Table 3-10. Ecological Site Groups Unavailable for Livestock Grazing under Alternative A**

| Ecological Site Groups                       | Acres Unavailable for<br>Livestock Grazing<br>(acres (%)) |
|--|---|
| Arid Warm - Sandy Uplands, Loamy Uplands     | 19,600 (5)  |
| Arid Warm - Shallow                          | 13,100 (4)  |
| Semiarid Warm - Sandy Uplands, Loamy Uplands | 6,600 (4)   |
| Semiarid Warm - Shallow, Deep Rocky          | 5,200 (2)   |
| Arid Warm - Very Shallow                     | 4,300 (1)   |
| Arid Warm - Breaks                           | 2,600 (4)   |
| Semiarid Warm - Very Shallow                 | 2,500 (3)   |
| Semiarid Warm - Finer Uplands                | 2,400 (4)   |
| Riparian                                     | 1,000 (29)  |
| Semiarid Warm - Breaks                       | 800 (3)   |
| Arid Warm - Deep Rocky                       | 700 (1)   |
| Outcrops                                     | 700 (1)   |
| Arid Warm - Sandy Bottoms                    | 700 (4)   |
| Semiarid Warm - Sandy Bottoms, Bottoms       | 500 (9)   |
| Arid Warm - Saline Uplands                   | 400 (2)   |
| Semiarid Warm - Saline Uplands               | 400 (24)  |
| Arid Warm - Finer Uplands, Clay Uplands      | 300 (1)   |
| Arid Warm - Saline Hills                     | 200 (2)   |
| Arid Warm - Saline Bottoms, Bottoms          | 200 (3)   |



| Ecological Site Groups         | Acres Unavailable for<br>Livestock Grazing<br>(acres (% <sup>1</sup> )) |
|--------------------------------|---|
| Arid Warm - Gypsum             | 100 (2)   |
| Semiarid Warm - Saline Hills   | 100 (4)   |
| Semiarid Warm - Saline Bottoms | 100 (6)   |
| <b>Total Acres</b>             | <b>62,500 (3)</b>   |

Source: BLM GIS 2022

<sup>1</sup>Percentage of total ecological site group acreage in GSENM.

The number of acres of ecological site groups that would be closed, limited to designated routes, and open to OHV travel is summarized in **Table 3-1 I**. The BLM would continue to manage OHV travel as limited to designated routes in 1,864,000 acres, or approximately 99 percent of GSENM, so most vegetation communities and special status plant habitats would be unlikely to be subject to the effects from cross-country OHV use as described in *Impacts Common to All Alternatives*. Small portions of four ecological site groups (primarily Semiarid Warm – Shallow, Deep Rocky, and also Semiarid Warm – Sandy Uplands, Loamy Uplands, Semiarid Warm – Breaks, and Semiarid Warm – Very Shallow) totaling approximately 1,500 acres or less than 1 percent of the decision area, would be closed to OHV travel.

**Table 3-1 I. Ecological Site Groups in Travel Management Areas under Alternative A**

| Ecological Site Group                           | Closed to<br>OHV Travel<br>(Acres (% <sup>1</sup> )) | OHV Travel Limited to<br>Designated Routes<br>(Acres (% <sup>1</sup> )) | Open to OHV<br>Travel<br>(Acres (% <sup>1</sup> )) |
|---|--|---|--|
| Arid Warm - Sandy Uplands,<br>Loamy Uplands     | 0 (0)  | 377,600 (100)   | 0 (0)  |
| Arid Warm - Shallow                             | 0 (0)  | 305,500 (100)   | 0 (0)  |
| Arid Warm - Very Shallow                        | 0 (0)  | 289,100 (100)   | 0 (0)  |
| Semiarid Warm - Shallow,<br>Deep Rocky          | 1,300 (1)  | 250,800 (99)  | 0 (0)  |
| Semiarid Warm - Sandy<br>Uplands, Loamy Uplands | 100 (0)  | 187,900 (100)   | 0 (0)  |
| Semiarid Warm - Very Shallow                    | 100 (0)  | 78,000 (100)  | 0 (0)  |
| Arid Warm - Breaks                              | 0 (0)  | 70,100 (100)  | 0 (0)  |
| Outcrops  | 0 (0)  | 62,900 (100)  | 0 (0)  |
| Semiarid Warm - Finer<br>Uplands                | 0 (0)  | 53,400 (100)  | 0 (0)  |
| Arid Warm - Deep Rocky                          | 0 (0)  | 47,100 (100)  | 0 (0)  |
| Semiarid Warm - Breaks                          | 0 (0)  | 31,000 (100)  | 0 (0)  |
| Arid Warm - Finer Uplands,<br>Clay Uplands      | 0 (0)  | 26,100 (100)  | 0 (0)  |
| Arid Warm - Saline Uplands                      | 0 (0)  | 21,800 (100)  | 0 (0)  |
| Arid Warm - Sandy Bottoms                       | 0 (0)  | 18,100 (100)  | 0 (0)  |
| Arid Warm - Saline Hills                        | 0 (0)  | 11,300 (100)  | 0 (0)  |
| Arid Warm - Saline Bottoms,<br>Bottoms          | 0 (0)  | 6,000 (100)   | 0 (0)  |
| Semiarid Warm - Sandy<br>Bottoms, Bottoms       | 0 (0)  | 5,500 (100)   | 0 (0)  |
| Arid Warm - Gypsum                              | 0 (0)  | 4,600 (100)   | 0 (0)  |
| Riparian  | 0 (0)  | 3,400 (100)   | 0 (0)  |
| Semiarid Cool - Shallow                         | 0 (0)  | 3,000 (100)   | 0 (0)  |
| Semiarid Warm - Saline Hills                    | 0 (0)  | 2,400 (100)   | 0 (0)  |
| Semiarid Cool - Deep Rocky                      | 0 (0)  | 2,000 (100)   | 0 (0)  |

| Ecological Site Group   | Closed to OHV Travel (Acres (% <sup>1</sup> )) | OHV Travel Limited to Designated Routes (Acres (% <sup>1</sup> )) | Open to OHV Travel (Acres (% <sup>1</sup> )) |
|---|--|---|--|
| Semiarid Warm - Saline Uplands  | 0 (0)  | 1,700 (100)   | 0 (0)  |
| Semiarid Warm - Saline Bottoms  | 0 (0)  | 1,600 (100)   | 0 (0)  |
| Semiarid Cool - Very Shallow  | 0 (0)  | 700 (100)   | 0 (0)  |
| Semiarid Cool - Breaks  | 0 (0)  | 600 (100)   | 0 (0)  |
| Semiarid Cool - Saline Uplands, Sandy Uplands, Loamy Uplands, Finer Uplands | 0 (0)  | 500 (100)   | 0 (0)  |
| Semiarid Warm - Clay Uplands  | 0 (0)  | 300 (100)   | 0 (0)  |
| Semiarid Warm - Gypsum  | 0 (0)  | 200 (100)   | 0 (0)  |
| Semiarid Cool - Bottoms   | 0 (0)  | 0 (0)   | 0 (0)  |
| Semiarid Cool - Sandy Bottoms   | 0 (0)  | 0 (0)   | 0 (0)  |
| Semiarid Cool - Clay Uplands  | 0 (0)  | 0 (0)   | 0 (0)  |
| <b>Grand Total</b>  | <b>1,500 (&lt;1)</b>                           | <b>1,863,200 (99)</b>   | <b>0 (0)</b>                                 |

Source: BLM GIS 2022

<sup>1</sup>Percentage of total ecological site group acreage in GSENM.

The BLM would continue to manage approximately 1,796,800 acres of vegetation as ERMA and 67,500 acres as SRMA (Table 3-12). These designations may concentrate impacts from recreation in these areas, but would also provide protections to vegetation communities by limiting or restricting impacts from recreation and surface-disturbing activities that would move vegetation away from desired conditions and lead to reduced resiliency, as described under *Impacts Common to All Alternatives*.

**Table 3-12. Ecological Site Groups in Recreation Management Areas under Alternative A**

| Ecological Site Groups                       | ERMA (Acres (% <sup>1</sup> )) | SRMA (Acres (% <sup>1</sup> )) |
|--|--------------------------------|--------------------------------|
| Arid Warm – Sandy Uplands, Loamy Uplands     | 345,800 (92)                   | 31,800 (8)                     |
| Arid Warm – Shallow                          | 297,900 (98)                   | 7,600 (2)                      |
| Arid Warm – Very Shallow                     | 276,300 (96)                   | 12,800 (4)                     |
| Semiarid Warm – Shallow, Deep Rocky          | 245,800 (98)                   | 6,300 (2)                      |
| Semiarid Warm – Sandy Uplands, Loamy Uplands | 185,300 (99)                   | 2,600 (1)                      |
| Semiarid Warm – Very Shallow                 | 77,600 (99)                    | 400 (1)                        |
| Arid Warm – Breaks                           | 69,700 (99)                    | 400 (1)                        |
| Outcrops                                     | 62,300 (99)                    | 500 (1)                        |
| Semiarid Warm – Finer Uplands                | 52,400 (98)                    | 1,000 (2)                      |
| Arid Warm – Deep Rocky                       | 46,100 (98)                    | 1,000 (2)                      |
| Semiarid Warm – Breaks                       | 30,600 (99)                    | 400 (1)                        |
| Arid Warm – Finer Uplands, Clay Uplands      | 25,100 (96)                    | 1,000 (4)                      |
| Arid Warm – Saline Uplands                   | 21,600 (99)                    | 200 (1)                        |
| Arid Warm – Sandy Bottoms                    | 17,300 (96)                    | 800 (4)                        |
| Arid Warm – Saline Hills                     | 11,300 (100)                   | 0 (0)                          |
| Arid Warm – Saline Bottoms, Bottoms          | 5,700 (95)                     | 300 (5)                        |
| Semiarid Warm – Sandy Bottoms, Bottoms       | 5,300 (96)                     | 200 (4)                        |
| Arid Warm – Gypsum                           | 4,400 (96)                     | 200 (4)                        |
| Riparian                                     | 3,200 (94)                     | 200 (6)                        |
| Semiarid Cool – Shallow                      | 3,000 (100)                    | 0 (0)                          |
| Semiarid Warm – Saline Hills                 | 2,400 (100)                    | 0 (0)                          |
| Semiarid Cool – Deep Rocky                   | 2,000 (100)                    | 0 (0)                          |

3. Affected Environment and Environmental Consequences (Vegetation, Including Special Status Plants)

| <b>Ecological Site Groups</b>  | <b>ERMA<br/>(Acres (%<sup>1</sup>))</b> | <b>SRMA<br/>(Acres (%<sup>1</sup>))</b> |
|--|---|---|
| Semiarid Warm – Saline Uplands   | 1,700 (100)                             | 0 (0)                                   |
| Semiarid Warm – Saline Bottoms   | 1,600 (100)                             | 0 (0)                                   |
| Semiarid Cool – Very Shallow   | 700 (100)                               | 0 (0)                                   |
| Semiarid Cool – Breaks   | 600 (100)                               | 0 (0)                                   |
| Semiarid Cool – Saline Uplands, Sandy Uplands,<br>Loamy Uplands, Finer Uplands | 500 (100)                               | 0 (0)                                   |
| Semiarid Warm – Clay Uplands   | 300 (100)                               | 0 (0)                                   |
| Semiarid Warm – Gypsum   | 200 (100)                               | 0 (0)                                   |
| <b>Grand Total</b>   | <b>1,796,800 (95)</b>                   | <b>67,500 (4)</b>                       |

Source: BLM GIS 2022

<sup>1</sup>Percentage of total ecological site group acreage in GSENM.

Approximately 881,200 acres of vegetation would continue to be in ROW exclusion areas under Alternative A (Table 3-13). These areas would continue to provide enhanced protection to vegetation communities and special status plant species by reducing impacts from surface-disturbing activities that reduce resiliency of vegetation, as described under *Impacts Common to All Alternatives*.

**Table 3-13. Ecological Site Groups in Right-of-Way Allocations under Alternative A**

| <b>Ecological Site Groups</b>  | <b>Open to ROW<br/>Authorization<br/>(Acres (%<sup>1</sup>))</b> | <b>ROW<br/>Avoidance Area<br/>(Acres (%<sup>1</sup>))</b> | <b>ROW<br/>Exclusion Area<br/>(Acres (%<sup>1</sup>))</b> |
|--|--|---|---|
| Arid Warm – Sandy Uplands, Loamy Uplands                                       | 154,500 (41)   | 48,500 (13)   | 168,700 (45)  |
| Arid Warm – Shallow  | 95,700 (31)  | 46,000 (15)   | 163,000 (53)  |
| Arid Warm – Very Shallow   | 73,500 (25)  | 58,900 (20)   | 156,700 (54)  |
| Semiarid Warm – Shallow, Deep Rocky  | 86,800 (34)  | 48,100 (19)   | 113,900 (45)  |
| Semiarid Warm – Sandy Uplands, Loamy<br>Uplands                                | 117,200 (62)   | 22,800 (12)   | 42,200 (22)   |
| Semiarid Warm – Very Shallow   | 11,400 (15)  | 23,200 (30)   | 43,500 (56)   |
| Arid Warm – Breaks   | 2,600 (4)  | 17,300 (25)   | 50,200 (72)   |
| Outcrops   | 10,800 (17)  | 13,400 (21)   | 38,600 (61)   |
| Semiarid Warm – Finer Uplands  | 31,300 (59)  | 5,500 (10)  | 14,500 (27)   |
| Arid Warm – Deep Rocky   | 10,900 (23)  | 11,700 (25)   | 24,600 (52)   |
| Semiarid Warm – Breaks   | 800 (3)  | 7,400 (24)  | 22,700 (73)   |
| Arid Warm – Finer Uplands, Clay Uplands  | 7,800 (30)   | 9,700 (37)  | 6,800 (26)  |
| Arid Warm – Saline Uplands   | 8,900 (41)   | 4,600 (21)  | 8,100 (37)  |
| Arid Warm – Sandy Bottoms  | 5,600 (31)   | 3,100 (17)  | 9,400 (52)  |
| Arid Warm – Saline Hills   | 5,900 (52)   | 1,600 (14)  | 3,800 (34)  |
| Arid Warm – Saline Bottoms, Bottoms  | 1,000 (17)   | 3,200 (53)  | 1,100 (18)  |
| Semiarid Warm – Sandy Bottoms, Bottoms   | 2,300 (42)   | 900 (16)  | 1,900 (35)  |
| Arid Warm – Gypsum   | 1,600 (35)   | 800 (17)  | 2,300 (50)  |
| Riparian   | 200 (6)  | 600 (18)  | 2,600 (76)  |
| Semiarid Cool – Shallow  | 100 (3)  | 600 (20)  | 2,200 (73)  |
| Semiarid Warm – Saline Hills   | 0 (0)  | 1,500 (63)  | 900 (38)  |
| Semiarid Cool – Deep Rocky   | 300 (15)   | 700 (35)  | 900 (45)  |
| Semiarid Warm – Saline Uplands   | 200 (12)   | 1,100 (65)  | 400 (24)  |
| Semiarid Warm – Saline Bottoms   | 200 (13)   | 700 (44)  | 700 (44)  |
| Semiarid Cool – Very Shallow   | 0 (0)  | 100 (14)  | 600 (86)  |
| Semiarid Cool – Breaks   | 0 (0)  | 100 (17)  | 500 (83)  |
| Semiarid Cool – Saline Uplands, Sandy<br>Uplands, Loamy Uplands, Finer Uplands | 200 (40)   | 200 (40)  | 100 (20)  |

| Ecological Site Groups       | Open to ROW<br>Authorization<br>(Acres (% <sup>1</sup> )) | ROW<br>Avoidance Area<br>(Acres (% <sup>1</sup> )) | ROW<br>Exclusion Area<br>(Acres (% <sup>1</sup> )) |
|------------------------------|---|--|--|
| Semiarid Warm – Clay Uplands | 100 (33)  | 0 (0)  | 200 (67)   |
| Semiarid Warm – Gypsum       | 100 (50)  | 100 (50)   | 100 (50)   |
| <b>Total Acres</b>           | <b>630,000 (34)</b>                                       | <b>332,400 (18)</b>                                | <b>881,200 (47)</b>                                |

Source: BLM GIS 2022

<sup>1</sup>Percentage of total ecological site group acreage in GSENM.

### Alternative B

Like Alternative A, vegetation management under Alternative B would facilitate large landscape-scale restoration projects using proactive management to increase vegetation community climate resiliency. This would help maintain the extent and function of vegetation communities in the longer term, as climate trends become more pronounced. It would also help move vegetation toward desired conditions by increasing biodiversity and resiliency of native vegetation communities. Because vegetation management often includes some level of vegetation removal and surface disturbance, short-term negative impacts on vegetation and special status species could occur. As described under *Impacts Common to All Alternatives*, the type of impact and intensity would vary based on treatment type. [Alternative B also includes management direction to use soil and biological soil crust resource conditions, desired conditions mapping, and information on hydrologic conditions and trends, as available, as a basis in the design of and rationale for vegetation management proposals. This direction would further ensure that vegetation treatments would be designed to increase the biodiversity and resiliency of vegetation communities. Alternative B also includes management direction to prioritize the use of vegetation management residues \(such as wood and other timber products left over after projects\) on-site or for other GSENM restoration activities whenever there is opportunity. This may help to enhance restoration project success. Vegetation management efforts would give preference to the use of native vegetation; however, nonnative vegetation may be used in restoration efforts to best support the recovery of site integrity and resilience. After vegetation management activities involving seeding \(such as fire rehabilitation, restoration, and nonstructural range improvement\), seeded areas would be rested from grazing for a minimum of two growing seasons and until site objectives are met. Vegetation monitoring data would be evaluated to determine when the objectives for the seedings are met and when grazing can be resumed. This direction would help ensure that seeding efforts would be successful.](#)

Additionally, this alternative includes management direction to complete land health assessments and causal factor determinations within the [nine](#) departed watersheds across GSENM within 2 years of signing the ROD. Based on the causal factor determinations, and within 5 years of the signing of the ROD, appropriate actions would be taken that would result in significant progress toward fulfillment of the land health standards. This would ensure that vegetation management would be carried out within the departed watersheds and that no large-scale impacts from discretionary [actions](#) (such as livestock grazing and recreation) would occur.

[Discretionary actions in reference plant communities would be prohibited, unless needed for removal of invasive weed species threatening intact communities, or to ensure biological integrity of these communities. This would offer more protection to these communities compared with Alternative A which only prohibits vegetation restoration efforts, camping, and campfires in these areas.](#)

Vegetation management and other actions would aim to maintain or restore native habitat to support sustainable populations of special status species. Discretionary actions that adversely impact the species would be avoided in special status species habitat unless the activity would protect and restore the habitat. These management directions would help to negate potential detrimental impacts to special status species and would offer greater protection to special status species than under Alternative A.

Under Alternative B, in addition to the allotments that are unavailable under Alternative A, allotments that do not have a current grazing permit would become unavailable for livestock grazing. The number of acres of ecological site groups that would be unavailable for livestock grazing under Alternative B is summarized in **Table 3-14**. Approximately 137,500 acres of vegetation in these areas would be protected from the effects of grazing, as described in *Impacts Common to All Alternatives*, with the largest number of acres occurring in the Arid Warm – Sandy Uplands, Loamy Uplands (39,400 acres) and Arid Warm – Shallow (27,800 acres) ecological site groups. As described in **Appendix I, Table I-6**, these ecological site groups are susceptible to annual invasion and woody encroachment; therefore, making them unavailable to livestock grazing would help reduce these issues. This alternative would help move vegetation toward desired conditions and increase resiliency of vegetation and special status species to a greater extent than under Alternative A by making more acres unavailable to grazing and by reducing AUMs by 2,961.

**Table 3-14. Ecological Site Groups Unavailable for Livestock Grazing under Alternatives B and C**

| Ecological Site Groups  | Unavailable for Livestock Grazing (Acres (% <sup>1</sup> )) |
|---|---|
| Arid Warm - Sandy Uplands, Loamy Uplands                                    | 39,400 (10)   |
| Arid Warm - Shallow   | 27,800 (9)  |
| Semiarid Warm - Shallow, Deep Rocky   | 19,000 (8)  |
| Arid Warm - Very Shallow  | 15,100 (5)  |
| Semiarid Warm - Sandy Uplands, Loamy Uplands                                | 7,400 (4)   |
| Semiarid Warm - Very Shallow  | 7,000 (9)   |
| Outcrops  | 5,500 (9)   |
| Arid Warm - Breaks  | 4,600 (7)   |
| Semiarid Warm - Finer Uplands   | 3,300 (6)   |
| Semiarid Warm - Breaks  | 1,800 (6)   |
| Riparian  | 1,300 (38)  |
| Arid Warm - Deep Rocky  | 1,200 (3)   |
| Arid Warm - Sandy Bottoms   | 900 (5)   |
| Semiarid Warm - Sandy Bottoms, Bottoms                                      | 800 (15)  |
| Arid Warm - Finer Uplands, Clay Uplands                                     | 400 (2)   |
| Arid Warm - Saline Uplands  | 400 (2)   |
| Semiarid Warm - Saline Uplands  | 400 (24)  |
| Semiarid Cool - Deep Rocky  | 300 (15)  |
| Arid Warm - Saline Bottoms, Bottoms   | 200 (3)   |
| Arid Warm - Saline Hills  | 200 (2)   |
| Semiarid Cool - Shallow   | 100 (3)   |
| Semiarid Warm - Saline Hills  | 100 (4)   |
| Semiarid Cool - Saline Uplands, Sandy Uplands, Loamy Uplands, Finer Uplands | 100 (20)  |

| Ecological Site Groups         | Unavailable for Livestock Grazing (Acres (% <sup>1</sup> )) |
|--------------------------------|---|
| Arid Warm - Gypsum             | 100 (2)   |
| Semiarid Warm - Saline Bottoms | 100 (6)   |
| <b>Grand Total</b>             | <b>137,500 (7)</b>  |

Source: BLM GIS 2022

<sup>1</sup>Percentage of total ecological site group acreage in GSENM.

The number of acres of ecological site groups that would be closed to OHV travel or limited to OHV designated routes under Alternative B is summarized in **Table 3-15**. Approximately 951,700 acres would be closed to OHV travel, and OHV travel would be limited to OHV designated routes in 913,000 acres (**Table 3-15**). Closing additional areas to OHV travel, compared with Alternative A, would provide enhanced protection to vegetation communities and special status species by reducing impacts from surface-disturbing activities, as described under *Impacts Common to All Alternatives*. Closing areas managed as limited under Alternative A would reduce vehicular travel on designated routes by reducing areas that could be considered for route designation in future TMP planning and, therefore, limit impacts on vegetation to a greater extent than under Alternative A. This would have the greatest beneficial impact on ecological site groups that are susceptible to erosion and annual invasion (see **Appendix I, Table I-6**) and have a large proportion of acres within the project area closed to OHV travel, such as the Arid Warm – Breaks (79 percent), Arid Warm – Very Shallow (60 percent), and Semiarid Cool – Very Shallow (86 percent) ecological site groups (**Table 3-15**).

**Table 3-15. Ecological Site Groups in Travel Management Areas under Alternative B**

| Ecological Site Groups                       | Closed to OHV Travel (Acres (% <sup>1</sup> )) | OHV Travel Limited to Designated Routes (Acres (% <sup>1</sup> )) |
|--|--|---|
| Arid Warm - Sandy Uplands, Loamy Uplands     | 182,400 (48)                                   | 195,200 (52)  |
| Arid Warm - Shallow                          | 178,300 (58)                                   | 127,200 (42)  |
| Arid Warm - Very Shallow                     | 172,100 (60)                                   | 117,000 (40)  |
| Semiarid Warm - Shallow, Deep Rocky          | 119,700 (47)                                   | 132,400 (53)  |
| Semiarid Warm - Sandy Uplands, Loamy Uplands | 44,500 (24)                                    | 143,500 (76)  |
| Semiarid Warm - Very Shallow                 | 46,700 (60)                                    | 31,400 (40)   |
| Arid Warm - Breaks                           | 55,600 (79)                                    | 14,500 (21)   |
| Outcrops                                     | 41,300 (66)                                    | 21,600 (34)   |
| Semiarid Warm - Finer Uplands                | 14,900 (28)                                    | 38,500 (72)   |
| Arid Warm - Deep Rocky                       | 26,800 (57)                                    | 20,300 (43)   |
| Semiarid Warm - Breaks                       | 23,700 (76)                                    | 7,300 (24)  |
| Arid Warm - Finer Uplands, Clay Uplands      | 7,500 (29)                                     | 18,600 (71)   |
| Arid Warm - Saline Uplands                   | 8,600 (39)                                     | 13,200 (61)   |
| Arid Warm - Sandy Bottoms                    | 10,600 (59)                                    | 7,600 (42)  |
| Arid Warm - Saline Hills                     | 4,000 (35)                                     | 7,300 (65)  |
| Arid Warm - Saline Bottoms, Bottoms          | 1,200 (20)                                     | 4,800 (80)  |
| Semiarid Warm - Sandy Bottoms, Bottoms       | 1,900 (35)                                     | 3,600 (65)  |
| Arid Warm - Gypsum                           | 2,300 (50)                                     | 2,300 (50)  |
| Riparian                                     | 2,900 (85)                                     | 500 (15)  |
| Semiarid Cool - Shallow                      | 2,200 (73)                                     | 800 (27)  |
| Semiarid Warm - Saline Hills                 | 900 (38)                                       | 1,400 (58)  |
| Semiarid Cool - Deep Rocky                   | 900 (45)                                       | 1,000 (50)  |
| Semiarid Warm - Saline Uplands               | 400 (24)                                       | 1,300 (76)  |

| Ecological Site Groups  | Closed to OHV Travel<br>(Acres (%)) | OHV Travel Limited to Designated Routes<br>(Acres (%)) |
|---|-------------------------------------|--|
| Semiarid Warm - Saline Bottoms  | 800 (50)                            | 800 (50)   |
| Semiarid Cool - Very Shallow  | 600 (86)                            | 100 (14)   |
| Semiarid Cool - Breaks  | 500 (83)                            | 100 (17)   |
| Semiarid Cool - Saline Uplands, Sandy Uplands, Loamy Uplands, Finer Uplands | 100 (20)                            | 400 (80)   |
| Semiarid Warm - Clay Uplands  | 200 (67)                            | 100 (33)   |
| Semiarid Warm - Gypsum  | 100 (50)                            | 200 (100)  |
| <b>Grand Total</b>  | <b>951,700 (51)</b>                 | <b>913,000 (49)</b>                                    |

Source: BLM GIS 2022

<sup>1</sup>Percentage of total ecological site group acreage in GSENM.

Under Alternative B, approximately 1,769,200 acres of ERMAs and 95,300 acres of SRMAs would overlap ecological site groups (**Table 3-16**). Impacts on vegetation and special status species from the designation of RMAs under Alternative B would be similar to Alternative A because the acres and management of RMAs are similar across these alternatives.

**Table 3-16. Ecological Site Groups in Recreation Management Areas under Alternative B**

| Ecological Site Groups  | ERMA<br>(Acres (%)) | SRMA<br>(Acres (%)) |
|---|---------------------|---------------------|
| Arid Warm – Sandy Uplands, Loamy Uplands                                    | 349,400 (93)        | 28,100 (7)          |
| Arid Warm – Shallow   | 286,900 (94)        | 27,900 (7)          |
| Arid Warm – Very Shallow  | 266,000 (92)        | 18,500 (6)          |
| Semiarid Warm – Shallow, Deep Rocky   | 249,200 (99)        | 23,000 (8)          |
| Semiarid Warm – Sandy Uplands, Loamy Uplands                                | 188,400 (100)       | 2,600 (1)           |
| Semiarid Warm – Very Shallow  | 75,700 (97)         | 700 (0)             |
| Arid Warm – Breaks  | 65,800 (94)         | 2,100 (3)           |
| Outcrops  | 56,600 (90)         | 4,300 (6)           |
| Semiarid Warm – Finer Uplands   | 53,400 (100)        | 6,200 (10)          |
| Arid Warm – Deep Rocky  | 44,900 (95)         | 100 (0)             |
| Semiarid Warm – Breaks  | 30,200 (97)         | 2,100 (4)           |
| Arid Warm – Finer Uplands, Clay Uplands                                     | 25,000 (96)         | 600 (2)             |
| Arid Warm – Saline Uplands  | 20,700 (95)         | 1,200 (5)           |
| Arid Warm – Sandy Bottoms   | 15,700 (87)         | 1,100 (5)           |
| Arid Warm – Saline Hills  | 11,000 (97)         | 2,500 (14)          |
| Arid Warm – Saline Bottoms, Bottoms   | 5,500 (92)          | 300 (3)             |
| Semiarid Warm – Sandy Bottoms, Bottoms                                      | 5,400 (98)          | 600 (10)            |
| Arid Warm – Gypsum  | 3,800 (83)          | 0 (0)               |
| Riparian  | 2,700 (79)          | 800 (17)            |
| Semiarid Cool – Shallow   | 3,000 (100)         | 0 (0)               |
| Semiarid Warm – Saline Hills  | 2,400 (100)         | 0 (0)               |
| Semiarid Cool – Deep Rocky  | 2,000 (100)         | 0 (0)               |
| Semiarid Warm – Saline Uplands  | 1,700 (100)         | 0 (0)               |
| Semiarid Warm – Saline Bottoms  | 1,600 (100)         | 0 (0)               |
| Semiarid Cool – Very Shallow  | 700 (100)           | 0 (0)               |
| Semiarid Cool – Breaks  | 600 (100)           | 0 (0)               |
| Semiarid Cool – Saline Uplands, Sandy Uplands, Loamy Uplands, Finer Uplands | 500 (100)           | 0 (0)               |
| Semiarid Warm – Clay Uplands  | 300 (100)           | 0 (0)               |

| Ecological Site Groups | ERMA<br>(Acres (% <sup>1</sup> )) | SRMA<br>(Acres (% <sup>1</sup> )) |
|------------------------|-----------------------------------|-----------------------------------|
| Semiarid Warm – Gypsum | 200 (100)                         | 0 (0)                             |
| <b>Grand Total</b>     | <b>1,769,200 (94)</b>             | <b>95,300 (5)</b>                 |

Source: BLM GIS 2022

<sup>1</sup>Percentage of total ecological site group acreage in GSENM.

The number of acres of ecological site groups that would be in each type of ROW allocation under Alternative B is summarized in **Table 3-17**. The number of acres that would be managed as ROW exclusion areas is **less than the** number under Alternative A, so the beneficial impacts on vegetation and special status species from restricting ROW development would be **to a lesser degree than under** Alternative A. However, the number of acres that would be open to ROW authorization would be greatly reduced under this alternative, compared with Alternative A. This would restrict the potential for ROW development in these areas, which would have the greatest benefit to vegetation within ecological site groups whose proportion of acres open to ROW authorization is significantly reduced under this alternative. For example, 58 percent less of the Semiarid Warm – Sandy Uplands, Loamy Uplands Ecological Site Group and 52 percent less of the Semiarid Warm – Finer Uplands Ecological Site Group would be open to ROW authorization, compared with Alternative A.

**Table 3-17. Ecological Site Groups in Right-of-way Allocations under Alternative B**

| Ecological Site Groups                       | Open to ROW<br>Authorization<br>(Acres (% <sup>1</sup> )) | ROW Avoidance<br>Area<br>(Acres (% <sup>1</sup> )) | ROW Exclusion<br>Area<br>(Acres (% <sup>1</sup> )) |
|--|---|--|--|
| Arid Warm – Sandy Uplands, Loamy Uplands     | 17,600 (5)  | 178,000 (47)                                       | 179,200 (47)                                       |
| Arid Warm – Shallow                          | 9,400 (3)   | 115,200 (38)                                       | 180,300 (59)                                       |
| Arid Warm – Very Shallow                     | 11,200 (4)  | 106,600 (37)                                       | 171,400 (59)                                       |
| Semiarid Warm – Shallow, Deep Rocky          | 14,800 (6)  | 116,800 (46)                                       | 118,300 (47)                                       |
| Semiarid Warm – Sandy Uplands, Loamy Uplands | 7,400 (4)   | 131,700 (70)                                       | 44,200 (24)  |
| Semiarid Warm – Very Shallow                 | 4,200 (5)   | 28,500 (36)  | 45,400 (58)  |
| Arid Warm – Breaks                           | 1,600 (2)   | 12,500 (18)  | 56,000 (80)  |
| Outcrops                                     | 2,200 (3)   | 20,400 (32)  | 40,200 (64)  |
| Semiarid Warm – Finer Uplands                | 4,000 (7)   | 32,900 (61)  | 14,900 (28)  |
| Arid Warm – Deep Rocky                       | 1,200 (3)   | 17,800 (38)  | 28,000 (59)  |
| Semiarid Warm – Breaks                       | 1,200 (4)   | 6,500 (21)   | 23,300 (75)  |
| Arid Warm – Finer Uplands, Clay Uplands      | 2,700 (10)  | 15,200 (58)  | 7,600 (29)   |
| Arid Warm – Saline Uplands                   | 1,500 (7)   | 11,800 (54)  | 8,500 (39)   |
| Arid Warm – Sandy Bottoms                    | 1,200 (7)   | 6,700 (37)   | 10,300 (57)  |
| Arid Warm – Saline Hills                     | 500 (4)   | 6,900 (61)   | 4,000 (35)   |
| Arid Warm – Saline Bottoms, Bottoms          | 700 (12)  | 3,800 (63)   | 1,200 (20)   |
| Semiarid Warm – Sandy Bottoms, Bottoms       | 700 (13)  | 2,700 (49)   | 1,800 (33)   |
| Arid Warm – Gypsum                           | 300 (7)   | 2,100 (46)   | 2,200 (48)   |
| Riparian                                     | 300 (9)   | 400 (12)   | 2,700 (79)   |
| Semiarid Cool – Shallow                      | 100 (3)   | 700 (23)   | 2,200 (73)   |
| Semiarid Warm – Saline Hills                 | 800 (33)  | 900 (38)   | 600 (25)   |
| Semiarid Cool – Deep Rocky                   | 200 (10)  | 800 (40)   | 900 (45)   |
| Semiarid Warm – Saline Uplands               | 500 (29)  | 800 (47)   | 300 (18)   |
| Semiarid Warm – Saline Bottoms               | 400 (25)  | 600 (38)   | 600 (38)   |
| Semiarid Cool – Very Shallow                 | 0 (0)   | 100 (14)   | 600 (86)   |
| Semiarid Cool – Breaks                       | 100 (17)  | 100 (17)   | 400 (67)   |



| Ecological Site Groups  | Open to ROW Authorization<br>(Acres (% <sup>1</sup> )) | ROW Avoidance Area<br>(Acres (% <sup>1</sup> )) | ROW Exclusion Area<br>(Acres (% <sup>1</sup> )) |
|---|--|---|---|
| Semiarid Cool – Saline Uplands, Sandy Uplands, Loamy Uplands, Finer Uplands | 0 (0)  | 300 (60)  | 100 (20)  |
| Semiarid Warm – Clay Uplands  | 0 (0)  | 100 (33)  | 200 (67)  |
| Semiarid Warm – Gypsum  | 0 (0)  | 100 (50)  | 100 (50)  |
| <b>Grand Total</b>  | <b>84,800 (5)</b>                                      | <b>821,000 (44)</b>                             | <b>945,500 (51)</b>                             |

Source: BLM GIS 2022

<sup>1</sup>Percentage of total ecological site group acreage in GSENM.

### Alternative C

Vegetation management under Alternative C would use an area management approach where the front country, passage, and outback areas would focus on proactive management, while the primitive area would focus on natural processes. Proactive management in the front, passage, and outback areas would help move vegetation toward desired conditions at a faster rate than natural processes. The relative speed and efficacy of movement toward desired conditions would vary depending on the treatment method or combination of treatment methods, as described above in the *Impacts Common to All Alternatives*. In the front, passage, and outback areas, vegetation management and other actions would aim to maintain or restore native habitat to support sustainable populations of special status species. In the primitive area, vegetation management and other actions would aim to maintain, enhance, and/or restore native habitat. This direction would help to negate potential detrimental impacts to special status species. Areas where vegetation has been degraded by invasive annual grass expansion, fire suppression, or excessive livestock grazing may not be able to return to its previous state, or desired conditions, without active management (Briske et al. 2006). Therefore, desired conditions for vegetation in the primitive area may not be achievable under this alternative and may lead to less resilient vegetation in these areas.

Like Alternative B, Alternative C also includes management direction to use soil and biological soil crust resource conditions, desired conditions mapping, and information on hydrologic conditions and trends, as available, as a basis in the design of and rationale for vegetation management proposals. This direction would further ensure that vegetation treatments would be designed to increase the biodiversity and resiliency of vegetation communities.

After vegetation management activities involving seeding (such as fire rehabilitation, restoration, and nonstructural range improvement), seeded areas would be rested from grazing for a minimum of two growing seasons and until site objectives are met. Vegetation monitoring data would be evaluated to determine when the objectives for the seedings are met and when grazing can be resumed. This direction would help ensure that seeding efforts would be successful. Management of vegetation management residues would be the same as under Alternative B.

This alternative also includes the same management direction to complete land health assessments and causal determinations as under Alternative B, which would help reduce large-scale impacts on vegetation from discretionary actions across the nine HUC-10 and HUC-12 departed watersheds. Impacts to reference plant communities would be the same as under Alternative B.

The number of acres of ecological site groups that would be unavailable for livestock grazing under Alternative C is the same as under Alternative B, which is summarized in **Table 3-14**. Under Alternative C, like Alternative B, allotments that do not have a current grazing permit would become unavailable for

livestock grazing. Therefore, impacts from grazing on vegetation and special status plant species within GSENM under Alternative C would have the same substantial beneficial protections to vegetation as Alternative B and substantially more than Alternative A.

The number of acres of ecological site groups that would be closed and limited to designated routes under Alternative C is summarized in **Table 3-18**. Approximately 1,208,800 acres and the majority (more than 50 percent) of most ecological site groups in the GSENM would be closed to OHV travel (**Table 3-18**). These areas would provide enhanced protection to vegetation communities and special status species by reducing impacts from surface-disturbing activities, as described under *Impacts Common to All Alternatives*. Closing previously designated limited areas would reduce vehicular travel on designated routes by reducing areas that could be considered for route designation in future TMP planning and, therefore, limit impacts on vegetation and special status species that lead to reduced resiliency to a greater extent than under Alternative A.

**Table 3-18. Ecological Site Groups in Travel Management Areas under Alternative C**

| Ecological Site Groups   | Closed to OHV Travel<br>(Acres (% <sup>1</sup> )) | OHV Travel Limited<br>to Designated Routes<br>(Acres (% <sup>1</sup> )) |
|--|---|---|
| Arid Warm - Sandy Uplands, Loamy Uplands                                       | 221,500 (59)                                      | 156,100 (41)  |
| Arid Warm - Shallow  | 228,500 (75)                                      | 77,000 (25)   |
| Arid Warm - Very Shallow   | 231,200 (80)                                      | 57,900 (20)   |
| Semiarid Warm - Shallow, Deep Rocky  | 151,300 (60)                                      | 100,900 (40)  |
| Semiarid Warm - Sandy Uplands, Loamy Uplands                                   | 49,200 (26)                                       | 138,800 (74)  |
| Semiarid Warm - Very Shallow   | 54,700 (70)                                       | 23,300 (30)   |
| Arid Warm - Breaks   | 67,700 (97)                                       | 2,400 (3)   |
| Outcrops   | 54,700 (87)                                       | 8,100 (13)  |
| Semiarid Warm - Finer Uplands  | 19,700 (37)                                       | 33,800 (63)   |
| Arid Warm - Deep Rocky   | 35,800 (76)                                       | 11,300 (24)   |
| Semiarid Warm - Breaks   | 26,600 (86)                                       | 4,300 (14)  |
| Arid Warm - Finer Uplands, Clay Uplands  | 9,300 (36)  | 16,800 (64)   |
| Arid Warm - Saline Uplands   | 16,900 (78)                                       | 4,900 (22)  |
| Arid Warm - Sandy Bottoms  | 13,600 (75)                                       | 4,500 (25)  |
| Arid Warm - Saline Hills   | 9,500 (84)  | 1,900 (17)  |
| Arid Warm - Saline Bottoms, Bottoms  | 1,800 (30)  | 4,200 (70)  |
| Semiarid Warm - Sandy Bottoms, Bottoms   | 2,500 (45)  | 3,000 (55)  |
| Arid Warm - Gypsum   | 3,300 (72)  | 1,300 (28)  |
| Riparian   | 3,100 (91)  | 300 (9)   |
| Semiarid Cool - Shallow  | 2,400 (80)  | 600 (20)  |
| Semiarid Warm - Saline Hills   | 1,000 (42)  | 1,400 (58)  |
| Semiarid Cool - Deep Rocky   | 1,400 (70)  | 500 (25)  |
| Semiarid Warm - Saline Uplands   | 400 (24)  | 1,200 (71)  |
| Semiarid Warm - Saline Bottoms   | 800 (50)  | 700 (44)  |
| Semiarid Cool - Very Shallow   | 700 (100)   | 0 (0)   |
| Semiarid Cool - Breaks   | 500 (83)  | 100 (17)  |
| Semiarid Cool - Saline Uplands, Sandy Uplands,<br>Loamy Uplands, Finer Uplands | 400 (80)  | 100 (20)  |
| Semiarid Warm - Clay Uplands   | 200 (67)  | 100 (33)  |
| Semiarid Warm - Gypsum   | 100 (50)  | 100 (50)  |
| <b>Grand Total</b>   | <b>1,208,800 (65)</b>                             | <b>655,600 (35)</b>   |

Source: BLM GIS 2022

<sup>1</sup>Percentage of total ecological site group acreage in GSENM.

Under Alternative C, the BLM would manage approximately 486,100 acres of vegetation as ERMA and 417,100 acres as SRMAs (Table 3-19). While fewer acres would be managed as RMAs, there would be more restrictions on recreation group sizes, camping and campfires, and the development of facilities that could lead to an decrease in the degradation of vegetation communities, compared with Alternative A. In general, management for the front country, passage, and outback areas would be less limiting while the primitive area would have more restrictions. These restrictions in the primitive area would reduce impacts that recreational activities would have on vegetation and special status species in those areas.

**Table 3-19. Ecological Site Groups in Recreation Management Areas under Alternative C**

| Ecological Site Groups                       | ERMA<br>(Acres (% <sup>1</sup> )) | SRMA<br>(Acres (% <sup>1</sup> )) |
|--|-----------------------------------|-----------------------------------|
| Arid Warm – Sandy Uplands, Loamy Uplands     | 121,000 (32)                      | 156,700 (41)                      |
| Semiarid Warm – Sandy Uplands, Loamy Uplands | 99,300 (53)                       | 38,200 (20)                       |
| Arid Warm – Shallow                          | 54,700 (18)                       | 76,600 (25)                       |
| Semiarid Warm – Shallow, Deep Rocky          | 84,900 (34)                       | 31,900 (13)                       |
| Arid Warm – Very Shallow                     | 45,100 (16)                       | 55,500 (19)                       |
| Semiarid Warm – Finer Uplands                | 25,200 (47)                       | 800 (1)                           |
| Semiarid Warm – Very Shallow                 | 12,100 (15)                       | 13,300 (17)                       |
| Outcrops                                     | 4,400 (7)                         | 13,200 (21)                       |
| Arid Warm – Breaks                           | 4,500 (6)                         | 9,300 (13)                        |
| Semiarid Warm – Breaks                       | 8,300 (27)                        | 3,900 (13)                        |
| Arid Warm – Finer Uplands, Clay Uplands      | 10,100 (39)                       | 1,700 (7)                         |
| Arid Warm – Deep Rocky                       | 6,300 (13)                        | 3,900 (8)                         |
| Arid Warm – Sandy Bottoms                    | 2,100 (12)                        | 5,000 (28)                        |
| Arid Warm – Saline Uplands                   | 2,700 (12)                        | 1,900 (9)                         |
| Arid Warm – Saline Bottoms, Bottoms          | 1,900 (32)                        | 800 (13)                          |
| Riparian                                     | 300 (9)                           | 2,000 (59)                        |
| Arid Warm – Gypsum                           | 800 (17)                          | 1,500 (33)                        |
| Semiarid Warm – Sandy Bottoms, Bottoms       | 1,700 (31)                        | 500 (9)                           |
| Arid Warm – Saline Hills                     | 700 (6)                           | 400 (4)                           |
| Semiarid Warm – Clay Uplands                 | 200 (67)                          | 0 (0)                             |
| Semiarid Warm – Gypsum                       | 0 (0)                             | 0 (0)                             |
| Semiarid Warm – Saline Uplands               | 100 (6)                           | 0 (0)                             |
| <b>Grand Total</b>                           | <b>486,100 (26)</b>               | <b>417,100 (22)</b>               |

Source: BLM GIS 2022

<sup>1</sup>Percentage of total ecological site group acreage in GSENM.

The number of acres of ecological site groups that would be in each type of ROW allocation under Alternative C is summarized in Table 3-20. The majority of most ecological site groups in the GSENM would be in ROW exclusion areas (Table 3-20). Compared with Alternative A, this would offer more protection to vegetation and special status species and reduce impacts associated with ROWs, as described under *Impacts Common to All Alternatives*.

**Table 3-20. Ecological Site Groups in Right-of-way Allocations under Alternative C**

| Ecological Site Groups  | Open to ROW Authorization (Acres (% <sup>1</sup> )) | ROW Avoidance Area (Acres (% <sup>1</sup> )) | ROW Exclusion Area (Acres (% <sup>1</sup> )) |
|---|---|--|--|
| Arid Warm – Sandy Uplands, Loamy Uplands                                    | 1,700 (0)   | 164,500 (44)                                 | 205,900 (55)                                 |
| Arid Warm – Shallow   | 600 (0)   | 81,200 (27)                                  | 222,900 (73)                                 |
| Arid Warm – Very Shallow  | 2,200 (1)   | 60,100 (21)                                  | 226,900 (78)                                 |
| Semiarid Warm – Shallow, Deep Rocky   | 3,400 (1)   | 105,000 (42)                                 | 140,800 (56)                                 |
| Semiarid Warm – Sandy Uplands, Loamy Uplands                                | 1,600 (1)   | 132,600 (71)                                 | 48,200 (26)                                  |
| Semiarid Warm – Very Shallow  | 100 (0)   | 25,400 (33)                                  | 52,600 (67)                                  |
| Arid Warm – Breaks  | 100 (0)   | 2,300 (3)                                    | 67,800 (97)                                  |
| Outcrops  | 0 (0)   | 8,500 (14)                                   | 54,300 (86)                                  |
| Semiarid Warm – Finer Uplands   | 500 (1)   | 32,700 (61)                                  | 18,300 (34)                                  |
| Arid Warm – Deep Rocky  | 100 (0)   | 12,400 (26)                                  | 34,600 (73)                                  |
| Semiarid Warm – Breaks  | 0 (0)   | 4,500 (15)                                   | 26,400 (85)                                  |
| Arid Warm – Finer Uplands, Clay Uplands                                     | 200 (1)   | 14,900 (57)                                  | 9,300 (36)                                   |
| Arid Warm – Saline Uplands  | 0 (0)   | 5,900 (27)                                   | 15,700 (72)                                  |
| Arid Warm – Sandy Bottoms   | 100 (1)   | 4,700 (26)                                   | 13,400 (74)                                  |
| Arid Warm – Saline Hills  | 0 (0)   | 2,200 (19)                                   | 9,200 (81)                                   |
| Arid Warm – Saline Bottoms, Bottoms   | 200 (3)   | 3,900 (65)                                   | 1,400 (23)                                   |
| Semiarid Warm – Sandy Bottoms, Bottoms                                      | 100 (2)   | 2,700 (49)                                   | 2,400 (44)                                   |
| Arid Warm – Gypsum  | 0 (0)   | 1,600 (35)                                   | 3,000 (65)                                   |
| Riparian  | 0 (0)   | 300 (9)                                      | 3,100 (91)                                   |
| Semiarid Cool – Shallow   | 0 (0)   | 700 (23)                                     | 2,300 (77)                                   |
| Semiarid Warm – Saline Hills  | 0 (0)   | 1,400 (58)                                   | 1,000 (42)                                   |
| Semiarid Cool – Deep Rocky  | 0 (0)   | 1,000 (50)                                   | 1,000 (50)                                   |
| Semiarid Warm – Saline Uplands  | 0 (0)   | 1,200 (71)                                   | 400 (24)                                     |
| Semiarid Warm – Saline Bottoms  | 0 (0)   | 700 (44)                                     | 800 (50)                                     |
| Semiarid Cool – Very Shallow  | 0 (0)   | 100 (14)                                     | 600 (86)                                     |
| Semiarid Cool – Breaks  | 0 (0)   | 100 (17)                                     | 500 (83)                                     |
| Semiarid Cool – Saline Uplands, Sandy Uplands, Loamy Uplands, Finer Uplands | 0 (0)   | 300 (60)                                     | 100 (20)                                     |
| Semiarid Warm – Clay Uplands  | 0 (0)   | 100 (33)                                     | 200 (67)                                     |
| Semiarid Warm – Gypsum  | 0 (0)   | 100 (50)                                     | 100 (50)                                     |
| <b>Grand Total</b>  | <b>10,900 (1)</b>                                   | <b>671,100 (36)</b>                          | <b>1,163,200 (62)</b>                        |

Source: BLM GIS 2022

<sup>1</sup>Percentage of total ecological site group acreage in GSENM.**Alternative D**

Vegetation management under Alternative D would prioritize natural processes and techniques, compared to proactive management under Alternatives A and B, and to an extent Alternative C which allows for proactive restoration in the front country, passage, and outback areas. Natural processes and techniques are largely hands off and would result in less restorative changes in vegetation than Alternatives A, B, C, and E. Alternative D would also preclude using prescribed fire in many areas because prescribed fire likely cannot be used without mechanical pretreatments in much of the GSENM. The prioritization of natural processes would likely reduce the number of restoration projects that use active management and would instead rely on passive management. The limiting of active management would reduce the short-term direct impacts those projects would have on vegetation and special status plant species, such as increased

trampling and crushing and increased erosion, as described under *Impacts Common to All Alternatives*. However, the reduction in these projects may also adversely impact vegetation communities and special status species in the long term. The reliance on passive management could increase the establishment of noxious and invasive species if certain tools and techniques were not authorized to be used. Studies have shown that in some circumstances, such as after wildfire, using passive restoration can lead to high levels of woody fuels that can result in unnaturally high-intensity fires that can cause more severe damage to vegetation communities, compared with natural fire regimes (Forest Service 2022). Additionally, the reliance on natural processes may lead to restoration projects requiring longer time to achieve desired conditions compared to active management. In some cases, such as in areas that have been degraded by invasive annual grasses, fire suppression, or excessive livestock grazing, desired conditions for vegetation may not be met without active management (Briske et al. 2006). Restricting revegetation to native plant materials could increase the cover of native species in project areas, increasing plant community diversity, structure, and function. In some situations, however, native species may not compete well in areas with invasive annual grasses (Miller et al. 2015) or nonnative perennial grasses. Revegetation with native plant materials in these areas without pre- and/or post-chemical treatments of invasive annual grasses and nonnative perennial grasses would likely result in the treatment area being reinvaded by these species or would require the use of more invasive mechanical methods, such as tilling, increasing the necessity for multiple treatments and slowing movement toward desired conditions where treatments were done. Vegetation communities without invasive annual grasses as a component of the plant community and buffered from areas where invasive annual grasses occur would be optimal for manual or mechanical planting treatments. Augmentation with native plant material would provide the opportunity to increase plant communities' resistance and resilience by increasing diversity, structure and function, vigor, and overall health. [The use of nonnative vegetation may be approved in phased restoration efforts that lead towards a native vegetation community or for emergency actions where native vegetation is not reasonably available.](#)

[Like Alternative B, Alternative D also includes management direction to use soil and biological soil crust resource conditions, desired conditions mapping, and information on hydrologic conditions and trends, as available, as a basis in the design of and rationale for vegetation management proposals. This direction would further ensure that vegetation treatments would be designed to increase the biodiversity and resiliency of vegetation communities. After vegetation management activities involving seeding \(such as fire rehabilitation, restoration, and nonstructural range improvement\), seeded areas would be rested from grazing for a minimum of two growing seasons and until site objectives are met. Vegetation monitoring data would be evaluated to determine when the objectives for the seedings are met and when grazing can be resumed. This direction would help ensure that seeding efforts would be successful. Management of vegetation management residues would be the same as under Alternative B.](#)

Alternative D also includes the management direction to complete land health assessments and, if needed, causal factor determinations across GSENM within 10 years of signing the ROD. This would help ensure that land health standards and movement toward vegetation desired conditions are being met to a greater extent than under Alternative A, which includes no such direction. [Impacts to reference plant communities would be the same as under Alternative B. Vegetation management and other actions would aim to maintain, enhance, and/or restore native habitat to support sustainable populations of special status species, prioritizing natural processes and techniques over other methods. Discretionary actions that adversely impact the species would be prohibited in special status species habitat unless the activity would protect, restore, and/or enhance the habitat. These management directions would help to negate potential](#)

detrimental impacts to special status species and would offer greater protection and beneficial effects to special status species compared to the other alternatives.

Under Alternative D, in addition to the allotments that are unavailable under Alternative C, allotments within departed watersheds, per the long-term trends in AIM parameters in HUC 10 watersheds that overlap with GSENM, would be unavailable. This would add approximately 1,199,100 acres as unavailable for grazing and reduce AUMs by 64,025 as compared to Alternative A (Table 2-1). Within the boundaries of GSENM, approximately 1,193,500 acres and the majority (more than 50 percent) of most ecological site groups would be unavailable to grazing (Table 3-21). Compared with Alternative A, this reduction in AUMs and acres available for livestock would reduce the potential for impacts on vegetation and special status species from surface disturbance through improper grazing practices and range improvements. Reducing the number of allotment permittees under Alternative D would also reduce funding opportunities available from nonfederal agencies and organizations to complete habitat-improvement projects, potentially reducing opportunity to implement range improvement projects that would help mitigate the impacts of grazing, compared to Alternatives A, B, and C. However, because these types of projects occur infrequently, and other sources of funding would still be available, analysis of effects on vegetation is difficult to quantify.

**Table 3-21. Ecological Site Groups Unavailable for Livestock Grazing under Alternative D**

| Ecological Site Groups   | Unavailable for<br>Livestock Grazing<br>(Acres (% <sup>1</sup> )) |
|--|---|
| Arid Warm - Sandy Uplands, Loamy Uplands                                       | 196,400 (52)  |
| Arid Warm - Shallow  | 193,100 (63)  |
| Semiarid Warm - Shallow, Deep Rocky  | 174,400 (69)  |
| Arid Warm - Very Shallow   | 173,300 (60)  |
| Semiarid Warm - Sandy Uplands, Loamy Uplands                                   | 152,800 (81)  |
| Semiarid Warm - Very Shallow   | 64,600 (83)   |
| Outcrops   | 40,500 (64)   |
| Arid Warm - Breaks   | 39,300 (56)   |
| Arid Warm - Deep Rocky   | 31,400 (67)   |
| Semiarid Warm - Finer Uplands  | 31,300 (59)   |
| Arid Warm - Finer Uplands, Clay Uplands  | 21,500 (82)   |
| Semiarid Warm - Breaks   | 18,600 (60)   |
| Arid Warm - Saline Uplands   | 12,700 (58)   |
| Arid Warm - Sandy Bottoms  | 10,600 (59)   |
| Arid Warm - Saline Hills   | 7,000 (62)  |
| Arid Warm - Saline Bottoms, Bottoms  | 5,100 (85)  |
| Semiarid Warm - Sandy Bottoms, Bottoms   | 4,400 (80)  |
| Riparian   | 2,800 (82)  |
| Semiarid Cool - Shallow  | 2,500 (83)  |
| Semiarid Warm - Saline Hills   | 2,400 (100)   |
| Arid Warm - Gypsum   | 2,100 (46)  |
| Semiarid Warm - Saline Uplands   | 1,700 (100)   |
| Semiarid Cool - Deep Rocky   | 1,600 (80)  |
| Semiarid Warm - Saline Bottoms   | 1,600 (100)   |
| Semiarid Cool - Very Shallow   | 700 (100)   |
| Semiarid Cool - Breaks   | 500 (83)  |
| Semiarid Cool - Saline Uplands, Sandy Uplands, Loamy Uplands,<br>Finer Uplands | 300 (60)  |

| Ecological Site Groups       | Unavailable for Livestock Grazing (Acres (% <sup>1</sup> )) |
|------------------------------|---|
| Semiarid Warm - Gypsum       | 200 (100)   |
| Semiarid Warm - Clay Uplands | 100 (33)  |
| <b>Total Acres</b>           | <b>1,193,500 (64)</b>                                       |

Source: BLM GIS 2022

<sup>1</sup>Percentage of total ecological site group acreage in GSENM.

The number of acres of ecological site groups that would be closed, limited to designated routes under Alternative D is summarized in **Table 3-22**. Approximately 1,437,400 acres and the majority (more than 50 percent) of most ecological site groups in the GSENM would be closed to OHV travel, the most of any alternative (**Table 3-22**). These areas would provide enhanced protection to vegetation communities and special status species by reducing impacts from surface-disturbing activities, as described under *Impacts Common to All Alternatives*. Closing previously designated limited areas would reduce vehicular travel on designated routes and, therefore, limit impacts on vegetation and special status species to a greater extent than under Alternatives A, B, or C.

**Table 3-22. Ecological Site Groups in Travel Management Areas under Alternative D**

| Ecological Site Groups  | Closed (Acres (% <sup>1</sup> )) | Limited (Acres (% <sup>1</sup> )) |
|---|----------------------------------|-----------------------------------|
| Arid Warm - Sandy Uplands, Loamy Uplands                                    | 313,200 (83)                     | 64,400 (17)                       |
| Arid Warm - Shallow   | 273,600 (90)                     | 31,900 (10)                       |
| Arid Warm - Very Shallow  | 259,600 (90)                     | 29,600 (10)                       |
| Semiarid Warm - Shallow, Deep Rocky   | 166,600 (66)                     | 85,500 (34)                       |
| Semiarid Warm - Sandy Uplands, Loamy Uplands                                | 66,700 (35)                      | 121,200 (65)                      |
| Semiarid Warm - Very Shallow  | 59,700 (76)                      | 18,400 (24)                       |
| Arid Warm - Breaks  | 67,000 (96)                      | 3,100 (4)                         |
| Outcrops  | 58,200 (93)                      | 4,600 (7)                         |
| Semiarid Warm - Finer Uplands   | 26,400 (49)                      | 27,000 (50)                       |
| Arid Warm - Deep Rocky  | 42,700 (91)                      | 4,400 (9)                         |
| Semiarid Warm - Breaks  | 27,000 (87)                      | 3,900 (13)                        |
| Arid Warm - Finer Uplands, Clay Uplands                                     | 15,700 (60)                      | 10,400 (40)                       |
| Arid Warm - Saline Uplands  | 15,900 (73)                      | 5,900 (27)                        |
| Arid Warm - Sandy Bottoms   | 15,500 (86)                      | 2,600 (14)                        |
| Arid Warm - Saline Hills  | 7,600 (67)                       | 3,700 (33)                        |
| Arid Warm - Saline Bottoms, Bottoms   | 3,300 (55)                       | 2,700 (45)                        |
| Semiarid Warm - Sandy Bottoms, Bottoms                                      | 2,900 (53)                       | 2,600 (47)                        |
| Arid Warm - Gypsum  | 3,600 (78)                       | 1,000 (22)                        |
| Riparian  | 3,200 (94)                       | 200 (6)                           |
| Semiarid Cool - Shallow   | 2,400 (80)                       | 600 (20)                          |
| Semiarid Warm - Saline Hills  | 1,400 (58)                       | 900 (38)                          |
| Semiarid Cool - Deep Rocky  | 1,500 (75)                       | 500 (25)                          |
| Semiarid Warm - Saline Uplands  | 700 (41)                         | 1,000 (59)                        |
| Semiarid Warm - Saline Bottoms  | 1,100 (69)                       | 500 (31)                          |
| Semiarid Cool - Very Shallow  | 700 (100)                        | 0 (0)                             |
| Semiarid Cool - Breaks  | 500 (83)                         | 100 (17)                          |
| Semiarid Cool - Saline Uplands, Sandy Uplands, Loamy Uplands, Finer Uplands | 400 (80)                         | 100 (20)                          |
| Semiarid Warm - Clay Uplands  | 200 (67)                         | 100 (33)                          |

| Ecological Site Groups | Closed<br>(Acres (% <sup>1</sup> )) | Limited<br>(Acres (% <sup>1</sup> )) |
|------------------------|-------------------------------------|--------------------------------------|
| Semiarid Warm - Gypsum | 100 (50)                            | 100 (50)                             |
| <b>Grand Total</b>     | <b>1,437,400 (77)</b>               | <b>427,000 (23)</b>                  |

Source: BLM GIS 2022

<sup>1</sup>Percentage of total ecological site group acreage in GSENM.

Under Alternative D, the BLM would manage approximately 312,000 acres of vegetation as ERMA and 100,100 acres as SRMA (Table 3-23). With fewer restrictions on recreation, there is potential that greater group sizes, less restriction on camping and campfires, and the development of facilities could lead to an increase in the degradation of and reduced resiliency of vegetation communities and impacts on special status plant species, compared with Alternative A.

**Table 3-23. Ecological Site Groups in Recreation Management Areas under Alternative D**

| Ecological Site Groups                       | ERMA<br>(Acres (% <sup>1</sup> )) | SRMA<br>(Acres (% <sup>1</sup> )) |
|--|-----------------------------------|-----------------------------------|
| Arid Warm – Sandy Uplands, Loamy Uplands     | 122,800 (33)                      | 31,300 (8)                        |
| Arid Warm – Shallow                          | 57,800 (19)                       | 17,600 (6)                        |
| Arid Warm – Very Shallow                     | 33,200 (11)                       | 21,900 (8)                        |
| Semiarid Warm – Sandy Uplands, Loamy Uplands | 36,600 (19)                       | 1,600 (1)                         |
| Semiarid Warm – Shallow, Deep Rocky          | 27,400 (11)                       | 4,500 (2)                         |
| Semiarid Warm – Very Shallow                 | 10,300 (13)                       | 3,000 (4)                         |
| Outcrops                                     | 7,000 (11)                        | 6,100 (10)                        |
| Arid Warm – Breaks                           | 5,300 (8)                         | 4,000 (6)                         |
| Arid Warm – Sandy Bottoms                    | 2,600 (14)                        | 2,300 (13)                        |
| Semiarid Warm – Breaks                       | 3,100 (10)                        | 800 (3)                           |
| Arid Warm – Deep Rocky                       | 1,800 (4)                         | 1,700 (4)                         |
| Riparian                                     | 1,200 (35)                        | 800 (24)                          |
| Arid Warm – Saline Uplands                   | 800 (4)                           | 900 (4)                           |
| Arid Warm – Finer Uplands, Clay Uplands      | 500 (2)                           | 1,200 (5)                         |
| Arid Warm – Gypsum                           | 800 (17)                          | 700 (15)                          |
| Arid Warm – Saline Bottoms, Bottoms          | 200 (3)                           | 600 (10)                          |
| Semiarid Warm – Finer Uplands                | 200 (0)                           | 600 (1)                           |
| Semiarid Warm – Sandy Bottoms, Bottoms       | 300 (5)                           | 200 (4)                           |
| Arid Warm – Saline Hills                     | 100 (1)                           | 300 (3)                           |
| <b>Grand Total</b>                           | <b>312,000 (17)</b>               | <b>100,100 (5)</b>                |

Source: BLM GIS 2022

<sup>1</sup>Percentage of total ecological site group acreage in GSENM.

The number of acres of ecological site groups that would be in each type of ROW allocation under Alternative D is summarized in Table 3-24. The majority of each ecological site groups in the GSENM would be in ROW exclusion areas (Table 3-24). Compared with Alternative A, this would offer more protection to vegetation and special status species and reduce impacts associated with ROWs, as described under *Impacts Common to All Alternatives*.



**Table 3-24. Ecological Site Groups in Right-of-way Allocations under Alternative D**

| Ecological Site Groups  | Open to ROW Authorization (Acres (% <sup>1</sup> )) | ROW Avoidance Area (Acres (% <sup>1</sup> )) | ROW Exclusion Area (Acres (% <sup>1</sup> )) |
|---|---|--|--|
| Arid Warm – Sandy Uplands, Loamy Uplands                                    | 700 (<1)  | 32,600 (9)                                   | 338,800 (90)                                 |
| Arid Warm – Shallow   | 100 (<1)  | 13,300 (4)                                   | 291,300 (95)                                 |
| Arid Warm – Very Shallow  | 100 (<1)  | 13,100 (5)                                   | 275,900 (95)                                 |
| Semiarid Warm – Shallow, Deep Rocky   | 400 (<1)  | 54,500 (22)                                  | 194,300 (77)                                 |
| Semiarid Warm – Sandy Uplands, Loamy Uplands                                | 300 (<1)  | 87,200 (46)                                  | 94,900 (51)                                  |
| Semiarid Warm – Very Shallow  | 0 (0)   | 5,900 (8)                                    | 72,200 (92)                                  |
| Arid Warm – Breaks  | 0 (0)   | 400 (1)                                      | 69,700 (99)                                  |
| Outcrops  | 0 (0)   | 900 (1)                                      | 62,000 (99)                                  |
| Semiarid Warm – Finer Uplands   | 200 (<1)  | 17,100 (32)                                  | 34,200 (64)                                  |
| Arid Warm – Deep Rocky  | 0 (0)   | 1,400 (3)                                    | 45,600 (97)                                  |
| Semiarid Warm – Breaks  | 0 (0)   | 1,700 (5)                                    | 29,300 (95)                                  |
| Arid Warm – Finer Uplands, Clay Uplands                                     | 200 (1)   | 1,400 (5)                                    | 22,800 (87)                                  |
| Arid Warm – Saline Uplands  | 0 (0)   | 1,000 (5)                                    | 20,600 (94)                                  |
| Arid Warm – Sandy Bottoms   | 0 (0)   | 700 (4)                                      | 17,300 (96)                                  |
| Arid Warm – Saline Hills  | 0 (0)   | 400 (4)                                      | 10,900 (96)                                  |
| Arid Warm – Saline Bottoms, Bottoms   | 200 (3)   | 500 (8)                                      | 4,800 (80)                                   |
| Semiarid Warm – Sandy Bottoms, Bottoms                                      | 100 (2)   | 1,600 (29)                                   | 3,500 (64)                                   |
| Arid Warm – Gypsum  | 0 (0)   | 400 (9)                                      | 4,200 (91)                                   |
| Riparian  | 0 (0)   | 100 (3)                                      | 3,300 (97)                                   |
| Semiarid Cool – Shallow   | 0 (0)   | 0 (0)  | 3,000 (100)                                  |
| Semiarid Warm – Saline Hills  | 0 (0)   | 0 (0)  | 2,300 (96)                                   |
| Semiarid Cool – Deep Rocky  | 0 (0)   | 0 (0)  | 1,900 (95)                                   |
| Semiarid Warm – Saline Uplands  | 0 (0)   | 100 (6)                                      | 1,500 (88)                                   |
| Semiarid Warm – Saline Bottoms  | 0 (0)   | 200 (13)                                     | 1,400 (88)                                   |
| Semiarid Cool – Very Shallow  | 0 (0)   | 0 (0)  | 700 (100)                                    |
| Semiarid Cool – Breaks  | 0 (0)   | 0 (0)  | 600 (100)                                    |
| Semiarid Cool – Saline Uplands, Sandy Uplands, Loamy Uplands, Finer Uplands | 0 (0)   | 0 (0)  | 500 (100)                                    |
| Semiarid Warm – Clay Uplands  | 0 (0)   | 100 (33)                                     | 200 (67)                                     |
| Semiarid Warm – Gypsum  | 0 (0)   | 0 (0)  | 200 (100)                                    |
| <b>Total Acres</b>  | <b>2,300 (&lt;1)</b>                                | <b>234,600 (13)</b>                          | <b>1,607,900 (86)</b>                        |

Source: BLM GIS 2022

<sup>1</sup>Percentage of total ecological site group acreage in GSENM.**Alternative E**

Effects from vegetation management direction under Alternative E would be similar to those described under Alternative C. Under Alternative E, the BLM would use the best available information, which may include, but is not limited to, soil and biological soil crust resource conditions, various types of conditions mapping, and information on hydrologic conditions and trends, to design vegetation management. This would provide more flexibility for incorporating new information and emerging technologies into designing vegetation treatments compared with Alternative B, C, and D.

The number of acres of ecological site groups that would be unavailable within the GSENM boundary for livestock grazing under Alternative E is summarized in **Table 3-25**. Impacts from grazing on vegetation and special status plant species within GSENM under Alternative E would have the same substantial beneficial protections to vegetation as Alternatives B and C and substantially more than Alternative A.

**Table 3-25. Ecological Site Groups Unavailable for Livestock Grazing under Alternative E**

| Ecological Site Groups  | Unavailable for Livestock Grazing (Acres (% <sup>1</sup> )) |
|---|---|
| Arid Warm - Sandy Uplands, Loamy Uplands                                    | 32,200 (9)  |
| Arid Warm - Shallow   | 26,300 (9)  |
| Semiarid Warm - Shallow, Deep Rocky   | 20,100 (8)  |
| Arid Warm - Very Shallow  | 14,500 (5)  |
| Semiarid Warm - Very Shallow  | 8,400 (11)  |
| Arid Warm - Breaks  | 6,300 (9)   |
| Outcrops  | 5,300 (8)   |
| Semiarid Warm - Sandy Uplands, Loamy Uplands                                | 3,400 (2)   |
| Semiarid Warm - Breaks  | 2,700 (9)   |
| Semiarid Warm - Finer Uplands   | 1,700 (3)   |
| Riparian  | 1,600 (47)  |
| Arid Warm - Sandy Bottoms   | 1,600 (9)   |
| Arid Warm - Deep Rocky  | 1,400 (3)   |
| Semiarid Warm - Sandy Bottoms, Bottoms                                      | 600 (11)  |
| Arid Warm - Finer Uplands, Clay Uplands                                     | 400 (2)   |
| Arid Warm - Saline Bottoms, Bottoms   | 400 (7)   |
| Arid Warm - Gypsum  | 300 (7)   |
| Arid Warm - Saline Uplands  | 300 (1)   |
| Semiarid Cool - Deep Rocky  | 300 (15)  |
| Semiarid Cool - Shallow   | 100 (3)   |
| Semiarid Cool - Saline Uplands, Sandy Uplands, Loamy Uplands, Finer Uplands | 100 (20)  |
| Semiarid Warm - Saline Hills  | 100 (4)   |
| <b>Total Acres</b>  | <b>128,100 (7)</b>  |

Source: BLM GIS 2022

<sup>1</sup>Percentage of total ecological site group acreage in GSENM .

The number of acres of ecological site groups that would be designated as OHV closed and OHV limited to designated routes under Alternative E is summarized in **Table 3-26**. Approximately 1,245,400 acres and the majority (more than 50 percent) of most ecological site groups in GSENM would be closed to OHV travel (**Table 3-26**). These areas would provide enhanced protection to vegetation communities and special status species by reducing impacts from surface-disturbing activities, as described under *Impacts Common to All Alternatives*. Closing previously designated limited areas would reduce vehicular travel on designated routes by reducing areas that could be considered for route designation in future TMP planning. Such closure would, therefore, limit impacts on vegetation and special status species that lead to reduced resiliency to a greater extent than under Alternative A.

**Table 3-26. Ecological Site Groups in Travel Management Areas under Alternative E**

| Ecological Site Groups                       | Closed (Acres (% <sup>1</sup> )) | Limited (Acres (% <sup>1</sup> )) |
|--|----------------------------------|-----------------------------------|
| Arid Warm - Sandy Uplands, Loamy Uplands     | 244,100 (65)                     | 133,600 (35)                      |
| Arid Warm - Shallow                          | 231,600 (76)                     | 73,900 (24)                       |
| Arid Warm - Very Shallow                     | 235,800 (82)                     | 53,400 (18)                       |
| Semiarid Warm - Shallow, Deep Rocky          | 152,000 (60)                     | 100,100 (40)                      |
| Semiarid Warm - Sandy Uplands, Loamy Uplands | 49,500 (26)                      | 138,400 (74)                      |
| Semiarid Warm - Very Shallow                 | 55,700 (71)                      | 22,400 (29)                       |

| Ecological Site Groups   | Closed<br>(Acres (% <sup>1</sup> )) | Limited<br>(Acres (% <sup>1</sup> )) |
|--|-------------------------------------|--------------------------------------|
| Arid Warm - Breaks   | 67,900 (97)                         | 2,200 (3)                            |
| Outcrops   | 55,100 (88)                         | 7,800 (12)                           |
| Semiarid Warm - Finer Uplands  | 19,800 (37)                         | 33,600 (63)                          |
| Arid Warm - Deep Rocky   | 36,600 (78)                         | 10,500 (22)                          |
| Semiarid Warm - Breaks   | 26,900 (87)                         | 4,100 (13)                           |
| Arid Warm - Finer Uplands, Clay Uplands  | 10,100 (39)                         | 16,000 (61)                          |
| Arid Warm - Saline Uplands   | 17,100 (78)                         | 4,600 (21)                           |
| Arid Warm - Sandy Bottoms  | 13,700 (76)                         | 4,400 (24)                           |
| Arid Warm - Saline Hills   | 9,600 (85)                          | 1,700 (15)                           |
| Arid Warm - Saline Bottoms, Bottoms  | 2,600 (43)                          | 3,400 (57)                           |
| Semiarid Warm - Sandy Bottoms, Bottoms   | 2,500 (45)                          | 2,900 (53)                           |
| Arid Warm - Gypsum   | 3,400 (74)                          | 1,200 (26)                           |
| Riparian   | 3,100 (91)                          | 300 (9)                              |
| Semiarid Cool - Shallow  | 2,400 (80)                          | 600 (20)                             |
| Semiarid Warm - Saline Hills   | 1,100 (46)                          | 1,300 (54)                           |
| Semiarid Cool - Deep Rocky   | 1,400 (70)                          | 500 (25)                             |
| Semiarid Warm - Saline Uplands   | 500 (29)                            | 1,200 (71)                           |
| Semiarid Warm - Saline Bottoms   | 1,000 (63)                          | 600 (38)                             |
| Semiarid Cool - Very Shallow   | 700 (100)                           | 0 (0)                                |
| Semiarid Cool - Breaks   | 500 (83)                            | 100 (17)                             |
| Semiarid Cool - Saline Uplands, Sandy Uplands,<br>Loamy Uplands, Finer Uplands | 400 (80)                            | 100 (20)                             |
| Semiarid Warm - Clay Uplands   | 200 (67)                            | 100 (33)                             |
| Semiarid Warm - Gypsum   | 100 (50)                            | 100 (50)                             |
| <b>Grand Total</b>   | <b>1,245,400 (67)</b>               | <b>619,100 (33)</b>                  |

Source: BLM GIS 2022

<sup>1</sup>Percentage of total ecological site group acreage in GSENM.

Under Alternative E, the BLM would manage the same 486,400 acres of vegetation as ERMA and 417,7100 acres as SRMA as under Alternative C (Table 3-19). With fewer acres managed as RMA, there would be fewer restrictions on recreation and higher potential that greater group sizes, fewer restrictions on camping and campfires, and the development of facilities could lead to an increase in the degradation of vegetation communities, compared with Alternative A. Alternatively, having fewer acres managed as RMA could lead to more dispersed recreation patterns, which could lead to less intense impacts to vegetation in those places where impacts do occur. In general, management for the front and passage areas would be less limiting while the outback and primitive areas would have more restrictions. These restrictions in the outback and primitive areas would reduce impacts that recreational activities would have on vegetation and special status species.

The number of acres of ecological site groups that would be in each type of ROW allocation under Alternative E is summarized in Table 3-27. The majority of most ecological site groups in GSENM would be in ROW exclusion areas (Table 3-27). Compared with Alternative A, this would offer more protection to vegetation and special status species and reduce impacts associated with ROWs, as described under *Impacts Common to All Alternatives*.

**Table 3-27. Ecological Site Groups in ROW Allocations under Alternative E**

| Ecological Site Groups  | Open to ROW Authorization (Acres (% <sup>1</sup> )) | ROW Avoidance Area (Acres (% <sup>1</sup> )) | ROW Exclusion Area (Acres (% <sup>1</sup> )) |
|---|---|--|--|
| Arid Warm – Sandy Uplands, Loamy Uplands                                    | 1,700 (0)   | 124,800 (33)                                 | 245,500 (65)                                 |
| Arid Warm – Shallow   | 600 (0)   | 71,000 (23)                                  | 233,100 (76)                                 |
| Arid Warm – Very Shallow  | 2,200 (1)   | 49,800 (17)                                  | 237,100 (82)                                 |
| Semiarid Warm – Shallow, Deep Rocky   | 3,400 (1)   | 93,700 (37)                                  | 152,100 (60)                                 |
| Semiarid Warm – Sandy Uplands, Loamy Uplands                                | 1,600 (1)   | 131,200 (70)                                 | 49,600 (26)                                  |
| Semiarid Warm – Very Shallow  | 100 (0)   | 22,300 (29)                                  | 55,700 (71)                                  |
| Arid Warm – Breaks  | 100 (0)   | 1,800 (3)                                    | 68,300 (97)                                  |
| Outcrops  | 0 (0)   | 7,700 (12)                                   | 55,100 (88)                                  |
| Semiarid Warm – Finer Uplands   | 500 (1)   | 31,100 (58)                                  | 19,800 (37)                                  |
| Arid Warm – Deep Rocky  | 100 (0)   | 9,600 (20)                                   | 37,300 (79)                                  |
| Semiarid Warm – Breaks  | 0 (0)   | 4,100 (13)                                   | 26,900 (87)                                  |
| Arid Warm – Finer Uplands, Clay Uplands                                     | 200 (1)   | 14,000 (54)                                  | 10,300 (39)                                  |
| Arid Warm – Saline Uplands  | 0 (0)   | 4,400 (20)                                   | 17,200 (79)                                  |
| Arid Warm – Sandy Bottoms   | 100 (1)   | 4,200 (23)                                   | 13,800 (76)                                  |
| Arid Warm – Saline Hills  | 0 (0)   | 1,700 (15)                                   | 9,600 (85)                                   |
| Arid Warm – Saline Bottoms, Bottoms   | 200 (3)   | 2,700 (45)                                   | 2,600 (43)                                   |
| Semiarid Warm – Sandy Bottoms, Bottoms                                      | 100 (2)   | 2,500 (45)                                   | 2,500 (45)                                   |
| Arid Warm – Gypsum  | 0 (0)   | 1,200 (26)                                   | 3,400 (74)                                   |
| Riparian  | 0 (0)   | 300 (9)                                      | 3,100 (91)                                   |
| Semiarid Cool – Shallow   | 0 (0)   | 600 (20)                                     | 2,400 (80)                                   |
| Semiarid Warm – Saline Hills  | 0 (0)   | 1,300 (54)                                   | 1,100 (46)                                   |
| Semiarid Cool – Deep Rocky  | 0 (0)   | 500 (25)                                     | 1,400 (70)                                   |
| Semiarid Warm – Saline Uplands  | 0 (0)   | 1,200 (71)                                   | 500 (29)                                     |
| Semiarid Warm – Saline Bottoms  | 0 (0)   | 600 (38)                                     | 1,000 (63)                                   |
| Semiarid Cool – Very Shallow  | 0 (0)   | 0 (0)  | 700 (100)                                    |
| Semiarid Cool – Breaks  | 0 (0)   | 100 (17)                                     | 500 (83)                                     |
| Semiarid Cool – Saline Uplands, Sandy Uplands, Loamy Uplands, Finer Uplands | 0 (0)   | 100 (20)                                     | 400 (80)                                     |
| Semiarid Warm – Clay Uplands  | 0 (0)   | 100 (33)                                     | 200 (67)                                     |
| Semiarid Warm – Gypsum  | 0 (0)   | 100 (50)                                     | 100 (50)                                     |
| <b>Total Acres</b>  | <b>10,900 (1)</b>                                   | <b>582,700 (31)</b>                          | <b>1,251,300 (67)</b>                        |

Source: BLM GIS 2022

<sup>1</sup>Percentage of total ecological site group acreage in GSENM.**Cumulative Impacts**

The BLM, Forest Service, NPS, and state, tribal, county, and privately owned land adjacent to GSENM are considered the cumulative effects analysis area for vegetation. Ongoing and planned actions in and near GSENM would influence vegetation conditions and management effectiveness on a regional scale. The timeframe for cumulative environmental consequences for future actions is 20 years, or the life of the RMP.

Portions of GSENM adjoin other BLM-managed lands, National Forest System lands, national parks, and national recreation areas, each with its own land management plan guiding vegetation and fuels management in the administrative area. Vegetation management, including fire and fuels management, is becoming more broadly consistent across federal land ownerships due to updated plan adherence with current federal law, regulation, and policy. Direction for vegetation management in the adjacent agency

land management plans are complementary to the proposed plan components for GSENM. This means broad movement toward desired conditions for vegetation condition would be facilitated across administrative boundaries in this region.

The cumulative impacts of past and present actions on vegetation in the planning area are captured in the description of the affected environment (see **Section 3.3**, *Vegetation, Affected Environment*). Primarily, this includes frequent pre-European settlement lower-intensity fire, followed by post-European settlement livestock grazing and fire suppression, including policies established in the early 1900s and carried forward in other forest and land management plans and other state and local policies throughout the broader landscape, which have resulted in current vegetation conditions that are departed from historical conditions. This has resulted in a landscape with increased pinyon-juniper densities and invasive annual grasses and a greater potential for uncharacteristically large, severe fires compared with historical conditions. Ongoing climate trends, including more frequent extreme fire weather, combine with and exacerbate these conditions.

The importance of vegetation management, including fuels treatments, wildland fire management, and managing for wildlife habitat, is widely recognized by state and federal agencies, adjacent landowners, and the general public. Actions taken outside GSENM include federal and state-funded hazardous fuels reduction projects on Forest Service and BLM-managed lands, which generally aim to move vegetation conditions and fuels loading toward historical conditions and restore historical fire regime groups. The KFO Noxious and Invasive Vegetation Management Environmental Assessment would continue to guide weed management on lands bordering GSENM and would, therefore, have the potential to reduce weeds coming onto GSENM. Other vegetation management projects in the cumulative effects analysis area include the Upper Kanab Creek Watershed Environmental Assessment. There are also additional renewable energy and other ROW projects in the cumulative effects analysis area, including industrial-scale solar energy development on [Utah Trust Lands Administration \(formerly State of Utah School and Institutional Trust Lands Administration\)](#) lands near Big Water. [Other relevant activities include recreational activities, such as camping/campfire use or OHV use, which increase the potential for human-caused fires that can burn into GSENM, and continued livestock grazing that could affect the condition of vegetation within the cumulative effects analysis area.](#)

Also, nonfederal land management policies are likely to continue affecting vegetation management around GSENM. The cumulative effects across the large, geographically complex, and diverse cumulative analysis area are difficult to analyze, considering the uncertainties associated with government and private actions, and ongoing changes to the region's economy. However, based on the trends identified in this section, cumulative effects, including increases in recreation, continued establishment and spread of weeds, continued encroachment of pinyon and juniper into sagebrush communities, ongoing livestock grazing, and continued housing and commercial development, are likely to continue or increase.

Reasonably foreseeable future actions in GSENM have the potential to impact vegetation; these are generally projects that would substantially alter fuel loading or projects for which there is a risk of human-caused fire. Projects that are anticipated to alter vegetation conditions include the Skutumpah Terrace Greater Sage-grouse Habitat Restoration Projects, and post-fire restoration projects. Projects that may increase the potential for impacts on vegetation, including removal and increased invasive weed spread, are ROW development projects, including the [Garkane ROWs \(Cottonwood/Cockscomb; Buckskin to](#)

Kanab, Utah and Fredonia; Buckskin to Page), the Arcadin ROW, the Navajo-McCullough Powerline ROW, and Lake Powell Pipeline ROW.

Proposed vegetation management activities under the alternatives would contribute to the cumulative effects of regional vegetation management by other agencies and stakeholders. These efforts would contribute to landscape restoration and ecological resilience on a larger scale, with a focus on achieving a resistant, resilient mosaic of desired vegetation communities with diversity of species, canopy, density, and age class in line with ecological site potentials. These efforts would also focus on restoring more natural fire regimes, and reducing the potential for uncharacteristically large and severe fires. The alternatives that provide for a full range of treatment options, including active vegetation and fuels management, could have greater contributions toward these effects than Alternative D, which emphasizes passive management and more limited treatment options.

### 3.4 WATER RESOURCES

#### 3.4.1 Affected Environment

This section summarizes the surface water and groundwater resources within the planning area, as well as water rights and water quantity analysis. Additional context concerning water resources is provided in Appendix I.4.

#### Surface Water Sources

Although water shaped much of the terrain of the planning area, there are limited sources of surface water under present-day conditions. Surface water in this region flows to the Colorado River (above or below Glen Canyon Dam). The planning area crosses five level 4 (HUC 8) subbasins and 25 level 5 (HUC 10) watersheds<sup>10</sup> (Figure 3-22 in Appendix A). The HUC 8 subbasins and acreages within the planning area include the Kanab Creek Subbasin (HUC 1501003; 111,600 acres), the Paria River Subbasin (HUC 14070007; 492,300 acres), the Lower Lake Powell Subbasin (HUC 14070006; 593,100 acres), the Escalante River Subbasin (HUC 14070005; 664,500 acres), and the Upper Lake Powell Subbasin (HUC 14070001; 4,000 acres). The HUC 10 watersheds and associated acreages are listed in Table 3-28.

**Table 3-28. GSENM Hydrologic Unit Code 10 Watersheds**

| Watershed Name                | HUC 10 Code | HUC 8 Subbasin  | Acres within the Decision Area | Total Acres of the Watershed | Percentage of Watershed in the Decision Area |
|-------------------------------|-------------|-----------------|--------------------------------|------------------------------|--|
| Headwaters Escalante River    | 1407000501  | Escalante River | 12,300                         | 204,100                      | 6  |
| Boulder Creek-Escalante River | 1407000502  | Escalante River | 93,600                         | 233,700                      | 40   |
| Harris Wash                   | 1407000503  | Escalante River | 131,700                        | 166,000                      | 79   |

<sup>10</sup> A hydrologic unit is an area delineated to nest in a multi-level, hierarchical system based off the hydraulic gradient of the area. Its boundaries are defined by hydrographic and topographic criteria that delineate an area of land upstream from a specific point on a river, stream, or similar surface waters. HUC is the acronym for hydrologic unit code. Every hydrologic unit is identified by a unique HUC consisting of 2 to 12 digits based on the levels of classification in the hydrologic unit system. HUC 8, or subbasins, are analogous to a level 4 watershed, and HUC 10, or watershed, are analogous to a level 5 watershed.

3. Affected Environment and Environmental Consequences (Water Resources)

| Watershed Name                        | HUC 10 Code | HUC 8 Subbasin    | Acres within the Decision Area | Total Acres of the Watershed | Percentage of Watershed in the Decision Area |
|---------------------------------------|-------------|-------------------|--------------------------------|------------------------------|--|
| Horse Canyon-Escalante River          | 1407000504  | Escalante River   | 163,000                        | 194,300                      | 84   |
| Twentymile Wash /Twentyfive Mile Wash | 1407000505  | Escalante River   | 132,200                        | 139,300                      | 95   |
| Moody Creek-Escalante River           | 1407000506  | Escalante River   | 30,200                         | 163,800                      | 18   |
| Fortymile Gulch-Escalante River       | 1407000507  | Escalante River   | 103,000                        | 194,600                      | 53   |
| Kanab Creek Headwaters                | 1501000301  | Kanab Creek       | 2,200                          | 124,200                      | 2  |
| White Sage Wash                       | 1501000302  | Kanab Creek       | 24,800                         | 137,000                      | 18   |
| Upper Johnson Wash                    | 1501000303  | Kanab Creek       | 86,600                         | 183,800                      | 47   |
| Aztec Creek-Lake Powell               | 1407000601  | Lower Lake Powell | 31,700                         | 235,300                      | 13   |
| Croton Canyon                         | 1407000602  | Lower Lake Powell | 121,800                        | 130,400                      | 93   |
| Last Chance Creek                     | 1407000603  | Lower Lake Powell | 141,600                        | 175,800                      | 81   |
| Warm Creek                            | 1407000605  | Lower Lake Powell | 97,800                         | 132,900                      | 74   |
| Upper Wahweap Creek                   | 1407000608  | Lower Lake Powell | 135,800                        | 137,400                      | 99   |
| Lower Wahweap Creek                   | 1407000609  | Lower Lake Powell | 62,400                         | 152,600                      | 41   |
| West Canyon Creek-Lake Powell         | 1407000610  | Lower Lake Powell | 2,000                          | 140,900                      | 1  |
| Upper Paria River                     | 1407000701  | Paria River       | 92,800                         | 169,300                      | 55   |
| Sheep Creek                           | 1407000702  | Paria River       | 42,900                         | 63,100                       | 68   |
| Hackberry Canyon-Cottonwood Creek     | 1407000703  | Paria River       | 69,300                         | 69,300                       | 100  |
| Upper Buckskin Gulch                  | 1407000704  | Paria River       | 159,400                        | 189,900                      | 84   |
| Lower Buckskin Gulch                  | 1407000705  | Paria River       | 6,300                          | 122,100                      | 5  |
| Middle Paria River                    | 1407000706  | Paria River       | 132,700                        | 143,900                      | 92   |
| Halls Creek                           | 1407000112  | Upper Lake Powell | 4,000                          | 113,200                      | 4  |
| Sandy Creek-Fremont River             | 1407000304  | Fremont*          | 200                            | 245,200                      | <1   |

Source: BLM GIS 2022

\*Sandy Creek – Fremont River HUC 10 crosses into the planning area for less than 1 percent of the total HUC 10 acreage. The subbasin for this watershed is the Fremont HUC 8 Subbasin. However, because the acreage within the planning area is so minimal, the Fremont HUC 8 Subbasin is not discussed in detail in this analysis.

*Aquatic Assessment, Inventory, and Monitoring*

To assess, inventory, and monitor aquatic systems, the BLM has implemented a National Aquatic Monitoring Framework as part of the BLM’s AIM strategy (BLM 2021). This framework provides quantitative data and tools to guide and justify policy action, land uses, and adaptive management decisions. From 2013 through 2023, 68 Lotic AIM sample events have taken place at 47 distinct reaches in and adjacent to GSENM; some sites were sampled multiple times.

BLM selected a subset of indicators that addressed conditions of stream habitat or water quality ) in relation to established benchmark values (see **Appendix B**).Data from lotic AIM reaches, riparian and wetland AIM plots, and terrestrial AIM points were evaluated across GSENM (see **Appendix B and Table 3-29**). Indicators were evaluated in relation to benchmarks to determine ecological condition and identify areas by watershed with ecological concerns (See Appendix B for details). Watersheds containing reaches with high departure from the reference condition (Boulder Creek-Escalante River (Bear Creek-Boulder Creek and Lower Deer Creek HUC 12s), Hackberry Canyon-Cottonwood Creek, Horse Canyon-Escalante River, Last Chance Creek, Middle Paria River, Upper Buckskin Gulch, Upper Johnson Wash, and Upper Paria River) were identified (see **Appendix B, Figure 21**).

**Table 3-29. Lotic AIM Indicators Evaluated**

| Habitat Indicators               | Water Quality Indicators            |
|----------------------------------|-------------------------------------|
| Percent Overhead Cover           | Macroinvertebrate Observed/Expected |
| Percent Fine Sediment            | pH                                  |
| Percent Banks Covered and Stable | Total Nitrogen and Total Phosphorus |
| Floodplain Connectivity          | Specific Conductance                |
| -                                | Temperature                         |

Source: BLM 2023

*Water Quality*

Every other year, the UDWQ compiles all readily available data and conducts analyses to determine whether the water quality is sufficient to meet the beneficial uses assigned to waters in Utah (UDEQ 2013). Forty-one assessment units that cross into the planning area are protected for the following beneficial uses:

- 1C – Domestic/drinking water source
- 2A – Frequent primary contact recreation (for example, swimming)
- 2B – Infrequent primary contact recreation (for example, wading and fishing)
- 3A – Cold-water fishery/aquatic life
- 3B – Warm-water fishery/aquatic life
- 3C – Nongame fishery/aquatic life
- 4 – Agriculture (crop irrigation and stock watering)

For the 2022 reporting year, 17 of these assessment units were classified as impaired and failing to meet water quality standards. **Table 3-30** identifies the impaired assessment units and their causes of impairment. **Figure 3-20** in **Appendix A** shows riparian areas and the impaired assessment units. Additionally, 20 assessment units had insufficient data to be assessed, 2 supported all designated uses, and 2 supported all designated or assessed uses.



**Table 3-30. Utah List of Assessment Units in the Planning Area for Reporting Year 2022**

| <b>Waterbody Name</b> | <b>Assessment Unit ID</b> | <b>Total Acres</b> | <b>Acres in Planning Area</b> | <b>Assessment Category</b>                   | <b>Beneficial Use</b> | <b>Cause of Impairment</b>  |
|-----------------------|---------------------------|--------------------|-------------------------------|--|-----------------------|---|
| Birch Creek           | UT14070005-002_00         | 55,926             | 13                            | 5 – total maximum daily load (TMDL) required | 2B, 3A, 4             | 3A: Temperature   |
| Calf Creek            | UT14070005-007_00         | 34,682,406         | 8,600                         | 5 – TMDL required                            | 2B, 3A, 4             | 3A: Temperature   |
| Cottonwood Creek      | UT14070007-004_00         | 275,440,635        | 68,100                        | 5 – TMDL required                            | 2B, 3C, 4             | 3C: Dissolved Oxygen  |
| Escalante River Lower | UT14070005-011_00         | 5,956,733          | 1,500                         | 5 – TMDL required                            | 2B, 3B, 4             | 3B: Dissolved Oxygen  |
| Escalante River Upper | UT14070005-012_00         | 8,006,322          | 2,000                         | 5 – TMDL required                            | 2B, 3B, 4             | 3B: Benthic Invertebrate Assessment<br>4: TDS   |
| Halls Creek           | UT14070001-001_00         | 16,182,685         | 4,000                         | 5 – TMDL required                            | 2B, 3B, 4             | 3B: Temperature   |
| Johnson Wash-1        | UT15010003-004_00         | 392,904,908        | 97,100                        | 5 – TMDL required                            | 2B, 3C, 4             | 4: TDS and Boron  |
| Johnson Wash-2        | UT15010003-005_00         | 50,014,130         | 12,400                        | 5 – TMDL required                            | 2B, 3A, 4             | 2B: pH<br>3A: pH, Temperature, Benthic Invertebrate Assessment, Zinc, and Dissolved Oxygen<br>4: pH and TDS |
| Kanab Creek-1-2       | UT15010003-002_02         | 5,842,760          | 1,400                         | 5 – TMDL required                            | 2B, 3C, 4             | 4: TDS  |
| Kanab Creek-2         | UT15010003-003_00         | 2,877,497          | 700                           | 5 – TMDL required                            | 2B, 3C, 4             | 3C: Selenium<br>4: Selenium, TDS, and Boron   |
| Last Chance Creek     | UT14070006-004_00         | 571,852,903        | 141,300                       | 5 – TMDL required                            | 2B, 3B, 4             | 3B: Benthic invertebrate assessment and dissolved oxygen<br>4: TDS  |
| Oak Creek             | UT14070003-011_00         | 703,688            | 200                           | 5 – TMDL required                            | 1C, 2A, 3A, 4         | 3A: Temperature   |
| Paria River-1         | UT14070007-001_00         | 358,875,668        | 88,700                        | 5 – TMDL required                            | 2B, 3C, 4             | 3C: Temperature and benthic invertebrate assessment<br>4: TDS   |
| Paria River-2         | UT14070007-002_00         | 459,072,591        | 113,400                       | 5 – TMDL required                            | 2B, 3C, 4             | 3C: Temperature<br>4: TDS   |

| Waterbody Name | Assessment Unit ID | Total Acres | Acres in Planning Area | Assessment Category | Beneficial Use | Cause of Impairment                           |
|----------------|--------------------|-------------|------------------------|---------------------|----------------|---|
| Paria River-3  | UT14070007-005_00  | 242,665,997 | 60,000                 | 5 – TMDL required   | 2B, 3C, 4      | 3C: Benthic invertebrate assessment<br>4: TDS |
| The Gulch      | UT14070005-010_00  | 156,870,034 | 38,800                 | 5 – TMDL required   | 2B, 3B, 4      | 3B: Benthic invertebrate assessment           |
| Wahweap Creek  | UT14070006-001_00  | 787,047,677 | 194,500                | 5 – TMDL required   | 2B, 3B, 4      | 3B:<br>Temperature<br>4: TDS                  |

Source: UDWQ 2022

Note: Although there are impaired waters identified in the watersheds that cross into the planning area, the BLM is only responsible for management of units within the decision area boundary.

### Groundwater Sources

The Colorado Plateau aquifers underlie the decision area (Robson and Banta 1995). The Colorado Plateau aquifers underlie an area of approximately 110,000 square miles in western Colorado, northwestern New Mexico, northeastern Arizona, and eastern Utah. In general, the aquifers in the Colorado Plateau area are composed of permeable, moderate- to well-consolidated sedimentary rocks. Much of the land in this sparsely populated region is underlain by rocks that contain aquifers capable of yielding usable quantities of water of a quality suitable for most agricultural and domestic uses. The groundwater quantity and quality in the Colorado Plateau aquifers are extremely variable.

### Water Rights

There are 2,039 total rights within the planning area and 1,379 BLM-managed water rights in the decision area. The vast majority of BLM-managed water rights are point-to-point stock watering rights. There have been no active new uses or large applications in the past 10 years. Water use in the decision area is mostly for agriculture, but there is also some domestic and industrial use to support fire suppression, domestic wells, and oil and gas wells. Five drinking water protection zones and two culinary water service areas are within the decision area (**Figure 3-21** in **Appendix A**).

### 3.4.2 Environmental Consequences

Refer to **Section F.9**, Water Resources, in **Appendix F**, Analytical Framework, for descriptions of the indicators, analysis areas, and assumptions used for the following analysis.

#### Issues

- How would management decisions of activities that disturb soils and accelerate erosion affect water resources (groundwater, surface water, wetlands, riparian areas, floodplains, and water quality)?
- How would proposed management impact water quality (and water quality standards set by the State of Utah and the U.S. Environmental Protection Agency) and protection of dependent resources?

### **Impacts Common to All Alternatives**

#### *Impacts from Surface-Disturbing Activities*

Decreased vegetation cover and soil compaction would reduce water infiltration, leading to an increase in surface water runoff, soil erosion, and sedimentation of adjacent waterways (Pouyat et al. 2020). Surface-disturbing activities can change the physical characteristics of streams, floodplains, and other surface waterbodies through direct disturbance of stream channels or by increasing runoff from the surrounding watershed. These changes contribute to stream bank erosion, increased turbidity, and degradation of water quality, potentially leading to new surface water impairments or inhibiting resolution of existing impairments.

Although decreased vegetation cover has the potential to contribute to increased sediment loading, research completed in eastern Oregon found that removal of western junipers increased late-season stream flows by 225 percent (Deboodt et al. 2008). The extent of sediment loading and runoff from woodland harvesting and vegetation treatments would depend on the method and size of harvest/treatment. Manual and chemical treatments would have minimal surface-disturbing impacts, and, therefore, would not contribute to potential runoff and sediment loading. Surface disturbance from mechanical treatments that exposes bare ground would contribute the most to potential runoff and sediment loading; however, these impacts may be reduced if vegetation residue is left on the ground. This residue would act as an interceptor for water infiltration and would reduce soil erosion (Cline et al. 2010).

Under all alternatives, measures would be required to stabilize soils and minimize surface water runoff for actions on slopes greater than 10 percent and to prohibit or avoid soil-disturbing discretionary actions on slopes greater than 30 percent. Surface-disturbing activities result in disruption or damage of biological soil crusts and create opportunities for the establishment and spread of noxious weeds that provide less vegetation cover than native species (Scott et al. 2017).

Increased recreation, travel, and access can degrade water resources through surface-disturbing activities, such as clearing soil and vegetation for roads, development, and other travel or recreational infrastructure. Surface disturbances could also occur from construction of recreational facilities, increased OHV travel, and excessive dispersed camping. Travel across the land, including OHV travel, mountain biking, hiking, and horseback riding, results in vegetation loss and soil compaction (Pouyat et al. 2020). The loss of vegetation and soil compaction can lead to soil erosion and increase sediment flow into waterways. Motorized vehicle traffic increases the likelihood of chemical spills, such as oil, grease, and antifreeze, which could contaminate surface waters through runoff (Nixon and Saphores 2007). Improper OHV use may degrade existing and future erosion-control features, stock tanks, and other management efforts implemented to protect water resources. This could not only increase erosion, vegetation loss, and soil compaction but also alter channelized and overland flow patterns and function.

Dispersed and developed recreation types result in minor amounts of vegetation loss, soil compaction, and soil erosion; these could directly and indirectly impact water resources by increasing sediment load and the potential for chemical contamination. Management approaches that direct recreation to specific areas and avoid dispersed recreation could result in more concentrated, but more predictable, localized and manageable impacts.

Any land acquired by the BLM over the life of the RMP would be managed similarly to the existing OHV area designations of adjoining BLM-managed lands or as stated—or implied—in the acquisition. Where

clarification is absent, the BLM would manage acquired lands as OHV limited to designated routes. The type of limitation would be set by implementation-level decisions; until these decisions are made, use may continue in the same manner and degree consistent with the purposes for which the acquisition was made.

Additionally, under Proclamation 10286, “All federal lands and interests in lands within the boundaries of the GSENM are...withdrawn from all forms of entry, location, selection, sale, or other disposition under the public land laws, from location, entry, and patent under the mining laws, and from disposition under all laws relating to mineral and geothermal leasing, other than by exchange that furthers the protective purposes of the GSENM.” As a result, there would be reduced pressure on water resources from mineral-related disturbance activities.

ROW exclusion and avoidance areas limit the amount of human-made runoff of soils into waterways within those areas and are generally considered to be protective of water quality. ROW exclusion and avoidance areas also reduce the likelihood of chemical spills onto the ground, which can then sink into the earth and contaminate groundwater. Potential infrastructure developments in ROW open areas would increase surface disturbance and the associated impacts on water resources, as described above.

#### *Impacts from Livestock Grazing*

Livestock grazing in riparian areas would continue to contribute to reduced water quality in the decision area. This would happen primarily from grazing causing soil erosion, compaction, and runoff into surface waters, reductions in bank stability and riparian canopy cover, and direct inputs of animal waste and nutrients into surface waters. As discussed in the *Affected Environment*, livestock grazing has been determined to contribute to water quality impairments in the planning area, and management actions have been underway to reduce the effects of grazing on water quality.

#### *Impacts from Climate Change*

The primary effects on water resources from increasing temperatures include reduced streamflow; increased water salinity, sedimentation, and water temperature; increased droughts and decreased water availability; and reduced riparian, floodplain, and wetland ecosystems. Riparian and wetland areas are likely to decrease in quality and quantity due to increasing temperatures, decreasing precipitation, and decreased groundwater availability. Ongoing climate trends combine with and exacerbate these conditions.

Additionally, as discussed in **Section 3.13**, Fire and Fuels Management, the BLM anticipates the decision area will experience an increase in fire risk and fire severity associated with warming temperatures from climate trends. Increased wildfires could cause increased sediment and decreased vegetation cover in areas where wildfires occur. See **Section 3.13**, Fire and Fuels Management, for more information on the impacts from climate change related to fire and fuels.

#### **Alternative A**

Under Alternative A, the BLM would manage water resources to protect and maintain water and natural flows, including water flowing into GSENM from adjacent lands. The BLM would exercise its existing land management authorities to protect and maintain available water and natural flows into and out of GSENM and allow the development of visitor centers and facilities in nearby communities. The addition of visitor centers and facilities in nearby communities could impact groundwater availability in GSENM, as well as surrounding water resources. These developments could also impact runoff and infiltration due to impacts of soil-disturbing activities.

Additionally, under Alternative A, management direction would allow water sources to be developed for beneficial recreation- and visitor-related uses in high-use remote areas, such as trailheads and recreational facilities. Management also would allow new water developments and maintenance of existing water developments to improve livestock and wildlife distribution. Under Alternative A, new water developments would be prohibited in relict plant communities and hanging gardens; however, maintenance activities would be allowed if these resources are not affected.

Impacts from water developments would be evaluated on a case-by-case basis. If additional water developments occur throughout GSENM, and precipitation declines because of warming temperatures, there is potential for decreased aquifer functionality. Decreased groundwater levels and availability could affect springs and surface water availability across the decision area. Springs in GSENM provide ecosystem functions and determine much of the natural water flow through GSENM. Studies in the decision area have shown anthropogenic impacts on springs across the decision area, including changes to geomorphology, water quality, landform stability, soil integrity, runout channel configuration, and vegetation composition (Spring Stewardship Institute 2021). Additionally, because the underlying aquifer, Glen Canyon Aquifer contains recharge areas and is partly recharged by precipitation, water availability could also be affected by climate change.

Under Alternative A, discretionary actions in drinking water source-protection zones and culinary water sources would be avoided. The BLM would develop strategies to mitigate any existing BLM-authorized activities that pose a threat to public water systems. Where surface-disturbing activities do not degrade water resources and are consistent with protection of GSENM objects, the BLM would allow surface-disturbing activities within drinking water source-protection zones. In these areas, management would identify permanent facilities locations to best eliminate potential contamination or pollution sources, and design facilities to prevent contaminated discharges to groundwater. Although facilities could be designed to prevent contaminated discharge to groundwater, there is still a potential threat to the groundwater sources dependent on site-specific facility operations and BMPs. These specifics should be evaluated on a project level to determine potential impacts on groundwater protection zones. Risk to groundwater protection zones is related to the connectivity of surface water, proximity, and the depth to groundwater. Groundwater levels vary across the decision area and, therefore, areas where groundwater is closer to the surface are more at risk for contamination based on surface activities.

Under Alternative A, the BLM would continue to manage soil resources as they were designated under the GSENM RMPs (BLM 2020a) and KEPA RMP (BLM 2020b). The 2020 GSENM RMPs and KEPA RMP requires measures to stabilize soils and minimize surface water runoff for slopes greater than 10 percent both during project activities and following project completion. Impacts on water resources associated with soil degradation include greater surface runoff and decreased water quality.

Additionally, **Section 3.2**, Soil Resources, and **Figure 3-5 (Appendix A)** discusses and displays site degradation susceptibility in relation to soil stability. See **Section 3.2** for more information on soils.

Under Alternative A, the BLM would continue to manage livestock resources as they were designated under the GSENM RMPs (BLM 2020a) and KEPA RMP (BLM 2020b). Existing management under Alternative A requires adaptively managing the season of use, duration, and distribution of livestock grazing to meet or move toward meeting BLM Utah Rangeland Health Standards. Actions taken toward improving land health include monitoring; maintaining existing developments; installing new developments, such as water developments; and implementing nonstructural range improvements, such as controlling for or

eradicating invasive species. Water gaps of up to one-eighth of a mile would be allowed to provide river access to cattle, while protecting the resources in the area for the following areas: Big Bowns Bench River Pasture, and Deer Creek Allotment River Pasture. Additionally, under Alternative A, livestock management would follow the BLM's current drought policy (BLM 2013).

Under Alternative A, 2,117,300 acres would be available for livestock grazing in watersheds within BLM-managed grazing allotments in GSENM and Glen Canyon (see **Table 3-31**). Impacts on water resources from livestock use are highly variable and depend on both site characteristics and grazing practices. In general, grazing can cause water quality impacts, such as stream bacteria loading from animal manure, including *Cryptosporidium parvum*, *Shigella* sp., and virulent strains of *Escherichia coli* (Hudson 2021). Intensive livestock grazing is also associated with ecological degradation of springs by groundwater extraction and overuse. These impacts include degraded groundwater quality, reduced discharge, soil compaction, and introduction of invasive plant and animal species (Spring Stewardship Institute 2021).

Construction of range improvement features, such as water developments, can result in localized surface disturbance as a result of vegetation removal. However, these features, if installed strategically, can improve livestock distribution across the environment and minimize concentrated surface disturbance. Improper livestock grazing near waterways can impact water quality by increasing *Escherichia coli* concentrations in waterbodies; this can be a health concern because some water sources are used for drinking water in backcountry sites.

Under Alternative A, the BLM would continue to manage resources as they were designated under the GSENM RMPs (BLM 2020a) and the KEPA RMP (BLM 2020b). OHV use on routes would be as identified in the 2000 MMP, unless otherwise specifically addressed in the 2020 Final EIS. Mechanized travel and equipment would be limited to routes designated specifically for such use and routes where OHV use is allowed. The development of trails for public safety would be allowed for the protection of resources or to provide opportunities for visitors. Specific route designation is an implementation-level decision that the BLM will address in a separate NEPA process.

Under Alternative A, 1,500 acres within GSENM's watersheds would continue to be closed to OHV travel, and 1,864,000 acres would continue limiting OHV travel to designated routes. 100 acres would be open to OHV travel. Impacts on water resources associated with increased OHV travel include destabilized soils and erosion, as well as pollutants that can cause sedimentation and water quality impacts (see **Table 3-33**).

Under Alternative A, within GSENM's watersheds, 630,400 acres would continue to be open to ROW authorization; 332,800 acres would continue to be managed as ROW avoidance areas; 881,300 acres would continue to be managed as ROW exclusion areas; and 21,100 acres would continue to be managed as ROW seasonal avoidance areas. Impacts on water resources associated with increased travel and transportation include destabilized soils and erosion, which can cause sedimentation and turbid water (see **Table 3-32**).

**Table 3-31. Watersheds and Associated Acreage of Livestock Management Allocations by Alternative**

| Watershed                         | Acreage within BLM-managed Grazing Allotments (% of the Total Watershed) | Total Acreage | Management Decision               | Acres of Grazing Allotments Managed by BLM in GSENM and Glen Canyon |               |               |               |               |
|-----------------------------------|--|---------------|-----------------------------------|---|---------------|---------------|---------------|---------------|
|                                   |  |               |                                   | Alternative A   | Alternative B | Alternative C | Alternative D | Alternative E |
| Aztec Creek-Lake Powell           | 88,800 (38)  | 235,300       | Available for livestock grazing   | 52,800  | 52,800        | 52,800        | 52,800        | 24,200        |
|                                   |  |               | Unavailable for livestock grazing | 36,100  | 36,100        | 36,100        | 36,100        | 7,500         |
| Boulder Creek-Escalante River     | 93,700 (40)  | 233,700       | Available for livestock grazing   | 87,100  | 46,700        | 46,700        | 19,600        | 54,000        |
|                                   |  |               | Unavailable for livestock grazing | 6,500   | 47,000        | 47,000        | 74,100        | 39,200        |
| Croton Canyon                     | 129,300 (99)   | 130,400       | Available for livestock grazing   | 129,300   | 129,300       | 129,300       | 39,600        | 121,800       |
|                                   |  |               | Unavailable for livestock grazing | —   | —             | --            | 89,700        | —             |
| Escalante River-Colorado River    | 8,700 (5)  | 182,029       | Available for livestock grazing   | 8,300   | 8,300         | 8,300         | 8,300         | —             |
|                                   |  |               | Unavailable for livestock grazing | 400   | 400           | 400           | 400           | —             |
| Fortymile Gulch-Escalante River   | 162,500 (84)   | 194,600       | Available for livestock grazing   | 153,500   | 153,500       | 153,500       | 153,400       | 102,900       |
|                                   |  |               | Unavailable for livestock grazing | 9,100   | 9,100         | 9,100         | 9,200         | 200           |
| Hackberry Canyon-Cottonwood Creek | 69,300 (100)   | 69,300        | Available for livestock grazing   | 68,100  | 68,100        | 68,100        | 600           | 68,100        |
|                                   |  |               | Unavailable for livestock grazing | 1,300   | 1,300         | 1,300         | 68,700        | —             |
| Halls Creek                       | 4,000 (4)  | 113,200       | Available for livestock grazing   | 1,500   | 1,500         | 1,500         | 1,100         | 1,500         |
|                                   |  |               | Unavailable for livestock grazing | 2,500   | 2,500         | 2,500         | 2,900         | 2,500         |
| Harris Wash                       | 141,500 (85)   | 166,000       | Available for livestock grazing   | 138,500   | 138,500       | 138,500       | 138,500       | 130,500       |
|                                   |  |               | Unavailable for livestock grazing | 3,000   | 3,000         | 3,000         | 3,000         | 100           |

3. Affected Environment and Environmental Consequences (Water Resources)

| Watershed                    | Acreage within BLM-managed Grazing Allotments (% of the Total Watershed) | Total Acreage | Management Decision               | Acres of Grazing Allotments Managed by BLM in GSENM and Glen Canyon |               |               |               |               |
|------------------------------|--|---------------|-----------------------------------|---|---------------|---------------|---------------|---------------|
|                              |  |               |                                   | Alternative A   | Alternative B | Alternative C | Alternative D | Alternative E |
| Headwaters Escalante River   | 35,500 (17)  | 204,100       | Available for livestock grazing   | 34,800  | 32,100        | 32,100        | 31,800        | 8,900         |
|                              |  |               | Unavailable for livestock grazing | 600   | 3,400         | 3,400         | 3,700         | 3,300         |
| Horse Canyon-Escalante River | 171,100 (88)   | 194,300       | Available for livestock grazing   | 144,500   | 129,300       | 129,300       | 28,200        | 130,800       |
|                              |  |               | Unavailable for livestock grazing | 26,600  | 41,700        | 41,700        | 142,800       | 32,200        |
| Kanab Creek Headwaters       | 3,200 (3)  | 124,200       | Available for livestock grazing   | 3,200   | 3,200         | 3,200         | 3,200         | 2,100         |
|                              |  |               | Unavailable for livestock grazing | —   | —             | —             | —             | —             |
| Last Chance Creek            | 165,300 (94)   | 175,800       | Available for livestock grazing   | 165,300   | 165,300       | 165,300       | 10,900        | 141,600       |
|                              |  |               | Unavailable for livestock grazing | —   | —             | —             | 154,400       | —             |
| Lower Buckskin Gulch         | 11,700 (10)  | 122,100       | Available for livestock grazing   | 11,700  | 11,700        | 11,700        | 6,100         | 6,300         |
|                              |  |               | Unavailable for livestock grazing | —   | —             | —             | 5,700         | —             |
| Lower Wahweap Creek          | 79,300 (52)  | 152,600       | Available for livestock grazing   | 79,300  | 79,300        | 79,300        | 40,300        | 62,400        |
|                              |  |               | Unavailable for livestock grazing | —   | —             | —             | 38,900        | —             |
| Middle Paria River           | 134,200 (93)   | 143,900       | Available for livestock grazing   | 129,000   | 129,000       | 129,000       | 14,800        | 115,700       |
|                              |  |               | Unavailable for livestock grazing | 5,200   | 5,200         | 5,200         | 119,400       | 13,000        |
| Moody Creek-Escalante River  | 110,800 (68)   | 163,800       | Available for livestock grazing   | 67,800  | 67,800        | 67,800        | 67,800        | 29,500        |
|                              |  |               | Unavailable for livestock grazing | 43,100  | 43,100        | 43,100        | 43,100        | 700           |
| Sheep Creek                  | 43,000 (68)  | 63,100        | Available for livestock grazing   | 41,500  | 24,700        | 24,700        | 5,300         | 22,600        |
|                              |  |               | Unavailable for livestock grazing | 1,500   | 18,200        | 18,200        | 37,600        | 18,900        |



3. Affected Environment and Environmental Consequences (Water Resources)

| Watershed                            | Acreage within BLM-managed Grazing Allotments (% of the Total Watershed) | Total Acreage | Management Decision               | Acres of Grazing Allotments Managed by BLM in GSENM and Glen Canyon |               |               |               |               |
|--------------------------------------|--|---------------|-----------------------------------|---|---------------|---------------|---------------|---------------|
|                                      |  |               |                                   | Alternative A   | Alternative B | Alternative C | Alternative D | Alternative E |
| Twentymile Wash-Twentyfive Mile Wash | 139,300 (100)  | 139,300       | Available for livestock grazing   | 135,100   | 135,100       | 135,100       | 90,700        | 131,500       |
|                                      |  |               | Unavailable for livestock grazing | 4,300   | 4,300         | 4,300         | 48,700        | 800           |
| Upper Buckskin Gulch                 | 170,500 (90)   | 189,900       | Available for livestock grazing   | 163,800   | 163,700       | 163,700       | 23,200        | 152,600       |
|                                      |  |               | Unavailable for livestock grazing | 6,700   | 6,800         | 6,800         | 147,300       | 3,200         |
| Upper Johnson Wash                   | 102,600 (56)   | 183,800       | Available for livestock grazing   | 99,000  | 99,000        | 99,000        | 27,300        | 83,000        |
|                                      |  |               | Unavailable for livestock grazing | 3,600   | 3,600         | 3,600         | 75,300        | 1,700         |
| Upper Paria River                    | 103,700 (61)   | 169,300       | Available for livestock grazing   | 100,200   | 100,200       | 100,200       | 200           | 87,500        |
|                                      |  |               | Unavailable for livestock grazing | 3,500   | 3,500         | 3,500         | 103,500       | 4,400         |
| Upper Wahweap Creek                  | 135,800 (99)   | 137,400       | Available for livestock grazing   | 135,800   | 135,800       | 135,800       | 44,300        | 135,800       |
|                                      |  |               | Unavailable for livestock grazing | —   | —             | —             | 91,500        | —             |
| Warm Creek                           | 123,700 (93)   | 132,900       | Available for livestock grazing   | 123,700   | 123,700       | 123,700       | 96,800        | 97,800        |
|                                      |  |               | Unavailable for livestock grazing | —   | —             | —             | 26,900        | —             |
| West Canyon Creek-Lake Powell        | 17,800 (13)  | 140,900       | Available for livestock grazing   | 17,800  | 17,800        | 17,800        | 9,100         | 2,000         |
|                                      |  |               | Unavailable for livestock grazing | —   | —             | —             | 8,700         | —             |
| White Sage Wash                      | 26,400 (19)  | 137,000       | Available for livestock grazing   | 26,000  | 26,000        | 26,000        | 7,600         | 24,400        |
|                                      |  |               | Unavailable for livestock grazing | 400   | 400           | 400           | 18,800        | 400           |

Source: BLM GIS 2022

**Table 3-32. Watersheds and Associated Acreage of Rights-of-Way Management by Alternative**

| Watershed                         | Acreage within the Decision Area (% of the Total Watershed) | Total Acreage | Management                | Acres within GSENM Boundary |               |               |               |               |
|-----------------------------------|---|---------------|---------------------------|-----------------------------|---------------|---------------|---------------|---------------|
|                                   |   |               |                           | Alternative A               | Alternative B | Alternative C | Alternative D | Alternative E |
| Aztec Creek-Lake Powell           | 31,700 (13)   | 235,300       | Open to ROW authorization | 400                         | 0             | 0             | 0             | 0             |
|                                   |   |               | ROW avoidance area        | 900                         | 0             | 0             | 0             | 0             |
|                                   |   |               | ROW exclusion area        | 30,400                      | 31,700        | 31,700        | 31,700        | 31,700        |
| Boulder Creek-Escalante River     | 93,600 (40)   | 233,700       | Open to ROW authorization | 12,700                      | 12,200        | 0             | 0             | 0             |
|                                   |   |               | ROW avoidance area        | 4,600                       | 7,300         | 9,100         | 2,400         | 7,100         |
|                                   |   |               | ROW exclusion area        | 75,900                      | 73,700        | 84,100        | 90,800        | 86,100        |
| Croton Canyon                     | 121,800 (93)  | 130,400       | Open to ROW authorization | 17,300                      | 0             | 0             | 0             | 0             |
|                                   |   |               | ROW avoidance area        | 7,900                       | 16,800        | 4,100         | 100           | 4,100         |
|                                   |   |               | ROW exclusion area        | 96,600                      | 105,000       | 117,700       | 121,700       | 117,700       |
| Fortymile Gulch-Escalante River   | 103,000 (53)  | 194,600       | Open to ROW authorization | 60,700                      | 0             | 0             | 0             | 0             |
|                                   |   |               | ROW avoidance area        | 7,300                       | 54,000        | 49,700        | 7,200         | 37,200        |
|                                   |   |               | ROW exclusion area        | 35,000                      | 49,000        | 53,400        | 95,800        | 65,800        |
| Hackberry Canyon-Cottonwood Creek | 69,300 (100)  | 69,300        | Open to ROW authorization | 0                           | 4,700         | 0             | 0             | 0             |
|                                   |   |               | ROW avoidance area        | 18,900                      | 12,800        | 13,600        | 0             | 11,900        |
|                                   |   |               | ROW exclusion area        | 49,200                      | 50,600        | 54,500        | 68,100        | 56,200        |
| Halls Creek                       | 4,000 (4)   | 113,200       | Open to ROW authorization | 0                           | 300           | 0             | 0             | 0             |
|                                   |   |               | ROW avoidance area        | 4,000                       | 3,700         | 2,400         | 0             | 600           |
|                                   |   |               | ROW exclusion area        | 0                           | 0             | 1,600         | 4,000         | 3,400         |
| Harris Wash                       | 131,700 (79)  | 166,000       | Open to ROW authorization | 56,200                      | 4,900         | 0             | 0             | 0             |
|                                   |   |               | ROW avoidance area        | 21,900                      | 72,000        | 35,900        | 9,700         | 33,000        |
|                                   |   |               | ROW exclusion area        | 52,400                      | 53,800        | 94,700        | 120,900       | 97,600        |
| Headwaters Escalante River        | 12,300 (6)  | 204,100       | Open to ROW authorization | 4,900                       | 3,900         | 0             | 0             | 0             |
|                                   |   |               | ROW avoidance area        | 3,700                       | 5,000         | 5,200         | 500           | 5,200         |
|                                   |   |               | ROW exclusion area        | 3,600                       | 3,300         | 7,000         | 11,700        | 7,000         |
| Horse Canyon-Escalante River      | 163,000 (84)  | 194,300       | Open to ROW authorization | 43,100                      | 5,200         | 0             | 0             | 0             |
|                                   |   |               | ROW avoidance area        | 43,400                      | 75,800        | 66,200        | 2,600         | 55,800        |
|                                   |   |               | ROW exclusion area        | 76,500                      | 82,000        | 96,700        | 160,300       | 107,200       |
| Kanab Creek Headwaters            | 2,200 (2)   | 124,200       | Open to ROW authorization | 2,100                       | 0             | 0             | 0             | 0             |
|                                   |   |               | ROW avoidance area        | 0                           | 2,200         | 2,200         | 2,200         | 2,200         |
|                                   |   |               | ROW exclusion area        | 0                           | 0             | 0             | 0             | 0             |
| Last Chance Creek                 | 141,600 (81)  | 175,800       | Open to ROW authorization | 26,900                      | 0             | 0             | 0             | 0             |
|                                   |   |               | ROW avoidance area        | 16,000                      | 30,800        | 19,600        | 100           | 17,400        |
|                                   |   |               | ROW exclusion area        | 98,700                      | 110,800       | 122,000       | 141,600       | 124,200       |

3. Affected Environment and Environmental Consequences (Water Resources)

| Watershed                            | Acreage within the Decision Area (% of the Total Watershed) | Total Acreage | Management                  | Acres within GSENM Boundary |               |               |               |               |
|--------------------------------------|---|---------------|-----------------------------|-----------------------------|---------------|---------------|---------------|---------------|
|                                      |   |               |                             | Alternative A               | Alternative B | Alternative C | Alternative D | Alternative E |
| Lower Buckskin Gulch                 | 6,300 (5)   | 122,100       | Open to ROW authorization   | 4,600                       | 0             | 0             | 0             | 0             |
|                                      |   |               | ROW avoidance area          | 1,700                       | 6,300         | 6,300         | 5,900         | 6,300         |
|                                      |   |               | ROW exclusion area          | 0                           | 0             | 0             | 400           | 0             |
| Lower Wahweap Creek                  | 62,400 (41)   | 152,600       | Open to ROW authorization   | 28,900                      | 2,200         | 0             | 0             | 0             |
|                                      |   |               | ROW avoidance area          | 12,400                      | 37,300        | 19,600        | 4,000         | 12,200        |
|                                      |   |               | ROW exclusion area          | 21,000                      | 22,900        | 42,800        | 58,300        | 50,200        |
| Middle Paria River                   | 132,700 (92)  | 143,900       | Open to ROW authorization   | 37,000                      | 12,700        | 4,200         | 1,000         | 4,200         |
|                                      |   |               | ROW avoidance area          | 19,000                      | 41,500        | 38,200        | 28,800        | 38,200        |
|                                      |   |               | ROW exclusion area          | 68,800                      | 73,000        | 82,600        | 95,300        | 82,700        |
|                                      |   |               | ROW seasonal avoidance area | 3,900                       | 1,500         | 3,600         | 3,600         | 3,600         |
| Moody Creek-Escalante River          | 30,200 (18)   | 163,800       | Open to ROW authorization   | 11,200                      | 0             | 0             | 0             | 0             |
|                                      |   |               | ROW avoidance area          | 11,900                      | 23,100        | 600           | 200           | 400           |
|                                      |   |               | ROW exclusion area          | 7,100                       | 7,100         | 29,600        | 30,000        | 29,800        |
| Sandy Creek-Fremont River            | 200 (<1)  | 245,500       | Open to ROW authorization   | 0                           | 0             | 0             | 0             | 0             |
|                                      |   |               | ROW avoidance area          | 200                         | 200           | 200           | 0             | 0             |
|                                      |   |               | ROW exclusion area          | 0                           | 0             | 0             | 200           | 200           |
| Sheep Creek                          | 42,900 (68)   | 63,100        | Open to ROW authorization   | 21,800                      | 500           | 0             | 0             | 0             |
|                                      |   |               | ROW avoidance area          | 11,200                      | 31,900        | 31,900        | 7,100         | 21,300        |
|                                      |   |               | ROW exclusion area          | 8,400                       | 9,000         | 9,500         | 34,400        | 20,200        |
| Twentymile Wash-Twentyfive Mile Wash | 132,200 (95)  | 139,300       | Open to ROW authorization   | 50,900                      | 0             | 0             | 0             | 0             |
|                                      |   |               | ROW avoidance area          | 7,900                       | 54,500        | 44,400        | 5,200         | 27,900        |
|                                      |   |               | ROW exclusion area          | 73,500                      | 77,700        | 87,900        | 127,000       | 104,400       |
| Upper Buckskin Gulch                 | 159,400 (84)  | 189,900       | Open to ROW authorization   | 106,200                     | 13,000        | 4,400         | 800           | 4,400         |
|                                      |   |               | ROW avoidance area          | 12,500                      | 109,600       | 113,100       | 80,800        | 111,600       |
|                                      |   |               | ROW exclusion area          | 25,600                      | 25,600        | 27,600        | 63,500        | 29,100        |
|                                      |   |               | ROW seasonal avoidance area | 11,500                      | 7,600         | 10,700        | 10,700        | 10,700        |
| Upper Johnson Wash                   | 86,600 (47)   | 183,800       | Open to ROW authorization   | 73,300                      | 2,900         | 0             | 0             | 0             |
|                                      |   |               | ROW avoidance area          | 11,300                      | 81,700        | 84,500        | 59,700        | 84,500        |
|                                      |   |               | ROW exclusion area          | 0                           | 0             | 0             | 24,900        | 0             |
|                                      |   |               | ROW seasonal avoidance area | 200                         | 100           | 100           | 100           | 100           |
| Upper Paria River                    | 92,800 (55)   | 169,300       | Open to ROW authorization   | 3,800                       | 18,000        | 0             | 0             | 0             |
|                                      |   |               | ROW avoidance area          | 47,400                      | 35,600        | 43,600        | 2,900         | 43,600        |
|                                      |   |               | ROW exclusion area          | 40,700                      | 38,300        | 48,300        | 89,000        | 48,300        |

3. Affected Environment and Environmental Consequences (Water Resources)

| Watershed                     | Acreage within the Decision Area (% of the Total Watershed) | Total Acreage | Management                  | Acres within GSENM Boundary |               |               |               |               |
|-------------------------------|---|---------------|-----------------------------|-----------------------------|---------------|---------------|---------------|---------------|
|                               |   |               |                             | Alternative A               | Alternative B | Alternative C | Alternative D | Alternative E |
| Upper Wahweap Creek           | 135,800 (99)  | 137,400       | Open to ROW authorization   | 7,200                       | 0             | 0             | 0             | 0             |
|                               |   |               | ROW avoidance area          | 43,600                      | 40,400        | 36,200        | 0             | 17,800        |
|                               |   |               | ROW exclusion area          | 84,900                      | 95,400        | 99,600        | 135,800       | 118,000       |
| Warm Creek                    | 97,800 (74)   | 132,900       | Open to ROW authorization   | 43,500                      | 1,000         | 0             | 0             | 0             |
|                               |   |               | ROW avoidance area          | 23,300                      | 61,900        | 27,700        | 400           | 27,700        |
|                               |   |               | ROW exclusion area          | 31,000                      | 34,900        | 70,200        | 97,500        | 70,200        |
| West Canyon Creek-Lake Powell | 2,000 (1)   | 140,900       | Open to ROW authorization   | 0                           | 0             | 0             | 0             | 0             |
|                               |   |               | ROW avoidance area          | 0                           | 0             | 0             | 0             | 0             |
|                               |   |               | ROW exclusion area          | 2,000                       | 2,000         | 2,000         | 2,000         | 2,000         |
| White Sage Wash               | 24,800 (18)   | 137,000       | Open to ROW authorization   | 17,700                      | 3,600         | 2,300         | 500           | 2,300         |
|                               |   |               | ROW avoidance area          | 1,500                       | 17,000        | 17,400        | 15,100        | 17,400        |
|                               |   |               | ROW exclusion area          | 0                           | 0             | 0             | 4,100         | 0             |
|                               |   |               | ROW seasonal avoidance area | 5,500                       | 4,200         | 5,000         | 5,000         | 5,000         |

Source: BLM GIS 2022  
 Acres are all within GSENM's boundary.

**Table 3-33. Watersheds and Associated Acreage of Travel Management Allocations by Alternative**

| Watershed                         | Acreage within the Decision Area (% of the Total Watershed) | Total Acreage | Management Direction                    | Acres within GSENM Boundary |               |               |               |               |
|-----------------------------------|---|---------------|---|-----------------------------|---------------|---------------|---------------|---------------|
|                                   |   |               |   | Alternative A               | Alternative B | Alternative C | Alternative D | Alternative E |
| Aztec Creek-Lake Powell           | 31,700 (13)   | 235,300       | Closed to OHV travel                    | 0                           | 31,700        | 31,700        | 31,700        | 31,700        |
|                                   |   |               | OHV travel limited to designated routes | 31,700                      | 0             | 0             | 0             | 0             |
| Boulder Creek-Escalante River     | 93,200 (40)   | 233,700       | Closed to OHV travel                    | 0                           | 81,400        | 84,100        | 90,300        | 86,100        |
|                                   |   |               | OHV travel limited to designated routes | 93,200                      | 11,800        | 9,200         | 2,900         | 7,100         |
| Croton Canyon                     | 121,800 (93)  | 130,400       | Closed to OHV travel                    | 0                           | 104,900       | 117,700       | 118,800       | 117,700       |
|                                   |   |               | OHV travel limited to designated routes | 121,800                     | 16,900        | 4,100         | 3,000         | 4,100         |
| Fortymile Gulch-Escalante River   | 103,000 (53)  | 194,600       | Closed to OHV travel                    | 0                           | 37,600        | 50,000        | 93,300        | 61,500        |
|                                   |   |               | OHV travel limited to designated routes | 103,000                     | 65,500        | 53,000        | 9,800         | 41,500        |
| Hackberry Canyon-Cottonwood Creek | 69,300 (100)  | 69,300        | Closed to OHV travel                    | 0                           | 52,500        | 55,800        | 58,300        | 55,800        |
|                                   |   |               | OHV travel limited to designated routes | 68,100                      | 15,500        | 12,300        | 9,700         | 12,300        |
| Halls Creek                       | 4,000 (4)   | 113,200       | Closed to OHV travel                    | 0                           | 0             | 1,600         | 3,600         | 3,400         |
|                                   |   |               | OHV travel limited to designated routes | 4,000                       | 4,000         | 2,400         | 400           | 600           |
| Harris Wash                       | 130,600 (79)  | 166,000       | Closed to OHV travel                    | 0                           | 54,200        | 94,700        | 115,700       | 97,500        |
|                                   |   |               | OHV travel limited to designated routes | 130,500                     | 76,300        | 35,900        | 14,900        | 33,100        |
|                                   |   |               | Open to OHV travel                      | 100                         | 0             | 0             | 0             | 0             |
| Headwaters Escalante River        | 12,300 (6)  | 204,100       | Closed to OHV travel                    | 0                           | 3,500         | 7,000         | 8,100         | 7,000         |
|                                   |   |               | OHV travel limited to designated routes | 12,200                      | 8,600         | 5,200         | 4,100         | 5,200         |
| Horse Canyon-Escalante River      | 163,000 (84)  | 194,300       | Closed to OHV travel                    | 0                           | 83,600        | 96,700        | 144,500       | 107,100       |
|                                   |   |               | OHV travel limited to designated routes | 163,000                     | 79,400        | 66,300        | 18,500        | 55,900        |
| Kanab Creek Headwaters            | 2,200 (2)   | 124,200       | Closed to OHV travel                    | 0                           | 0             | 0             | 0             | 0             |
|                                   |   |               | OHV travel limited to designated routes | 2,200                       | 2,200         | 2,200         | 2,200         | 2,200         |
| Last Chance Creek                 | 141,600 (81)  | 175,800       | Closed to OHV travel                    | 0                           | 110,700       | 124,100       | 136,900       | 124,100       |
|                                   |   |               | OHV travel limited to designated routes | 141,600                     | 30,900        | 17,500        | 4,700         | 17,500        |

3. Affected Environment and Environmental Consequences (Water Resources)

| Watershed                            | Acreage within the Decision Area (% of the Total Watershed) | Total Acreage | Management Direction                    | Acres within GSENM Boundary |               |               |               |               |
|--------------------------------------|---|---------------|---|-----------------------------|---------------|---------------|---------------|---------------|
|                                      |   |               |   | Alternative A               | Alternative B | Alternative C | Alternative D | Alternative E |
| Lower Buckskin Gulch                 | 6,300 (5)   | 122,100       | Closed to OHV travel                    | 0                           | 0             | 0             | 100           | 0             |
|                                      |   |               | OHV travel limited to designated routes | 6,300                       | 6,300         | 6,300         | 6,200         | 6,300         |
| Lower Wahweap Creek                  | 62,400 (41)   | 152,600       | Closed to OHV travel                    | 0                           | 23,000        | 50,200        | 38,800        | 50,200        |
|                                      |   |               | OHV travel limited to designated routes | 62,400                      | 39,400        | 12,200        | 23,500        | 12,200        |
| Middle Paria River                   | 128,700 (92)  | 143,900       | Closed to OHV travel                    | 600                         | 73,400        | 82,100        | 81,800        | 82,100        |
|                                      |   |               | OHV travel limited to designated routes | 128,100                     | 55,300        | 46,600        | 46,900        | 46,600        |
| Moody Creek-Escalante River          | 30,200 (18)   | 163,800       | Closed to OHV travel                    | 0                           | 7,100         | 29,800        | 30,000        | 29,800        |
|                                      |   |               | OHV travel limited to designated routes | 30,200                      | 23,100        | 400           | 300           | 400           |
| Sandy Creek-Fremont River            | 200 (<1)  | 245,500       | Closed to OHV travel                    | 0                           | 0             | 0             | 200           | 0             |
|                                      |   |               | OHV travel limited to designated routes | 200                         | 200           | 200           | 0             | 200           |
| Sheep Creek                          | 41,500 (68)   | 63,100        | Closed to OHV travel                    | 0                           | 9,000         | 20,100        | 31,100        | 20,100        |
|                                      |   |               | OHV travel limited to designated routes | 41,500                      | 32,500        | 21,300        | 10,300        | 21,300        |
| Twentymile Wash-Twentyfive Mile Wash | 132,200 (95)  | 139,300       | Closed to OHV travel                    | 0                           | 77,500        | 104,100       | 120,400       | 104,300       |
|                                      |   |               | OHV travel limited to designated routes | 132,200                     | 54,800        | 28,200        | 11,800        | 27,900        |
| Upper Buckskin Gulch                 | 155,800 (84)  | 189,900       | Closed to OHV travel                    | 800                         | 25,500        | 29,000        | 48,200        | 29,000        |
|                                      |   |               | OHV travel limited to designated routes | 155,000                     | 130,300       | 126,800       | 107,600       | 126,800       |
| Upper Johnson Wash                   | 84,700 (47)   | 183,800       | Closed to OHV travel                    | 0                           | 0             | 0             | 5,200         | 0             |
|                                      |   |               | OHV travel limited to designated routes | 84,700                      | 84,700        | 84,700        | 79,500        | 84,700        |
| Upper Paria River                    | 91,900 (55)   | 169,300       | Closed to OHV travel                    | 0                           | 44,300        | 48,100        | 57,400        | 48,100        |
|                                      |   |               | OHV travel limited to designated routes | 91,900                      | 47,600        | 43,800        | 34,500        | 43,800        |
| Upper Wahweap Creek                  | 135,800 (99)  | 137,400       | Closed to OHV travel                    | 0                           | 95,300        | 110,600       | 129,300       | 117,900       |
|                                      |   |               | OHV travel limited to designated routes | 135,800                     | 40,500        | 25,200        | 6,500         | 17,900        |

3. Affected Environment and Environmental Consequences (Water Resources)

| Watershed                     | Acreage within the Decision Area (% of the Total Watershed) | Total Acreage | Management Direction                    | Acres within GSENM Boundary |               |               |               |               |
|-------------------------------|---|---------------|---|-----------------------------|---------------|---------------|---------------|---------------|
|                               |   |               |   | Alternative A               | Alternative B | Alternative C | Alternative D | Alternative E |
| Warm Creek                    | 97,800 (74)   | 132,900       | Closed to OHV travel                    | 0                           | 34,800        | 70,100        | 92,300        | 70,100        |
|                               |   |               | OHV travel limited to designated routes | 97,800                      | 63,000        | 27,800        | 5,600         | 27,800        |
| West Canyon Creek-Lake Powell | 2,000 (1)   | 140,900       | Closed to OHV travel                    | 0                           | 2,000         | 2,000         | 2,000         | 2,000         |
|                               |   |               | OHV travel limited to designated routes | 2,000                       | 0             | 0             | 0             | 0             |
| White Sage Wash               | 24,800 (18)   | 137,000       | Closed to OHV travel                    | 0                           | 0             | 0             | 0             | 0             |
|                               |   |               | OHV travel limited to designated routes | 24,700                      | 24,700        | 24,700        | 24,700        | 24,700        |

Source: BLM GIS 2022  
 Acres are all within GSENM's boundary.

Under Alternative A, the BLM would continue to manage recreation and visitor services as they were designated under the GSENM RMPs (BLM 2020a) and the KEPA RMP (BLM 2020b). The existing management under Alternative A allows camping adjacent to range facilities and isolated water sources unless otherwise posted. It limits mechanized, nonmechanized, motorized, and nonmotorized events to areas designated for motorized and mechanized use. It also requires the use of disposable, self-contained human waste management systems within 300 feet of water sources, and it requires group size limits to protect riparian and wildlife resources. It also prohibits SRP holders from camping within 200 feet of riparian areas unless SRP holders can demonstrate that there would be no impacts on riparian vegetation or PFC. Limiting travel would include less roads and trails in the area and indirectly protect riparian areas from surface disturbance and sedimentation. Alternative A would protect riparian resources by avoiding paralleling streams unless absolutely necessary. This avoidance would reduce surface disturbance and the subsequent sediment loading. Alternative A would also protect riparian resources by locating stream crossings where the bank is low, the surfaces are firm, and riparian and aquatic ecosystems would be best complemented. Alternative A would designate routes, including hiking and equestrian trails, to avoid sensitive water and soil resources (seeps, springs, and sensitive soils) where monitoring has shown degradation from recreation.

Under Alternative A, the BLM would continue to manage fire resources as they were designated under the GSENM RMPs (BLM 2020a). General goals include protecting life, property, and resource values. General impacts on water resources associated with fire management include erosion and sedimentation, as well as debris flows that can damage ecological function. See **Section 3.13**, Fire and Fuels Management, for more information.

Under Alternative A, the BLM would continue to manage resources as they were designated under the GSENM RMPs (BLM 2020a) and the KEPA RMP (BLM 2020b). Utah's Riparian Protection Area policy requires that new surface-disturbing activities within 330 feet of riparian areas and wetlands are to be avoided unless it can be shown that (1) there are no practical alternatives (such as a designated utility corridor), (2) all long-term impacts could be fully mitigated, or (3) the activity would benefit and enhance the riparian area. Additionally, ROW avoidance would be required. Impacts on water resources associated with vegetation primarily include degradation of soil and erosion as a result of surface-disturbing activities, which can lead to sedimentation of water resources. Under Alternative A, early detection and rapid response of noxious weed species is required to prevent the establishment of these plant species throughout GSENM. Noxious weeds can quickly outcompete native plants.

### **Alternative B**

Under Alternative B, the BLM would manage water resources to maximize the potential for discretionary actions that are compatible with the protection of GSENM objects. This alternative requires that watershed-level restoration or actions would consider hydrological functions and nexuses. It prevents the impairment of water quality through proactive management actions and by ensuring discretionary actions would not degrade water quality; it would implement actions to restore impaired waters listed in the most recent State 305b Water Quality Report, when the extent of impairment can be substantially and measurably remedied through BLM actions.

Alternative B would prevent the loss of water (both surface and groundwater) through proactive management actions and by ensuring discretionary actions minimize water use. It would implement actions to protect and restore the quantity and quality of water (surface and groundwater) within GSENM. It



would allow water sources to be developed to support recreation- and visitor-related uses in high-use areas, such as trailheads and recreational facilities. It would allow for new water developments if they contribute to protection or restoration, or increase the resiliency of GSENM objects. Minimizing water use protects water availability for riparian vegetation, floodplains, wetlands, and other ecologic functions.

Under Alternative B, existing water developments for livestock or wildlife could be maintained or modified, if they protect or restore the resiliency of GSENM objects. Alternative B would prohibit new water developments in natural plant communities that lack invasive species. It also would allow maintenance of existing developments in a manner that minimizes impacts on natural plant communities. Maintenance of water developments has been shown to improve the condition of water sources, specifically springs, across the decision area, especially those developed for livestock and wildlife (Spring Stewardship Institute 2021). It would avoid degradation of water resources from surface or subsurface discretionary actions. Therefore, Alternative B would be more protective of water resources because of the prohibition of new water developments in areas that do not have invasive species present.

Under Alternative B, the BLM would manage resources to maximize the potential for discretionary actions that are compatible with the protection of GSENM objects. Management under Alternative B requires measures that stabilize soils and minimize surface water runoff for actions on slopes greater than 10 percent. It requires avoidance of soil-disturbing, discretionary actions on slopes greater than 30 percent except for emergency stabilization. Impacts on water resources from soil-disturbing activities include erosion and the associated sedimentation of water resources.

Management under Alternative B requires that within 2 years, a land health assessment must be completed, as well as determinations, if needed, on allotments within the following watersheds: Horse Canyon-Escalante River, Last Chance Creek, Upper Paria, Hackberry Canyon-Cottonwood Creek, , Upper Johnson Wash, Upper Buckskin Gulch, Lower Deer Creek, Bear Creek-Boulder Creek, and Middle Paria. Once the assessments, determinations, and fully processed permit renewals have been completed in these watersheds, a plan would be implemented to conduct land health assessments and determinations, and to fully process permit renewals across GSENM, which would be completed within 10 years.

Alternative B would be more protective of water resources than Alternative A if the requirement to complete land health assessments led to the identification of factors that would be addressed in the case that water quality or riparian land health standards were not met.

Similar to Alternative A, Alternative B also would adaptively manage the season of use, duration, and distribution of livestock grazing to meet or move toward meeting BLM Utah Rangeland Health Standards, before considering changes to the stocking rate, including the improvements of livestock distribution through range improvements, salting, supplements, or other techniques; analyzing the adjustment of the season of use, duration, and recovery periods based on monitoring data, during the permit-renewal NEPA process; providing flexibility in grazing dates; and managing for conditions rather than for the calendar year. It also requires temporarily suspending AUMs in allotments during drought years. Under Alternative B, 2,042,100 acres would be available for livestock grazing in watersheds within BLM-managed grazing allotments in GSENM and Glen Canyon (see Table 3-31).

In addition to the allotments that would be unavailable under Alternative A, the Cottonwood pasture of the Deer Creek allotment, the Phipps pasture in the Phipps allotment, McGath Point, and Saltwater Creek would be unavailable to grazing under Alternative B to protect riparian areas. These pastures/allotments

were first made unavailable through a 1999 amendment to the Escalante Management Framework Plan (BLM 1999). The 2020 RMPs made available McGrath Point and Saltwater Creek, although no permits were issued. Because these allotments have not been available for livestock grazing since prior to the 1999 amendment, they have recovered to a substantial level of naturalness which would benefit overall ecological and hydrological functions.

Under Alternative B, it is required that for routes designated for public use, future travel management planning (that is, designating routes as open, limited, or closed) would consider motorized, mechanized, and nonmotorized/nonmechanized route designations and areas of vulnerable soils. Incorporating an analysis of vulnerable soils in future travel management planning could limit travel in increased erosion risk areas.

Under Alternative B, within GSENM's watersheds, 85,100 acres would be open to ROW authorization; 821,500 acres would be managed as ROW avoidance areas; 945,700 acres would be managed as ROW exclusion areas; and 13,300 acres would be managed as ROW seasonal avoidance areas (**Table 3-32**). Impacts on water resources associated with ROW development include destabilized soils and erosion, which can cause sedimentation and turbid water.

Management under Alternative B requires the use of personal waste systems within 330 feet of water sources. Group size limits may also be adjusted to protect other resources values, including riparian areas. Under Alternative B, 952,000 acres within GSENM's watersheds would be closed to OHV travel, and 913,600 acres would have OHV travel limited to designated routes. Impacts on water resources associated with increased OHV travel include destabilized soils, erosion, and pollutants, which can cause sedimentation and water quality impacts (see **Table 3-33**).

Implementation of landscape-scale ecosystem restoration projects to restore functional vegetation communities, as well as the use of wildland fire, would be allowed across GSENM under Alternative B. The BLM would also stabilize, rehabilitate, and restore landscape characteristics after wildland fires to restore native ecosystems. Additionally, under Alternative B, it would be standard that new discretionary actions within 330 feet of riparian areas and wetlands be avoided unless topographic boundaries limit the distance, and the action would result in no adverse impact on riparian areas or wetlands. It would also prohibit discretionary actions within riparian communities associated with hanging gardens. The disturbance and removal of vegetation cause soil degradation and increased erosion, which can lead to sedimentation and water quality impairment in water resources.

### **Alternative C**

Under Alternative C, four management areas similar to those used in the 2000 MMP would be established: front country area, passage area, outback area, and primitive area. Alternative C would be the same as Alternative B in that it would require consideration of hydrological functions and nexuses for watershed-level restoration or actions. It would prevent the impairment of water quality through proactive management actions and ensure discretionary actions would not degrade water quality. It also would implement actions to restore impaired waters listed in the most recent State 305b Water Quality Report, when the extent of impairment can be substantially and measurably remedied through BLM actions; it would prevent the loss of water quantities in GSENM through proactive management actions and ensure discretionary actions minimize water use. It also would implement actions to protect and restore the quantity and quality of water in GSENM. It would prohibit new water developments in natural plant

communities, and it would avoid degradation of water resources from surface or subsurface discretionary actions in all surface and subsurface drinking water protection zones.

**Table 3-34** shows the acres of management areas located in watersheds. Acres included in **Table 3-34** are within GSENM's boundary. Additionally, **Section 3.2**, Soil Resources, and **Figure 3-5 (Appendix A)** discusses and displays site degradation susceptibility in relation to soil stability. See **Section 3.2** for more information on soils.

**Table 3-34. Watersheds and Associated Acreage of Management Areas**

| Watershed                            | Acreage within the Decision Area (% of Total Watershed) | Total Acreage | Acres within GSENM Boundary |              |              |                |
|--------------------------------------|---|---------------|-----------------------------|--------------|--------------|----------------|
|                                      |   |               | Front Country Area          | Passage Area | Outback Area | Primitive Area |
| Aztec Creek-Lake Powell              | 31,700 (13)   | 235,300       | 0                           | 0            | 0            | 31,700         |
| Boulder Creek-Escalante River        | 93,200 (40)   | 233,700       | 3,700                       | 2,500        | 5,200        | 81,900         |
| Croton Canyon                        | 121,800 (93)  | 130,400       | 0                           | 0            | 4,800        | 117,000        |
| Fortymile Gulch-Escalante River      | 103,000 (53)  | 194,600       | 0                           | 8,400        | 53,800       | 40,800         |
| Hackberry Canyon-Cottonwood Creek    | 69,300 (100)  | 69,300        | 0                           | 5,400        | 11,100       | 51,500         |
| Halls Creek                          | 4,000 (4)   | 113,200       | 0                           | 200          | 2,200        | 1,600          |
| Harris Wash                          | 131,700 (79)  | 166,000       | 10,900                      | 3,800        | 22,800       | 93,000         |
| Headwaters Escalante River           | 12,300 (6)  | 204,100       | 2,000                       | 300          | 3,200        | 6,700          |
| Horse Canyon-Escalante River         | 162,900 (84)  | 194,300       | 0                           | 8,200        | 59,700       | 95,100         |
| Kanab Creek Headwaters               | 2,200 (2)   | 124,200       | 0                           | 100          | 2,100        | 0              |
| Last Chance Creek                    | 141,600 (81)  | 175,800       | 0                           | 4,900        | 17,700       | 119,000        |
| Lower Buckskin Gulch                 | 6,300 (5)   | 122,100       | 0                           | 300          | 6,000        | 0              |
| Lower Wahweap Creek                  | 62,400 (41)   | 152,600       | 200                         | 100          | 19,800       | 42,200         |
| Middle Paria River                   | 128,700 (89)  | 143,900       | 12,800                      | 3,400        | 34,200       | 78,300         |
| Moody Creek-Escalante River          | 30,200 (18)   | 163,800       | 0                           | 300          | 500          | 29,500         |
| Sandy Creek-Fremont River            | 200 (<1)  | 245,500       | 0                           | 0            | 200          | 0              |
| Sheep Creek                          | 42,900 (68)   | 63,100        | 0                           | 500          | 32,300       | 8,600          |
| Twentymile Wash-Twentyfive Mile Wash | 132,200 (95)  | 139,300       | 0                           | 7,300        | 40,500       | 84,400         |
| Upper Buckskin Gulch                 | 159,400 (84)  | 189,900       | 1,500                       | 2,900        | 126,000      | 25,400         |
| Upper Johnson Wash                   | 84,700 (46)   | 183,800       | 1,400                       | 800          | 82,500       | 0              |
| Upper Paria River                    | 91,800 (54)   | 169,300       | 3,100                       | 1,300        | 43,000       | 44,300         |
| Upper Wahweap Creek                  | 135,800 (99)  | 137,400       | 0                           | 0            | 37,000       | 98,800         |
| Warm Creek                           | 97,800 (74)   | 132,900       | 0                           | 2,200        | 25,800       | 69,800         |
| West Canyon Creek-Lake Powell        | 2,000 (1)   | 140,900       | 0                           | 0            | 0            | 2,000          |
| White Sage Wash                      | 24,700 (18)   | 137,000       | 800                         | 0            | 23,900       | 0              |

Source: BLM GIS 2022

The protection of the water supply would be more prioritized in Alternative C than Alternative A. This is because Alternative C would allow development and maintenance of water sources to support recreation- and visitor-related uses only in the front country area, rather than the entire decision area, and, as a result, fewer water sources would likely be developed or maintained. For passage, outback, and primitive areas, Alternative C would also be more protective of water supply than Alternative A in that it would prohibit new recreation-related water developments, unless necessary for natural resources

maintenance, or restoration or protection of GSENM objects. Additionally, under Alternative C, new water developments would be prohibited in the primitive area, unless a primary purpose of the water development is to protect or restore the resiliency of GSENM objects. It also would maintain water developments for livestock or wildlife or modify them if they protect, restore, or increase resiliency of GSENM objects.

The BLM would manage soil resources to protect and restore intact and resilient area management to carefully allow for discretionary actions in appropriate settings under Alternative C. Alternative C would require measures to stabilize soils and minimize surface water runoff for actions on slopes greater than 10 percent, which is the same as under Alternative B. Alternative C is also the same as Alternative B in that it requires avoiding soil-disturbing, discretionary actions on slopes greater than 30 percent except for emergency stabilization. Alternative C would be more protective than Alternative A because it prohibits soil-disturbing actions on areas of soil vulnerability where there is increased opportunity for soil erosion in the outback and primitive areas. Impacts on water resources that are associated with soil erosion include increased water turbidity and decreased water quality and aquatic habitat. See **Table 3-34** for a list of departed watersheds and associated acreage that are in the outback and primitive areas.

Under Alternative C, the BLM would not authorize modifications to structural range improvements until a land health assessment and determination are completed for the allotment in the applicable watershed. Any modifications to the structural range improvements must support the achievement of the BLM Utah Standards for Rangeland Health and must ensure that they are consistent with the protection and restoration of GSENM objects. This is more protective than Alternative A, which would not require a land health assessment to be completed before the maintenance and modification of structural range improvements.

Alternative C is the same as Alternative B in that it also would adaptively manage the season of use, duration, and distribution of livestock grazing to meet or move toward meeting BLM Utah Rangeland Health Standards, before considering changes to stocking rate, including the improvements of livestock distribution through range improvements, salting, supplements, or other techniques; analyzing the adjustment of the season of use, duration, and recovery periods based on monitoring data, during the permit-renewal NEPA process; providing flexibility in grazing dates; and managing for conditions rather than for the calendar year. It also would require temporarily suspending AUMs in allotments during drought years. Under Alternative C, 2,042,100 acres would be available for livestock grazing in watersheds within BLM-managed grazing allotments in GSENM and Glen Canyon.

Under Alternative C, route designations would remain as directed under the 2000 MMP and as amended by the 2020 RMPs, until travel management planning is complete. Additionally, for routes designated for public use, management under Alternative C would require future travel management to consider only designating routes beyond those designated in the 2000 MMP that would increase public safety and/or enhance the protection of GSENM objects. Under Alternative C, 1,209,500 acres in GSENM's watersheds would be closed to OHV travel, and 656,100 acres would have OHV travel limited to designated routes. Alternative C also requires that the BLM consider motorized, mechanized, and nonmotorized/nonmechanized route designations, and reduce opportunities for motorized and mechanized travel in areas of vulnerable soils.

Under Alternative C, within GSENM's watersheds, 10,900 acres would be open to ROW authorization within GSENM's departed watersheds; 671,700 acres would be managed as ROW avoidance areas;

1,163,500 acres would be managed as ROW exclusion areas; and 19,500 acres would be managed as ROW seasonal avoidance areas (see **Table 3-32**).

Alternative C is the same as Alternative B in that it would limit or prohibit camping in sensitive resource areas and in different areas. It would require the use of personal waste systems within 330 feet of water sources. Group size limits could also be adjusted to protect other resources values, including riparian areas.

Alternative C would be the same as Alternative B in that it would allow the implementation of landscape-scale ecosystem restoration projects to restore functional vegetation communities. It also would require the use of wildland fire across GSENM for fire suppression. It would also be the same as Alternative B in that it would, where possible, prioritize wildland fire to protect, maintain, and enhance resources and to function in its natural ecological role. The decision to let fires burn would occur if: 1) the fire is naturally caused; 2) the Fire Management Plan identifies the area as one in which fire might be used as a tool and such use is concurred to by an agency administrator or fire escapes initial attack; and 3) the Wildland Fire Decision Support System results in such a decision. Management would be the same as under Alternative B as the BLM would avoid new discretionary actions within 330 feet of riparian areas and wetlands unless topographic boundaries limit the distance, and the action would result in no net loss of riparian areas or wetlands. Alternative C would be the same as Alternative B in that it would prohibit discretionary actions within riparian communities associated with hanging gardens.

#### **Alternative D**

Under Alternative D, the BLM would manage resources to maximize natural processes by limiting discretionary actions. This alternative would be the same as Alternative B in that it would require consideration of hydrological functions and nexuses for watershed-level restoration or actions. Also, it would prevent the impairment of water quality through proactive management actions and ensure discretionary actions would not degrade water quality. It also would implement actions to restore impaired waters listed in the most recent State 305b Water Quality Report, when the extent of impairment can be substantially and measurably remedied through BLM actions.

Alternative D would prevent the loss of water (surface and groundwater) in GSENM through proactive management actions. It is more protective of water resources because it requires that discretionary actions would not cause a net loss of water quantity in the applicable watershed or aquifer. It would also implement actions that protect and enhance or restore the quantity of water in GSENM, without the development of additional human-made infrastructure.

Unlike Alternative A, Alternative D would prohibit new recreation-related water developments, unless beneficial for natural resource maintenance or restoration, or protection of GSENM objects. Alternative D would prohibit new water developments in natural plant communities that lack invasive species, and existing improvements would be removed unless this would harm resources. Management under Alternative D would prohibit degradation of water resources from surface and subsurface discretionary actions in all surface and groundwater drinking water source-protection zones, culinary water sources, and sole-source aquifers, as identified by the UDEQ, Division of Drinking Water.

The BLM would manage resources to maximize natural processes by limiting discretionary actions in this alternative. Land use allocations would curtail discretionary actions, and the prohibition of soil-disturbing,

discretionary actions on slopes greater than 30 percent except for emergency stabilization would be required. This is more stringent than Alternative A, which does not require avoidance of actions on slopes greater than 30 percent.

Under Alternative D, within GSENM watersheds, 2,300 acres would be open to ROW authorization; 235,000 acres would be managed as ROW avoidance areas; 1,608,800 acres would be managed as ROW exclusion areas; and 19,500 acres would be managed as ROW seasonal avoidance areas (see **Table 3-32**).

Under Alternative D, the BLM would complete land health assessments and determinations (if needed), and fully process permit renewals across GSENM within 10 years. If a land health determination indicates that grazing use is not consistent with the provisions of 43 CFR 4180, then the permitted use must decrease in accordance with 43 CFR 4110.3-2, and the BLM must make changes to grazing practices to support the achievement of the BLM Utah Standards for Rangeland Health.

Alternative D is the same as Alternative B in that it also would adaptively manage the season of use, duration, and distribution of livestock grazing to meet or move toward meeting BLM Utah Rangeland Health Standards, before considering changes to the stocking rate, including the improvements of livestock distribution through range improvements, salting, supplements, or other techniques; analyzing the adjustment of the season of use, duration, and recovery periods based on monitoring data, during the permit-renewal NEPA process; providing flexibility in grazing dates; and managing for conditions rather than for the calendar year. It also requires temporarily suspending AUMs in allotments during drought years. Under Alternative D, 918,300 acres would be available for grazing in watersheds within allotments in GSENM and Glen Canyon (see **Table 3-31**), which is 48 percent less available acreage than under Alternative A. This reduction in available acreage would reduce any impacts grazing would have on watershed health, such as increased turbidity or sedimentation and decreased water quality.

Alternative D would be more protective of water resources than Alternative A because of the requirement to complete land health assessments.

Route designations would remain as directed under the 2000 MMP, until travel management planning is complete. For routes designated for public use, future travel management would prohibit the designation of routes not included in the 2000 GSENM TMP for public use, as modified by ongoing planning processes, unless they are needed for public safety. This alternative would designate more lands as closed to cross-country OHV travel than any other alternative. Under Alternative D, 1,438,000 acres within GSENM's watersheds would be closed to OHV travel, and 427,600 acres would limit OHV travel to designated routes. The RMP also requires the BLM to consider motorized, mechanized, and nonmotorized/nonmechanized route designations, and eliminate motorized and mechanized travel in areas of vulnerable soils. These restrictions would protect water resources by reducing the potential for sedimentation and erosion.

Under Alternative D, camping would only be allowed in developed campgrounds or designated camping areas. Alternative D would require the use of personal waste systems within 300 feet of water sources. Group size limits could also be adjusted to protect other resource values, including riparian areas.

Alternative D would be mostly the same as Alternative B in that it would implement landscape-scale ecosystem restoration projects to restore functional vegetation communities; however, the vegetation communities would be native, and there would be a prioritization of natural processes and techniques

over other methods. Alternative D would be the same as Alternative B in that it would use wildland fire throughout GSENM. It also would be similar to Alternative B in that it would stabilize, rehabilitate, and restore landscape characteristics after wildland fires to enhance and restore native ecosystems; however, it would prioritize natural processes over other methods.

This alternative would be similar to Alternative B in that management would avoid new discretionary actions within 330 feet of riparian areas and wetlands unless topographic boundaries limit the distance; however, the management action would enhance riparian areas and wetlands, rather than result in no adverse impacts on riparian areas and wetlands. Alternative D would be the same as Alternative B in that it would prohibit discretionary actions within riparian communities associated with hanging gardens.

### **Alternative E**

Under Alternative E, the BLM would manage water resources similar to that discussed above in Alternative C. This alternative requires that watershed-level restoration or actions would consider hydrological functions. It prevents the impairment of water quality by prohibiting discretionary actions that would contribute to the listing of waterbodies as impaired; it would implement actions to restore impaired waters listed in the most recent State 305b Water Quality Report, when the extent of impairment can be substantially and measurably remedied through BLM actions.

Alternative E would prevent the loss of water (both surface and groundwater) through proactive management actions and by ensuring discretionary actions minimize water use. It would manage aquatic habitat and water uses to help increase climate resiliency in consideration of expected changes in water availability. It would implement actions to protect and restore the quantity and quality of water (surface and groundwater) within GSENM. Similar to Alternative C, it would allow water sources to be developed to support recreation- and visitor-related uses in the front county areas.

The protection of the water supply would be more prioritized under Alternative E than Alternative A. Alternative E would be more protective of water supply than Alternative A in that it would prohibit new recreation-related water developments, unless a consistent with the protection of GSENM objects. Minimizing water use protects water availability for riparian vegetation, floodplains, wetlands, and other ecologic functions.

Under Alternative E, existing water developments for livestock or wildlife would be maintained. Alternative E also allows modification of existing water developments and new water developments, if both the water development and the modification or construction of the development are consistent with the protection of GSENM objects and only if a land health assessment has been completed in the last 10 years, and, if needed, a causal factor determination has been made for the allotment. Alternative E prohibits new water developments in the primitive areas unless the primary purpose is to protect or enhance the protection of GSENM objects.

Alternative E would prohibit new water developments in natural plant communities that lack invasive species and are not anthropogenically manipulated unless the water developments enhance the protection of GSENM objects. It also would allow maintenance of existing developments in a manner consistent with the protection of GSENM objects. Maintenance of water developments has been shown to improve the condition of water sources, specifically springs, across the decision area, especially those developed for livestock and wildlife (Spring Stewardship Institute 2021). Therefore, Alternative E would be more

protective of water resources because of the prohibition of new water developments in areas that do not have invasive species present.

Alternative E would require measures to stabilize soils and minimize surface water runoff for actions on slopes greater than 10 percent, which is the same as under Alternatives B, C, and D. Alternative E is also the same as Alternative B and C in that it requires avoiding soil-disturbing, discretionary actions on slopes greater than 30 percent. Alternative E would be more protective than Alternative A because it does not provide any exceptions to the avoidance of soil-disturbing actions on slopes greater than 30 percent. Alternative E would be more protective than Alternative A because it prohibits soil-disturbing actions on areas of soil vulnerability where there is increased opportunity for soil erosion in the outback and primitive areas. Impacts on water resources that are associated with soil erosion include increased water turbidity and decreased water quality and aquatic habitat. See **Table 3-34** for a list of departed watersheds and associated acreage that are in the outback and primitive areas.

Management under Alternative E requires that within 2 years a land health assessment be completed, as well as determinations, if needed, on allotments within the following watersheds: Upper Johnson Wash, Horse Canyon-Escalante River, Last Chance Creek, Upper Paria River, Hackberry Canyon-Cottonwood Creek, Middle Paria River, Upper Buckskin Gulch, Lower Deer Creek, Bear Creek-Boulder Creek. Once the assessments, determinations, and fully processed permit renewals have been completed in these watersheds, a plan would be implemented to conduct land health assessments and causal factor determinations, if needed, and to fully process permit renewals across the remainder of GSENM, which would be completed within 10 years. Alternative E would be more protective of water resources than Alternative A if the requirement to complete land health assessments led to the identification of factors that would be addressed in the case that water quality or riparian land health standards were not met.

In addition to allotments that would be unavailable under Alternative A and Alternative B, four pastures, the Gulch Pasture within the Circle Cliffs Allotment, the Paria River and the Paria Box Pastures within the Cottonwood Allotment, and the Upper River Pasture within the Upper Paria Allotment would be made unavailable for livestock grazing under Alternative E to protect riparian areas, but would allow livestock trailing as necessary for proper management of adjacent or nearby allotments. Making pastures unavailable for livestock grazing would reduce any impacts grazing would have on watershed health, such as increased turbidity or sedimentation and decreased water quality. Under Alternative E, 1,737,300 acres would be available for grazing in watersheds within allotments in GSENM only (see **Table 3-31**), which is 18 percent less available acreage than under Alternative A. This reduction in available acreage would reduce any impacts grazing would have on watershed health, such as increased turbidity or sedimentation and decreased water quality. Additionally, under Alternative E, seasonal reductions in AUMs would be implemented in allotments during drought years.

Under Alternative E, within GSENM's watersheds, 10,900 acres would be open to ROW authorization; 583,400 acres would be managed as ROW avoidance areas; 1,251,800 acres would be managed as ROW exclusion areas; and 19,500 acres would be managed as ROW seasonal avoidance areas (see **Table 3-32**). Impacts on water resources associated with ROW development include destabilized soils and erosion, which can cause sedimentation and turbid water.

Management under Alternative E requires the use of personal waste systems within 330 feet of water sources unless facilities are required. Group size limits may also be adjusted to protect other resource values, including riparian areas.



Under Alternative E, 1,245,700 acres within GSENM's watersheds would be closed to OHV travel and 619,900 acres would have OHV travel limited to designated routes. Impacts on water resources associated with increased OHV travel include destabilized soils, erosion, and pollutants, which can cause sedimentation and water quality impacts (see **Table 3-33**).

Implementation of landscape-scale ecosystem restoration projects to restore functional vegetation communities, as well as the use of wildland fire in its natural ecological role, would be allowed across GSENM under Alternative E.

### **Cumulative Impacts**

The cumulative effects analysis area for water resources is the planning area because it includes all land that would experience impacts from management decisions. The temporal analysis area is the duration of the plan. For water resources, cumulative impacts are those that affect both the surface water features and groundwater features in the planning area. Reasonably foreseeable future management actions with the potential to affect water resources include acres open to land development, including roads, other ROWs, and other infrastructure. These impacts are qualitatively discussed in terms of area open or closed to authorized OHV use or grazing allotments under all alternatives, as well as potential surface disturbance associated with different resource management strategies to water resources. These impacts are also quantitatively addressed in terms of acres of land that are open or closed to grazing allotments and OHV use.

The cumulative impacts of past and present actions on water resources in the planning area are captured in the description of the *Affected Environment*. In the Colorado Plateau ecoregion, creeks, streams, and rivers have experienced diminished instream flow and altered flow regimes created by dams, channelization, canal systems, and water diversions (Bryce et al. 2012). River flow regulation, channelization, levees, and dikes have eliminated spring flooding in some cases. Ongoing climate trends combine with and exacerbate these conditions. Past land management, including livestock grazing, has contributed to reduced water quality and quantity. Past and present actions also include watershed improvement and invasive plant removal projects, which will contribute to long-term reduction of erosion and sediment loading and improvements in water quality and quantity.

This analysis assumes that the level of demand for water resources would remain relatively stable over the life of the RMP. It also assumes that water resources could be impacted by additional factors such as wildland fire, changes in vegetation, or recreation and visitor services. Additionally, future management actions or projects related to land development, mineral extraction, habitat restoration, vegetation management, development of livestock wells, and road maintenance also have the potential to impact water resources within GSENM (**Appendix F**, Analytical Framework). Specific actions that may contribute to effects on water resources in the cumulative effects analysis area include the creation and maintenance of ROWs for transmission lines (for example, Garkane Energy's Cottonwood/Cockscomb 138 kilovolt transmission line and the Buckskin to Kanab, Utah and Fredonia, Arizona transmission line, the [Navajo-McCullough Powerline ROW](#)), and water pipelines (Lake Powell Pipeline ROW), water development projects for livestock grazing, and vegetation and watershed restoration projects (for example, the Upper Kanab Creek Watershed EA and KFO Noxious and Invasive Vegetation Management EA).

Under all alternatives, surface-disturbing activities have the potential to create sedimentation that would travel into waterbodies in the planning area. Additionally, under all alternatives, sedimentation can be

expected to be influenced by climate change and increased dry soil that is more easily eroded. For additional information related to soil erosion as a result of passive management, see **Section 3.2**, Soil Resources. Alternatives that prioritize protection and improvement of water resources, including Alternatives C, D, and E, could have fewer contributions toward these effects than Alternatives A and B, which are generally less protective of resources and would allow for more intensive resource uses.

### 3.5 NOXIOUS WEEDS AND INVASIVE, NONNATIVE PLANTS

#### 3.5.1 Affected Environment

##### Current Conditions

This section summarizes, and **Appendix I.5** describes additional context on, the current conditions, trends, and forecasts of noxious weeds and nonnative, invasive plants in GSENM.

Invasive plants are those that are not native and cause or are likely to cause harm to ecology, the economy, or human health (Executive Orders 13112 and 13751). Native plants that can become excessively abundant due to disturbance or other modification of an ecosystem are sometimes also called “invasive” (BLM Handbook H-1740-2; BLM 2008); however, these are excluded here because they typically are not problematic and are not a management focus in the decision area.

Noxious weeds are designated under federal and state noxious weed laws. No federally designated noxious weeds are known to occur in the planning area. Noxious weeds in the planning area are listed under the Utah Noxious Weed Act of 2008. This act defines “noxious weed” as “any plant the commissioner determines to be especially injurious to public health, crops, livestock, land, or other property.”

**Table 3-35** summarizes the noxious weeds documented in the planning area.

**Table 3-35. Noxious Weeds in the Planning Area**

| Name  | Weed Class <sup>1</sup> |
|---|-------------------------|
| Russian knapweed ( <i>Acroptilon repens</i> )         | 3                       |
| Hoary cress or whitetop ( <i>Cardaria draba</i> )     | 3                       |
| Poison hemlock ( <i>Conium maculatum</i> )            | 3                       |
| Field bindweed ( <i>Convolvulus arvensis</i> )        | 3                       |
| Bermudagrass ( <i>Cynodon dactylon</i> )              | 3                       |
| Quackgrass ( <i>Elymus repens</i> )                   | 3                       |
| Scotch thistle ( <i>Onopordum acanthium</i> )         | 3                       |
| Johnsongrass ( <i>Sorghum halepense</i> )             | 3                       |
| Tamarisk or salt cedar ( <i>Tamarix ramosissima</i> ) | 3                       |
| Leafy spurge ( <i>Euphorbia esula</i> )               | 2                       |
| Russian olive ( <i>Elaeagnus angustifolia</i> )       | 4                       |

Sources: Utah Weed Control Association 2022; BLM GIS 2022

<sup>1</sup> Noxious Weed Class Descriptions:

1A = Not known to exist in Utah; significant risk of invasion (none known to be present in GSENM)

1B = Limited distribution in Utah; early detection, rapid response (none known to be present in GSENM)

2 = Widely distributed in Utah; considered controllable

3 = Widely distributed in Utah; considered beyond control; control expansion

4 = Present in Utah; prevent distribution through seed law

While not listed on Utah's Noxious Weed List (Utah Weed Control Association 2022), an invasive plant species of concern and a significant change agent in the region is cheatgrass (*Bromus tectorum*). In GSENM, livestock grazing and vegetation management can increase the risk of cheatgrass invasion and amplify the post-fire risk of invasion.

As ground disturbance associated with human visitation increases in areas of known populations of noxious weeds and invasive plants, the likelihood that noxious weeds and invasive plants would move into disturbed areas also increases due to increased vectors of weed spread. Invasive annual species, such as cheatgrass, will continue to alter fire regimes by facilitating increases in fire frequency and size.

While it is difficult to predict future introductions of noxious weeds and invasive species, the most likely areas for introduction are those where new disturbances occur, particularly in areas where management actions are not implemented after the disturbance. Historical evidence indicates that new weed species introduced to the planning area will establish if they are not eradicated quickly.

### 3.5.2 Environmental Consequences

Refer to **Section F.10**, Noxious Weeds and Invasive, Nonnative Plants, in **Appendix F**, Analytical Framework, for descriptions of the indicators, analysis areas, and assumptions used for the following analysis.

#### **Issue**

- How would proposed vegetation management and land use allocations affect noxious and invasive, nonnative plants?

#### **Impacts Common to All Alternatives**

As described in the affected environment (**Section 3.5.1**), weed spread is often influenced by the extent of disturbed soil and the proximity of established weed infestation to areas of disturbance. Assessing weed spread is based in part on evaluating the difference in frequency, intensity, or type of management activity or natural processes (such as wildfire) that result in significant soil disturbance.

Ground-disturbing vegetation management would increase the risk of noxious and invasive, nonnative species establishment and spread by increasing surface disturbance and vectors of weed spread. See **Section 3.3.2**, Vegetation, *Impacts Common to All Alternatives* for a description of how different vegetation management impacts noxious and invasive, nonnative species establishment and spread. BMPs, identified in **Appendix C**, used under all alternatives to prevent the introduction of noxious and invasive, nonnative plants in accordance with local weed program monitoring protocols would reduce or prevent these impacts.

In the long term, vegetation management would increase vegetation function and resilience by facilitating native shrub and perennial grass and forb cover (Miller et al. 2000) and by increasing resistance to invasive annual grass invasion (Tausch et al. 2009).

Recreation, including OHV use, increases the vectors for weed spread. Invasive, nonnative plant materials can be introduced by recreationists' vehicle tires or undercarriages or on the footwear or clothing of recreationists. These risks are highest around developed campgrounds, in heavily used dispersed areas, and along motorized routes, trails, and trailheads. The probability that noxious and invasive, nonnative

plants will successfully establish depends primarily on several factors, including plant propagule pressure and surface disturbance. The more propagules that are introduced, the more likely that nonnative plants will eventually become established (Von Holle and Simberloff 2005). Where recreation is managed using an SRMA or ERMA on BLM-managed lands, impacts from recreation could be concentrated in one area; however, this could prevent impacts from dispersed recreation elsewhere in GSENM. Further, rules and guidelines in SRMAs and ERMAs would limit or control activities through specialized management tools, such as designated campsites, permits, area closures, and limitations on the number of users, duration of use, and types of events.

Grazing can also increase susceptibility for the introduction and spread of noxious and invasive weeds by degrading the native grass community and creating ground disturbance from the livestock themselves and from maintenance of associated infrastructure. As described in the affected environment (**Section 3.5.1**), livestock grazing is associated with decreased biological soil crust and perennial grass cover and corresponding increases in invasive annual grasses (Duniway et al. 2018). Livestock movement and associated activities, such as the transport of contaminated hay, can also introduce noxious and invasive weeds into new locations. However, all alternatives include management direction to mitigate the risks of these impacts and to emphasize sustainable, healthy rangelands with respect to grazing practices.

Areas identified as avoidance or exclusion for ROWs would reduce the risk of the introduction and spread of noxious and invasive weeds. ROW exclusion areas would reduce this risk to a greater extent than avoidance areas because they would completely prohibit surface-disturbing activities. Limiting vehicle use to designated routes would also reduce the vectors of weed spread across GSENM.

[An integrated weed management program and early detection and rapid response actions would be implemented under all alternatives which would help to reduce the spread and introduction of noxious weeds and invasive, nonnative plant species across the GSENM.](#)

### **Alternative A**

Under Alternative A, current management of terrestrial vegetation would continue under the 2020 Approved RMPs. The condition and trends for noxious weeds and nonnative, invasive species, as summarized in the affected environment (**Section 3.5.1**), would be expected to continue along similar trajectories. The increasing risk of uncharacteristic wildfire due to increasing invasive annual grass cover and fine fuel loads would continue and lead to further invasions and reduced ecological resilience, particularly in the face of climate change and increased drought. Vegetation management, where implemented, would help reduce these risks and help move vegetation conditions toward desired conditions, which includes a reduction in noxious weeds and nonnative, invasive species. Vegetation management under Alternative A would continue focusing on active restoration projects to increase vegetation community resiliency. This would help maintain the extent and function of vegetation communities in the longer term as climate trends become more pronounced. It would also help reduce the introduction and spread of noxious and nonnative, invasive species by increasing biodiversity and resiliency of native vegetation communities. Because vegetation removal and surface disturbance would occur, short-term impacts could occur. As described under *Impacts Common to All Alternatives*, the type of impact and intensity would vary based on the treatment type. The BLM would manage [noxious weeds and invasive, nonnative plants](#) in accordance with local weed program monitoring protocols [and in coordination with local cooperative weed management partnerships](#), which would reduce or prevent these impacts.

Alternative A would provide the most acreage (2,117,300 acres) and AUMs for livestock grazing across all alternatives in the livestock planning area. In these areas, noxious weeds and invasive, nonnative species would likely continue to establish and spread, as described under *Impacts Common to All Alternatives*.

Recreational use is likely to continue to increase within GSENM, which will also increase the potential for noxious weeds and invasive, nonnative species' introduction and spread. Managing 1,500 acres as closed to OHV travel would preclude motorized travel effects on the introduction and spread of noxious and invasive, nonnative species. However, these effects would still be expected to occur alongside designated routes and in areas open to OHV travel.

The BLM would continue to manage approximately 1,865,300 acres as ERMAs, SRMAs, and RMZs. These designations could concentrate impacts from recreation in these areas; however, the rules and guidelines associated with RMAs are designed to reduce recreation's impacts, including noxious weeds and invasive, nonnative species, on all GSENM objects.

Under Alternative A, the BLM would continue to manage 881,300 acres as ROW exclusion areas. The introduction and spread of noxious weeds and nonnative, invasive species would continue to be reduced in these areas by reducing surface-disturbing activities that increase the introduction and spread of these species, as described under *Impacts Common to All Alternatives*. Alternative A would contain the largest amount of acres open to ROW authorization (630,400 acres); therefore, continued introduction and spread would still be expected to occur in these areas.

### **Alternative B**

Vegetation management under Alternative B would be the same as under Alternative A.

Additionally, this alternative includes management direction to complete land health assessments and causal factor determinations within nine HUC-10 and HUC-12 departed watersheds across GSENM within 2 years of signing the ROD. Based on the causal factor determinations, and within 5 years of the signing of the ROD, the BLM would take appropriate actions that would result in significant progress toward fulfillment of the land health standards. This would ensure vegetation management would be carried out in these departed watersheds and that no large-scale impacts from discretionary actions would occur.

Under Alternative B, in addition to the allotments that are unavailable under Alternative A, allotments that do not have a current grazing permit would become unavailable for livestock grazing. This would add approximately 75,200 acres as unavailable for grazing and reduce AUMs by 2,961. This would reduce the risk of noxious and invasive species' establishment and spread in these areas by reducing the vectors of weed spread and disturbance pathways to a greater extent than Alternative A.

Under Alternative B, the BLM would close the only OHV open area that would be open under Alternative A, 100 acres within the Little Desert RMZ. This closure would reduce the potential for the introduction and spread of noxious and nonnative, invasive species. Alternative B would also close approximately 952,000 additional acres where OHV use would be limited to designated routes under Alternative A. Closing areas where OHV travel was previously limited to designated routes would reduce vehicular travel on designated routes and therefore reduce the potential for the introduction and spread of noxious and nonnative, invasive species in these areas.

Under Alternative B, approximately 1,770,100 acres would be designated as ERMA with a [increase](#) in SRMA acreage compared with Alternative A (from [67,600](#) to [95,300](#) acres). Since the acres and management of RMAs would be similar under both alternatives, it is expected that impacts on noxious and nonnative, invasive species from the designation of RMAs under Alternative B would be similar to those described under Alternative A.

[Approximately 945,700 acres](#) would be managed as ROW exclusion areas, [which is 64,400 acres more than](#) under Alternative A; therefore, the reduction in noxious and nonnative, invasive species' introduction and spread from restricting ROW development would be [slightly more than](#) under Alternative A. [However](#), the number of acres that would be open to ROW authorization would be greatly reduced under Alternative B compared with Alternative A ([85,100 acres](#) compared with [630,400 acres](#)). Compared with Alternative A, this would result in a significant reduction in the potential for noxious and nonnative, invasive species' introduction and spread by restricting the potential for ROW development in these areas.

### **Alternative C**

Effects from vegetation management would be similar to those described under Alternative A. However, Alternative C would use an area management approach where the front country, passage, and outback areas would focus on proactive management, while the primitive area would prioritize natural processes. Proactive management in the front country, passage, and outback areas would help move vegetation toward desired conditions, which include a reduction in noxious and nonnative, invasive species, at a faster rate than natural processes. The relative speed and efficacy of movement toward desired conditions would vary depending on the treatment method or combination of treatment methods, as described above in the *Impacts Common to All Alternatives*.

Areas where vegetation has been degraded by invasive annual grass expansion, fire suppression, or excessive livestock grazing may not be able to return to their previous state, or desired conditions, without active management (Briske et al. 2006). Therefore, reducing noxious and nonnative, invasive species in the primitive area may not be achievable under this alternative; this could lead to less resilient vegetation in these areas.

Under Alternative C, [the](#) allotments that would be unavailable [would be the same as](#) under Alternative B. This would reduce the risk of noxious and invasive species' introduction and spread in these areas by reducing the vectors of weed spread and disturbance pathways to a greater extent than Alternative A.

Alternative C would close the only OHV open area that would be open under Alternative A, 100 acres within the Little Desert RMZ. This closure would reduce the potential for the introduction and spread of noxious and nonnative, invasive species. Alternative C would also close [1,209,500](#) acres to OHV use, and OHV use would be limited to designated routes on [656,100](#) acres. Within the areas closed to OHV use, approximately 7 miles of route would be closed (BLM GIS 2022). Closing [this](#) route and areas where OHV travel was [previously limited to designated routes would reduce opportunities to designate new routes available for vehicular travel and](#) therefore, this would reduce the potential for the introduction and spread of noxious and nonnative, invasive species in these areas to a greater degree than under Alternative A.

Under Alternative C, approximately 486,300 acres would be designated as ERMA and [417,400](#) as SRMA. With fewer acres managed as RMAs, there would be fewer restrictions on recreation, which would increase the potential that larger group sizes, less restrictions on camping and campfires, and the

development of facilities could lead to an increase in the degradation of vegetation communities; this would result in vegetation communities that are more susceptible to invasion of noxious and nonnative, invasive species than Alternative A. In general, management for the front country and passage areas would be less limiting while the outback and primitive areas would have more restrictions. These restrictions in the outback and primitive areas would reduce impacts that recreation would have on noxious and nonnative, invasive species.

Under Alternative C, the BLM would manage 1,163,500 acres as ROW exclusion areas; this is 282,200 acres more than under Alternative A. This increase in ROW exclusion areas would reduce the potential for the introduction and spread of noxious and nonnative, invasive species to a greater degree than under Alternative A. The number of acres that would be open to ROW authorization would also be greatly reduced under this alternative compared with Alternative A (10,900 acres compared with 630,400 acres). Compared with Alternative A, this would result in a significant reduction in the potential for noxious and nonnative, invasive species' introduction and spread by restricting the potential for ROW development in these areas.

#### **Alternative D**

Vegetation management under Alternative D would prioritize natural processes and techniques, compared with active restoration under Alternative A. Such means are largely hands off and would result in less restorative changes in vegetation than the Alternatives B and C. This alternative would also preclude using prescribed fire in many areas because prescribed fire likely cannot be used without mechanical pretreatments in much of GSENM. The prioritization of natural processes would likely reduce the number of restoration projects that use active management and rely on passive management. Limiting active management would reduce the short-term direct impacts those projects would have on noxious and nonnative, invasive species, such as increased vectors of weed spread and increased surface disturbance, as described under *Impacts Common to All Alternatives*.

However, the reduction in these projects could also increase the spread of noxious and nonnative, invasive species in the long term. The reliance on passive management could increase the establishment of noxious and invasive species if certain tools and techniques were not authorized to be used. Studies have shown that in some circumstances, such as after wildfire, using passive restoration can lead to high levels of woody fuels that can lead to unnaturally high-intensity fires that can cause more severe damage to vegetation communities, compared with natural fire regimes (Forest Service 2022). Additionally, the reliance on natural processes could lead to restoration projects requiring a longer time to achieve desired conditions compared with active management. In some cases, such as in areas that have been degraded by invasive annual grasses, fire suppression, or excessive livestock grazing, desired conditions for vegetation may not be able to be met without active management (Briske et al. 2006).

Restricting revegetation to native plant materials could increase the cover of native species in project areas, increasing plant community diversity, structure, and function and resistance to invasion. In some situations, however, native species may not compete well in areas with invasive annual grasses (Miller et al. 2015) or nonnative perennial grasses. Revegetation with native plant materials in these areas without pre- and/or post-chemical treatments of invasive annual grasses and nonnative perennial grasses would likely result in the treatment area being reinvaded by these species, or it would require the use of more invasive mechanical methods such as tilling. This would increase the necessity for multiple treatments and slow the movement toward desired conditions where treatments were done. Vegetation communities

without invasive annual grasses as a component of the plant community and buffered from areas where invasive annual grasses occur would be optimal for manual or mechanical planting treatments. Augmentation with native plant material would provide the opportunity to increase the plant communities' resistance and resilience by increasing diversity, structure and function, vigor, and overall health. [The use of nonnative vegetation may be approved in phased restoration efforts that lead towards a native vegetation community or for emergency actions where native vegetation is not reasonably available.](#) Alternative D also includes the management direction to complete land health assessments and, if needed, causal factor determinations across GSENM within 10 years of signing the ROD. This would help ensure that land health standards and movement toward desired conditions for noxious and nonnative, invasive species are being met to a greater extent than under Alternative A, which includes no such direction.

Under Alternative D, in addition to the allotments that are unavailable under Alternative A [and B](#), allotments within departed watersheds would be unavailable for livestock grazing. This would add [1,131,500](#) acres as unavailable for grazing [within GSENM](#) and reduce AUMs by 62,747 (**Table 2-1**). This would reduce the risk of noxious and invasive species' introduction and spread in these areas by reducing the vectors of weed spread and disturbance pathways to a greater extent than under Alternative A.

Alternative D would close approximately [1,438,000](#) acres to OHV use, and OHV use would be limited to designated routes on [427,600](#) acres. Closing areas where OHV travel was previously limited to designated routes would reduce areas available for future travel management planning, reducing potential for vehicular travel on designated routes; this would reduce the potential for the introduction and spread of noxious and nonnative, invasive species in these areas to a greater degree than under Alternative A.

Under Alternative D, approximately 311,900 acres would be designated as ERMA's and 100,300 acres as SRMA's. With fewer restrictions on recreation, there would be the potential that larger group sizes, less restrictions on camping and campfires, and the development of facilities could lead to an increase in the degradation of vegetation communities; this would result in vegetation communities that are more susceptible to invasion of noxious and nonnative, invasive species than under Alternative A.

Under Alternative D, the BLM would manage [1,608,800](#) acres as ROW exclusion areas; this is [727,500](#) acres more than under Alternative A. This increase in ROW exclusion areas would reduce the potential for the introduction and spread of noxious and nonnative, invasive species to a greater degree than under Alternative A. The number of acres that would be open to ROW authorization would also be greatly reduced under Alternative D, compared with Alternative A (2,300 acres compared with [630,400](#) acres). Compared with Alternative A, this would result in a significant reduction in the potential for noxious and nonnative, invasive species' introduction and spread by restricting the potential for ROW development in these areas.

### **Alternative E**

[Impacts on noxious weeds and invasive, nonnative plants would be similar to those described under Alternative C. However, in addition to implementing an integrated weed management plan as under Alternatives A, B, C, and D, Alternative E also includes direction to protect GSENM objects through attention to treatment of weed populations with known potential for affecting areas with high naturalness, new infestations of weeds with high resistance to treatment, and weeds with potential for affecting special status plant and animal species and their habitat. This more explicit management direction would help to](#)



reduce the introduction and spread of noxious and nonnative, invasive weeds in the short term to a greater extent compared with Alternatives A, B, C, and D.

Under Alternative E, livestock grazing would be unavailable on approximately 128,300 acres in GENSM, compared to 123,000 acres under Alternative C. This is 5,300 acres more than Alternative C and 80,500 acres more than Alternative A. Management objectives and goals would be similar to Alternative C. In addition to allotments that would be unavailable under Alternative A and Alternative B, four pastures, the Gulch Pasture within the Circle Cliffs Allotment, the Paria River and the Paria Box Pastures within the Cottonwood Allotment, and the Upper River Pasture within the Upper Paria Allotment would be made unavailable for livestock grazing under Alternative E to protect riparian areas, but would allow livestock trailing as necessary for proper management of adjacent or nearby allotments. Making these pastures unavailable for livestock grazing would reduce grazing impacts on noxious and invasive species' introduction and spread compared to Alternatives B and C.

OHV use under Alternative E would be similar as under Alternative C (1,245,700 acres closed to OHV travel compared with 1,209,500 under C), with (619,900 acres being limited to designated routes). Management would also be similar to that discussed above under Alternative C.

SRMA and ERMA acreage would be the same as Alternative C (417,400 acres SRMA, and 486,300 as ERMA). Management would also be similar to that discussed above in Alternative C.

ROW exclusions under Alternative E would be similar as Alternative C (1,251,800 acres excluded, compared with 1,163,500 under C). ROW avoidance would be similar as Alternative C (583,400 acres avoidance under Alternative E, compared with 671,700 under Alternative C). ROW seasonal avoidance area would be the same as Alternative C (19,500 acres seasonal avoidance). Additionally, open to ROW authorization would be the same as Alternative C (10,900 acres open to ROWs). Management of ROWs under Alternative E would be similar to that discussed above under Alternative C.

### **Cumulative Impacts**

BLM-managed, Forest Service-managed, NPS-managed, and adjacent state, tribal, county, and privately owned land surrounding GSENM are considered to be the cumulative effects analysis area for noxious weeds and nonnative, invasive species. Ongoing and planned actions in and near GSENM would influence noxious weeds and nonnative, invasive species' conditions and management effectiveness on a regional scale. The time frame for cumulative environmental consequences for future actions is 20 years.

Portions of GSENM adjoin other BLM-managed lands, National Forest System lands, national parks, and national recreation areas, each has its own land management plan guiding noxious weeds and nonnative, invasive species management in the administrative area. Noxious weeds and nonnative, invasive species management is becoming more broadly consistent across federal land ownerships, due to updated plan adherence with current federal law, regulation, and policy. Direction for noxious weeds and nonnative, invasive species management in the adjacent agency land management plans is complementary to the proposed plan components for GSENM. This means broad movement toward reducing or eradicating noxious weeds and nonnative, invasive species would be facilitated across administrative boundaries in this region.

The cumulative impacts of past and present actions on noxious weeds and nonnative, invasive species in the planning area are captured in the description of the affected environment (see **Section 3.5.1**).

Primarily, these include frequent, lower-intensity fire prior to Euro-American contact, followed by livestock grazing and fire suppression after Euro-American contact. Fire suppression includes policies established in the early 1900s and carried forward in other forest and land management plans and other state and local policies throughout the broader landscape; these policies have resulted in current vegetation conditions that are departed from historical conditions. This has resulted in a landscape with increased invasive annual grasses and a greater potential for uncharacteristically large, severe fires compared with historical conditions. Ongoing climate trends, including more frequent extreme fire weather, combine with and exacerbate these conditions.

The importance of noxious weeds and nonnative, invasive species management, including fuels treatments, wildland fire management, and managing for wildlife habitat, is widely recognized by state and federal agencies, adjacent landowners, and the general public. Actions taken outside GSENM include federally and state-funded hazardous fuel reduction projects on National Forest System and BLM-managed lands, which generally aim to move vegetation conditions and fuel loading toward historical conditions and restore historical fire regimes. The KFO Noxious and Invasive Vegetation Management Environmental Assessment would continue to guide weed management on lands bordering GSENM; therefore, it would have the potential to reduce weeds coming onto GSENM.

Other vegetation management projects in the cumulative effects analysis area include the Upper Kanab Creek Watershed Environmental Assessment and Color Country vegetation management Environmental Assessment. Additional renewable energy and other ROW projects are in the cumulative effects analysis area, including industrial-scale solar energy development on [Utah Trust Lands Administration \(formerly State of Utah School and Institutional Trust Lands Administration\)](#) lands near Big Water. Other relevant activities include recreation, such as camping and campfire use or OHV use, and continued livestock grazing that could affect the condition of noxious weeds and nonnative, invasive species within the cumulative effects analysis area.

Also, nonfederal land management policies are likely to continue affecting noxious weeds and nonnative, invasive species management around GSENM. The cumulative effects across the large, geographically complex, and diverse cumulative analysis area are difficult to analyze, considering the uncertainties associated with government and private actions, and ongoing changes to the region's economy; however, based on the trends identified in this section, cumulative effects, including increases in recreation, ongoing livestock grazing, and continued housing and commercial development, are likely to continue or increase.

Reasonably foreseeable future actions in GSENM have the potential to impact noxious weeds and nonnative, invasive species; these are generally projects that would substantially increase surface disturbance or increase vectors of weed spread. Projects that are anticipated to alter vegetation conditions include the Skutumpah Terrace Greater Sage-grouse Habitat Restoration Projects and post-fire restoration projects. Projects that may increase the potential for increased invasive weed spread are ROW development projects, including the [Garkane ROWs \(Cottonwood/Cockscomb; Buckskin to Kanab, Utah and Fredonia; Buckskin to Page\)](#), the [Arcadin ROW](#), the [Navajo-McCullough Powerline ROW](#), and [Lake Powell Pipeline ROW](#).

Proposed vegetation management activities, including managing for noxious weeds and nonnative, invasive species, under the alternatives would contribute to the cumulative effects of regional vegetation management by other agencies and stakeholders. These efforts would contribute to landscape restoration and ecological resilience on a larger scale, with a focus on achieving desired vegetation conditions,

restoring more natural fire regimes, and reducing the potential for uncharacteristically large and severe fires; all of these would, in turn, increase resistance to invasive species. The alternatives that prioritize active vegetation and fuels management with a full range of treatment options, including Alternatives A, B, C and E, could have greater contributions toward these effects than Alternative D, which emphasizes passive management and more limited treatment options.

### 3.6 CULTURAL RESOURCES

The analysis area for cultural resources is the decision area. Cultural resources within GSENM span the period of human occupation of the region. Approximately seven percent of the decision area has been inventoried for cultural resources. Based on data from GSENM (BLM GIS 2022), 4,676 cultural resources are currently documented within the decision area; these cover a total area of 12,773 acres. These include 1 National Register-listed site, 1,847 sites that have been determined eligible for the National Register, 611 sites that have been determined not eligible for the National Register, 757 sites that have not been evaluated, and an additional 1,460 sites that do not have National Register eligibility status and should also be considered not evaluated for the National Register (**Table 3-36**).

A predictive model of cultural resource occurrence in GSENM was developed in 2018 by the University of Utah Archaeological Center (Yaworsky et al. 2018) and is referred to as the GSENM Cultural Resource Predictive Model. The model serves to support a Class I Existing Information Inventory of GSENM. The model statistically evaluated the relationships between known site locations and environmental variables to predict the likely occurrence of cultural resources across GSENM. The model was developed by dividing model runs into separate time periods and combined time periods of sites to evaluate the change in site location over time. The final product is an overlay of the various time period models, taking the highest value from any of the models within any given 5-square 2-meter location. The resulting model values range from 0.0 (less probability) to 1.0 (highest probability) and can be interpreted as the percent probability that an archaeological site of any time period is present within the 5-square meter area. In application, the BLM considers any value of 0.6 or greater to be high probability for archaeological resources. **Table 3-37** summarizes the number of acres within the decision area by predictive model classification value of high (.06 to 1.0) and low (.00 to .05). A more thorough description of the methods used in this project can be found in (Yaworsky et al., 2020). These acreages do not include acres outside of the decision area (e.g., livestock grazing allotments or portions of livestock grazing allotments within adjacent Glen Canyon National Recreation Area).

#### 3.6.1 Affected Environment

##### **Current Conditions**

Cultural resources are locations of human activity, occupation, or use that contain materials, structures, or landscapes that were used, built, or modified by people. Cultural resources include archaeological sites, buildings, structures, objects, districts, and locations associated with cultural practices or beliefs of contemporary communities. This section and **Appendix I.6** discuss both prehistoric and historic resources in and around GSENM. The detail provided in Appendix I.6 includes a discussion of regulatory frameworks for cultural resources, a brief outline of the cultural time periods and types of sites present in GSENM and the region, a summary of the previous archaeological investigations and known sites in GSENM (see **Table 3-36**), the cultural resources predictive model developed for GSENM (see **Table 3-37**), and the trends and forecasts of current and future conditions of cultural resources in GSENM.

**Table 3-36. Cultural Resources in the Decision Area by National Register Status**

| <b>National Register Status</b> | <b>Count</b> | <b>Acres</b>  |
|---------------------------------|--------------|---------------|
| Listed                          | 1            | 1             |
| Eligible                        | 1,847        | 5,799         |
| Not eligible                    | 611          | 994           |
| Undetermined                    | 757          | 637           |
| No data                         | 1,460        | 5,343         |
| <b>Total</b>                    | <b>4,676</b> | <b>12,774</b> |

Source: BLM GIS 2022

**Table 3-37. Cultural Resources Predictive Model Classification Acreage in the Planning Area**

| <b>Predictive Model Classification</b> | <b>Acres (rounded)</b> |
|--|------------------------|
| High probability                       | 491,600                |
| Low probability                        | 1,388,800              |
| <b>Total</b>                           | <b>1,880,400</b>       |

Source: BLM GIS 2022

### 3.6.2 Environmental Consequences

Refer to **Section F.11**, Cultural Resources, in **Appendix F**, Analytical Framework, for descriptions of the indicators, analysis areas, and assumptions used for the following analysis.

#### Issues

- How would proposed management impact historic properties?
- How would proposed management protect cultural resources, including traditional cultural landscapes, traditional uses, and historic properties?

#### Impacts Common to All Alternatives

The types of environmental consequences associated with all alternatives are similar in their potential to impact cultural resources and potentially adversely affect historic properties per Section 106. The alternatives are broad in scope and do not indicate specific project-level effects, which would be addressed; if necessary, adverse effects would be avoided, minimized, or mitigated through the Section 106 process. Management actions associated with each alternative all have the potential to affect cultural resources, primarily through ground disturbance and alterations to the setting. However, since these are federal undertakings, the protection of cultural resources would be addressed via Section 106 under all alternatives. Similarly, coordination and consultation with consulting parties, as defined under 36 CFR 800, would also continue in accordance with federal laws and regulations.

Potential threats to cultural resources under all alternatives are those activities not initiated by BLM actions: wildfire, erosion, looting, vandalism, and trespass. However, the extent of unauthorized human actions does have the potential to be curbed in various degrees by the management activities under Alternatives B, C, D, and E.

Potential impacts on cultural resources are increased when visitation and access increase (Nyaupane et al. 2006; Pinter and Kwas 2005). In some cases, motor vehicle access is particularly impactful, as shown in a study at Tonto National Forest that positively correlated the damage to cultural resources through

looting and vandalism with proximity to roads and other vehicular travel routes (Hedquist et al. 2014). The kind or condition of road did not make a significant difference to the level of effects, and the specific impacts included looting, graffiti, removal and reuse of archaeological material (such as stones for fire rings), and vehicle use on and around sites. Hedquist and others (2014) also found that effective measures for mitigating these impacts were travel access restrictions, advisory signage, and site monitoring programs. In other cases, newly created motor vehicle access [for specific infrastructure construction](#) did not create [a similar level of impacts as motor vehicles used for public transportation or recreation](#), as shown in the Falcon to Gonder Transmission Project 5-year Monitoring Study. The goal of this 5-year monitoring study was to document impacts from an increase of traffic to sites related to the construction of a new transmission line and access roads. After watching sites and the individual artifacts within these sites for 5 years, the archaeologists found that increased accessibility [specifically by construction and maintenance crews](#) did not lead to any vandalism or looting. [In an experimental study, Howard \(2016\) found that out of a range of factors, including animal access, slope, and erosion, vehicle access in general also resulted in the highest artifact breakage rates and movement distance.](#)

There is the potential for wildfires to continue under all the alternatives. Wildfires impact cultural resources by burning cultural material and features, decreasing soil stability, increasing erosion, exposing sites to artifact collecting and looting, and changing the overall setting and characteristics of cultural resources. These impacts increase with uncharacteristic wildfires where the size and severity of the fire are greater. Fire also alters the physical and chemical characteristics of artifacts and features that are not consumed by flames via thermal alterations and deposition of soot and tar that can affect analytical analyses, including dating techniques such as thermoluminescences and obsidian hydration analysis (Ryan 2010). Human responses to wildfire, such as the construction of lines and the application of water and foam, can also harm cultural resources both physically and chemically. Climate change has increased the scale and frequency of wildfire's impacts on cultural resources (Davis 2018).

Climate change also accelerates other natural processes that have the potential to physically disturb cultural resources, such as vegetation changes, altered precipitation, increased ice and snowmelt, and accelerated freeze and thaw cycles. All these stressors have the potential to physically move artifacts and accelerate decay (Davis 2018).

Under all alternatives, there are a total of 881,100 acres of WSAs in 16 areas, with identical acreages. The cultural resources in these areas are largely protected from potential impacts, such as ground disturbance or changes in the visual or auditory settings, due to reduced motorized uses and restrictions on development. As the designation of these areas and management are static across all alternatives, they will not be discussed further. Public use categories would also be maintained for Dance Hall Rock.

Livestock grazing would occur to varying degrees under all alternatives and is another stressor that creates potential impacts on cultural resources through breakage of artifacts, mixing of deposition contexts, deterioration of structures, and acceleration of erosion in grazed areas. Experimental studies have shown that livestock trampling impacts both the physical artifacts and features of a site. It also distorts the most common analytical approaches to measuring sites, such as artifact abundance, raw material proportions, and average artifact dimensions (Osborn et al. 1987; Douglass and Wandsnider 2012). Livestock trampling also causes the vertical displacement of artifacts, especially in wet ground (Eren et al. 2010).

BLM-managed grazing allotments that would be unavailable for grazing under all alternatives [are those listed under Alternative A in Section 2.4.3](#). Any cultural resources [in allotments available for livestock](#)

grazing, recorded or yet unknown, would be at risk from impacts from grazing, as described above. However, under Alternative E, the Proposed RMP/Final EIS, the availability to livestock grazing is limited to those allotments and portions of allotments within the GSENM decision, and does not include in Glen Canyon, where the BLM will administer grazing in those areas cooperatively with the NPS.

### **Alternative A**

Under Alternative A, the No Action Alternative, plan elements would remain from the 2020 Approved RMPs. These plan elements include direction for the identification, preservation, and protection of cultural resources; the reduction of threats and conflicts from other resources; restoration and stabilization; opportunities for traditional use; and the development of cultural resource management plans. Aspects of planning management direction unique to Alternative A include the use of the 2020 GSENM-KEPA Final EIS Appendix J (Cultural Resources) criteria to assign cultural resources to use categories.

Alternative A would allow for maximum discretionary actions within GSENM, which in general would include the most acreages open to ROW authorization, recreational facilities, RMAs and RMZs, grazing, OHV use, and a full range of vegetation management. These aspects of Alternative A have the potential to impact cultural resources.

Alternative A would include five SRMAs, two ERMAs, which include 10 RMZs that would cover the entire GSENM. The 2020 Approved RMPs also do not directly address recreational facilities, though there would be few restrictions outside WSAs. Alternative A is the only alternative that would include acreage open to OHV travel. Transportation route maintenance is also not addressed in the 2020 Approved RMPs.

Under Alternative A, the greatest number of acres would be available for livestock grazing, all suspended AUMs would be activated, and new range improvements would be allowed where they are not restricted by another designation. Livestock can impact cultural resources by trampling cultural materials, leaning or rubbing on standing walls and features, and causing soil compaction and wallows within sites. These impacts are greater if livestock infrastructure, such as water troughs, are established within or near cultural resources. A project-specific Section 106 process would be completed prior to installing any new livestock improvements, and range improvements, such as fencing, water troughs, and vegetation management, can also serve to control the location of grazing livestock, and when done in coordination with GSENM staff, this could allow for the avoidance of conflicts with cultural resources. However, existing conflicts would continue without specific management direction to identify and mitigate these impacts.

Alternative A would expose the highest number of known cultural resources, both in total and for eligible resources, to potential impacts from management decisions, including open ROW authorizations, open OHV travel, RMAs, and grazing availability (Table 3-38). While project-specific Section 106 compliance would seek to avoid, minimize, or mitigate any impacts on cultural resources from these management decisions, the risk for unintentional impacts from conflicting uses or impacts on unrecorded resources would be greatest under Alternative A.

**Table 3-38. Numbers of Cultural Resources in Right-of-way, Off-highway Vehicle, Recreation, and Grazing Management Areas by Alternative**

| Management Type               | Alternative A | Alternative B | Alternative C | Alternative D | Alternative E (PRMP) |
|-------------------------------|---------------|---------------|---------------|---------------|----------------------|
| <b>ROW Management</b>         |               |               |               |               |                      |
| <b>ROW open</b>               |               |               |               |               |                      |
| Listed                        | 1             | —             | —             | —             | —                    |
| Eligible                      | 746           | 275           | 44            | 26            | 44                   |
| Not eligible                  | 331           | 162           | 45            | 16            | 45                   |
| Undetermined/no data          | 1,183         | 202           | 42            | 20            | 42                   |
| <i>Subtotal</i>               | <i>2,261</i>  | <i>639</i>    | <i>131</i>    | <i>62</i>     | <i>131</i>           |
| <b>ROW avoidance</b>          |               |               |               |               |                      |
| Listed                        | —             | 1             | 1             | —             | 1                    |
| Eligible                      | 428           | 932           | 1,031         | 498           | 908                  |
| Not eligible                  | 158           | 345           | 412           | 205           | 378                  |
| Undetermined/no data          | 399           | 1,266         | 1,296         | 535           | 1,242                |
| <i>Subtotal</i>               | <i>985</i>    | <i>2,544</i>  | <i>2,713</i>  | <i>1,238</i>  | <i>2,529</i>         |
| <b>ROW seasonal avoidance</b> |               |               |               |               |                      |
| Listed                        | —             | —             | —             | —             | —                    |
| Eligible                      | 117           | 72            | 111           | 111           | 111                  |
| Not eligible                  | 30            | 10            | 25            | 25            | 25                   |
| Undetermined/no data          | 38            | 19            | 32            | 32            | 32                   |
| <i>Subtotal</i>               | <i>185</i>    | <i>101</i>    | <i>168</i>    | <i>168</i>    | <i>168</i>           |
| <b>ROW exclusion</b>          |               |               |               |               |                      |
| Listed                        | —             | —             | —             | 1             | —                    |
| Eligible                      | 697           | 682           | 758           | 1,356         | 888                  |
| Not eligible                  | 135           | 121           | 160           | 407           | 196                  |
| Undetermined/no data          | 778           | 795           | 986           | 1,757         | 996                  |
| <i>Subtotal</i>               | <i>1,610</i>  | <i>1,598</i>  | <i>1,886</i>  | <i>3,521</i>  | <i>2,080</i>         |
| <b>OHV Management</b>         |               |               |               |               |                      |
| <b>OHV closed</b>             |               |               |               |               |                      |
| Listed                        | —             | —             | —             | 1             | —                    |
| Eligible                      | —             | 710           | 838           | 1,017         | 885                  |
| Not eligible                  | —             | 138           | 187           | 261           | 194                  |
| Undetermined                  | —             | 820           | 977           | 1,323         | 984                  |
| <i>Subtotal</i>               | <i>—</i>      | <i>1,668</i>  | <i>2,002</i>  | <i>2,602</i>  | <i>2,063</i>         |
| <b>OHV limited</b>            |               |               |               |               |                      |
| Listed                        | 1             | 1             | 1             | 1             | 1                    |
| Eligible                      | 1,847         | 1,195         | 1,072         | 932           | 1,031                |
| Not eligible                  | 610           | 491           | 445           | 390           | 438                  |
| Undetermined                  | 2,213         | 1,461         | 1,318         | 997           | 1,311                |
| <i>Subtotal</i>               | <i>4,671</i>  | <i>3,148</i>  | <i>2,836</i>  | <i>2,320</i>  | <i>2,781</i>         |
| <b>OHV open</b>               |               |               |               |               |                      |
| Listed                        | —             | —             | —             | —             | —                    |
| Eligible                      | 1             | —             | —             | —             | —                    |
| Not eligible                  | —             | —             | —             | —             | —                    |
| Undetermined                  | —             | —             | —             | —             | —                    |
| <i>Subtotal</i>               | <i>1</i>      | <i>—</i>      | <i>—</i>      | <i>—</i>      | <i>—</i>             |
| <b>Grazing Management</b>     |               |               |               |               |                      |
| <b>Available for grazing</b>  |               |               |               |               |                      |
| Listed                        | 1             | 1             | 1             | —             | 1                    |
| Eligible                      | 1,738         | 1,709         | 1,709         | 614           | 1,711                |

| Management Type                | Alternative A | Alternative B | Alternative C | Alternative D | Alternative E (PRMP) |
|--------------------------------|---------------|---------------|---------------|---------------|----------------------|
| Not eligible                   | 588           | 561           | 561           | 189           | 562                  |
| Undetermined                   | 2,133         | 2,113         | 2,113         | 800           | 2,088                |
| <i>Subtotal</i>                | <i>4,460</i>  | <i>4,384</i>  | <i>4,384</i>  | <i>1,603</i>  | <i>4,362</i>         |
| <b>Unavailable for grazing</b> |               |               |               |               |                      |
| Listed                         | —             | —             | —             | 1             | —                    |
| Eligible                       | 178           | 198           | 198           | 1,278         | 200                  |
| Not eligible                   | 38            | 66            | 66            | 428           | 64                   |
| Undetermined                   | 117           | 138           | 138           | 1,435         | 171                  |
| <i>Subtotal</i>                | <i>333</i>    | <i>402</i>    | <i>402</i>    | <i>3,142</i>  | <i>435</i>           |
| <b>Grazing grand total</b>     | <b>4,793</b>  | <b>4,786</b>  | <b>4,786</b>  | <b>4,745</b>  | <b>4,797</b>         |
| <b>Recreation Management</b>   |               |               |               |               |                      |
| <b>ERMAs</b>                   |               |               |               |               |                      |
| Listed                         | 1             | 1             | —             | —             | —                    |
| Eligible                       | 1,735         | 1,697         | 526           | 319           | 526                  |
| Not eligible                   | 569           | 544           | 179           | 80            | 179                  |
| Undetermined                   | 2,135         | 2,118         | 849           | 163           | 849                  |
| <i>Subtotal</i>                | <i>4,440</i>  | <i>4,360</i>  | <i>1,554</i>  | <i>562</i>    | <i>1,554</i>         |
| <b>SRMAs</b>                   |               |               |               |               |                      |
| Listed                         | —             | —             | —             | —             | —                    |
| Eligible                       | 148           | 264           | 600           | 274           | 600                  |
| Not eligible                   | 59            | 83            | 159           | 78            | 159                  |
| Undetermined                   | 134           | 145           | 343           | 153           | 343                  |
| <i>Subtotal</i>                | <i>341</i>    | <i>492</i>    | <i>1,102</i>  | <i>505</i>    | <i>1,102</i>         |

Source: BLM GIS 2022

Note: Some sites cross multiple management areas within a single alternative. As a result, a small number of sites have been counted more than once in management area subtotals and grand totals.

Alternative A also would include the most acres of high-probability areas (according to the cultural resources predictive model) that would be open to potentially impactful management. This would include the most acres of high-probability areas open to ROW authorization, open to OHV travel, in RMAs, and available to grazing (Table 3-39).

**Table 3-39. Cultural Resources High-Probability Acreage in Right-of-way, Off-highway Vehicle, Recreation, and Grazing Management Areas by Alternative**

| Management Type        | Alternative A  | Alternative B  | Alternative C  | Alternative D  | Alternative E (PRMP) |
|------------------------|----------------|----------------|----------------|----------------|----------------------|
| <b>ROW Management</b>  |                |                |                |                |                      |
| ROW open               | 204,800        | 33,600         | 5,000          | 1,300          | 5,000                |
| ROW avoidance          | 108,400        | 274,600        | 257,900        | 85,000         | 227,800              |
| ROW seasonal avoidance | 16,200         | 9,900          | 15,100         | 15,100         | 15,100               |
| ROW exclusion          | 162,200        | 173,500        | 213,600        | 390,200        | 243,700              |
| <i>Subtotal</i>        | <i>491,600</i> | <i>491,600</i> | <i>491,600</i> | <i>491,600</i> | <i>491,600</i>       |
| <b>OHV Management</b>  |                |                |                |                |                      |
| OHV closed             | 100            | 174,600        | 228,600        | 314,900        | 242,100              |
| OHV limited            | 491,400        | 317,000        | 263,000        | 176,700        | 249,500              |
| OHV open               | 100            | —              | —              | —              | —                    |
| <i>Subtotal</i>        | <i>491,600</i> | <i>491,600</i> | <i>491,600</i> | <i>491,600</i> | <i>491,600</i>       |



| Management Type              | Alternative A  | Alternative B  | Alternative C  | Alternative D  | Alternative E (PRMP) |
|------------------------------|----------------|----------------|----------------|----------------|----------------------|
| <b>Recreation Management</b> |                |                |                |                |                      |
| ERMAs                        | 470,900        | 460,500        | 162,400        | 57,600         | 162,400              |
| SRMAs                        | 20,500         | 32,300         | 91,100         | 28,600         | 91,100               |
| <i>Grand Total</i>           | <i>491,400</i> | <i>492,800</i> | <i>253,500</i> | <i>86,300</i>  | <i>253,500</i>       |
| <b>Grazing Management</b>    |                |                |                |                |                      |
| Available for grazing        | 479,700        | 461,700        | 461,700        | 156,800        | 457,800              |
| Unavailable for grazing      | 11,900         | 29,900         | 29,900         | 334,800        | 33,800               |
| <i>Subtotal</i>              | <i>491,600</i> | <i>491,600</i> | <i>491,600</i> | <i>491,600</i> | <i>491,600</i>       |

Source: BLM GIS 2022

Alternative A would offer the least protection for cultural resources. No new ACECs would be designated, though No Mans Mesa RNA (ACEC) would continue to be managed. Outside WSAs, all lands would be either open or avoidance areas for ROWs, permits, and leases for land and realty development. Lands with wilderness characteristics would not receive any special management strategies that could limit discretionary actions. Alternative A also would include the fewest acres closed to OHV use and grazing.

Alternative A would include the fewest number of known cultural resources that would be protected from potential impacts by lands with wilderness characteristics management strategies and designations of RNAs (ACECs) (Table 3-40). Other management actions that could protect cultural resources, such as areas closed to OHV use, ROW exclusion areas, and lands unavailable for livestock grazing, also contain the fewest number of known sites under Alternative A (see Table 3-38).

**Table 3-40. Numbers of Cultural Resources in Lands with Wilderness Characteristics and Areas of Critical Environmental Concern by Alternative**

| Management Type                         | Alternative A  | Alternative B  | Alternative C  | Alternative D  | Alternative E (PRMP) |
|---|----------------|----------------|----------------|----------------|----------------------|
| <b>LWC Management</b>                   |                |                |                |                |                      |
| <b>LWCs managed to protect</b>          | <b>0</b>       | <b>72,000</b>  | <b>240,600</b> | <b>559,600</b> | <b>329,400</b>       |
| Listed                                  | —              | —              | —              | 1              | —                    |
| Eligible                                | —              | 24             | 83             | 355            | 198                  |
| Not eligible                            | —              | 3              | 26             | 131            | 53                   |
| Undetermined                            | —              | 53             | 193            | 580            | 218                  |
| <i>Subtotal</i>                         | <i>—</i>       | <i>80</i>      | <i>302</i>     | <i>1,067</i>   | <i>469</i>           |
| <b>LWCs managed to minimize</b>         | <b>0</b>       | <b>0</b>       | <b>312,800</b> | <b>0</b>       | <b>224,100</b>       |
| Listed                                  | —              | —              | 1              | —              | 1                    |
| Eligible                                | —              | —              | 271            | —              | 158                  |
| Not eligible                            | —              | —              | 108            | —              | 82                   |
| Undetermined                            | —              | —              | 388            | —              | 364                  |
| <i>Subtotal</i>                         | <i>—</i>       | <i>—</i>       | <i>768</i>     | <i>—</i>       | <i>605</i>           |
| <b>Managed for discretionary action</b> | <b>559,600</b> | <b>487,600</b> | <b>6,100</b>   | <b>0</b>       | <b>6,100</b>         |
| Listed                                  | 1              | 1              | —              | —              | —                    |
| Eligible                                | 355            | 331            | 21             | —              | 21                   |
| Not eligible                            | 131            | 128            | 3              | —              | 3                    |
| Undetermined                            | 580            | 527            | 27             | —              | 27                   |
| <i>Subtotal</i>                         | <i>1,067</i>   | <i>987</i>     | <i>51</i>      | <i>—</i>       | <i>51</i>            |

| Management Type        | Alternative A | Alternative B | Alternative C | Alternative D | Alternative E (PRMP) |
|------------------------|---------------|---------------|---------------|---------------|----------------------|
| <b>ACEC Management</b> |               |               |               |               |                      |
| <b>RNAs (ACECs)</b>    | <b>1,500</b>  | <b>56,300</b> | <b>56,300</b> | <b>1,500</b>  | <b>56,300</b>        |
| Listed                 | —             | —             | —             | —             | —                    |
| Eligible               | —             | 135           | 135           | —             | 135                  |
| Not eligible           | —             | 5             | 5             | —             | 5                    |
| Undetermined           | —             | 316           | 316           | —             | 316                  |
| <i>Subtotal</i>        | <i>—</i>      | <i>456</i>    | <i>456</i>    | <i>—</i>      | <i>456</i>           |

Source: BLM GIS 2022

Note: Some sites cross multiple management areas within a single alternative. As a result, a small number of sites have been counted more than once in management area subtotals and grand totals.

Alternative A would include the lowest acreage of high-probability areas (according to the cultural resources predictive model) that would fall within lands with wilderness characteristics management, ACECs, and RNAs (ACECs) where use restrictions would offer increased protection to cultural resources (Table 3-41). Alternative A also would not employ the cultural resource probability model to inform lands, and realty planning and management directions for ROW avoidance and exclusion.

**Table 3-41. Cultural Resources High-Probability Acreage in Lands with Wilderness Characteristics, Area of Critical Environmental Concern, and Research Natural Area Management Areas by Alternative**

| Management Type                  | Alternative A  | Alternative B  | Alternative C  | Alternative D  | Alternative E (PRMP) |
|----------------------------------|----------------|----------------|----------------|----------------|----------------------|
| <b>LWC Management</b>            |                |                |                |                |                      |
| LWCs managed to protect          | —              | 12,800         | 44,400         | 153,800        | 73,000               |
| LWCs managed to minimize impacts | —              | —              | 105,500        | —              | 76,800               |
| Managed for discretionary action | 153,800        | 141,000        | 3,900          | —              | 3,900                |
| <i>Subtotal</i>                  | <i>153,800</i> | <i>153,800</i> | <i>153,800</i> | <i>153,800</i> | <i>153,800</i>       |
| <b>RNAs (ACECs)</b>              |                |                |                |                |                      |
| <i>RNA (ACEC)</i>                |                |                |                |                |                      |
| Fiftymile Mountain               | —              | 30,700         | 30,700         | —              | 30,700               |
| No Mans Mesa                     | 100            | 100            | 100            | 100            | 100                  |
| <i>Subtotal</i>                  | <i>100</i>     | <i>30,800</i>  | <i>30,800</i>  | <i>100</i>     | <i>30,800</i>        |

Source: BLM GIS 2022

**Impacts Common to the Action Alternatives (B, C, D, and E)**

Under Alternatives B, C, D, and E, the BLM would reduce the number of acreages allotted for management decisions with the potential to impact cultural resources and increase the acreages of designations and exclusions that would protect cultural resources. However, each of these four alternatives includes variations in the number of acres for each management direction; those will be discussed in the following alternative-specific sections.

Under each action alternative (Alternatives B, C, D, and E), plan elements specific to cultural resources would be largely the same or similar. These plan elements are similar in intent to those of Alternative A; however, the reduction of the threats and conflicts, the restoration and stabilization of important and at-risk resources, and providing opportunities for traditional uses would move from being goals and objectives to being management directions. This would make them more action oriented and add detail,

such as specific direction to avoid, reduce, or remove imminent and long-term threats and to identify, monitor, and stabilize at-risk cultural resources. Therefore, Alternatives B, C, D, and E would provide at least a clearer and more action-oriented set of directions that would improve the ability of GSENM staff to provide information and educational resources about cultural resources to the public, compared with Alternative A.

Alternative E, the Proposed RMP, includes management direction similar to Alternatives B, C, and D but was refined slightly in response to public comment, government-to-government consultation, and input from BLM specialists. It was refined to be more inclusive in the management direction to address the deterioration of at-risk cultural resources more generally rather than the direction for stabilization stated in the management direction under alternatives B, C, and D. While this change could result in a range of possible treatment options, including no treatment if deterioration of a certain resource type was agreed to as appropriate. The change was made in response to input that stabilization is not always the preferred course of action for all deteriorating sites, and that case-specific considerations and consultation could result in finding the most appropriate treatment options.

Alternatives B, C, D, and E also would replace the management direction of Alternative A to develop CRMPs for KEPA and GSENM units with direction to develop an implementation-level CRMP to provide guidance on resource- and site-specific strategies to protect resources in place. Alternatives B, C, D, and E also would include a plan element to employ the cultural resources predictive model to manage ROW authorizations in high-probability areas; this is not included under Alternative A. However, Alternative D differs from Alternatives B and C in excluding ROWs in those areas.

#### **Alternative B**

Under Alternative B, proposed management flexibility would allow for a maximum of discretionary actions while still providing resource protection. Alternative B would include at least a slight reduction in acreages of actions that pose potential impacts on cultural resources, such as areas open to ROW authorization, in RMAs, available for grazing, and open to OHV use. Recreational facilities could be allowed in accordance with RMA prescriptions. The acreage of ROW avoidance areas would be significantly increased under Alternative B, and proposed actions would be evaluated on a project-specific basis to ensure resource protection. No areas would be completely open to OHV use under Alternative B. The acreage of areas closed to OHV use would be increased from Alternative A. Under Alternative B, livestock grazing management, with greater restrictions on permits and range improvements, would cause less impacts than under Alternative A. Under Alternative B, impacts on cultural resources from grazing on BLM-managed allotments in Glen Canyon would be similar to Alternative A (see [Figure 2-23, Appendix A](#)).

Compared with Alternative A, Alternative B would expose fewer known cultural resources, both in total and for eligible resources, to potential adverse effects from management decisions, including open ROW authorizations, open OHV travel, RMAs, and grazing availability ([Table 3-38](#)).

Compared with Alternative A, Alternative B would reduce the acres of high-probability areas (according to the cultural resources predictive model) that would be open to potentially impactful management. This includes the fewer acres of high-probability areas open to ROW authorization, no acres of high-probability areas open to OHV travel, and a reduction of high-probability acreage in areas available to grazing, compared with Alternative A (see [Table 3-39](#)).

Compared with Alternative A, Alternative B would include a higher number of known and eligible cultural resources that would be protected from potential impacts by lands with wilderness characteristics management strategies and designations of **two** RNAs (ACECs) (**Table 3-40**). Other management actions under Alternative B that could protect cultural resources, such as areas closed to OHV use, ROW exclusion areas, and lands unavailable for livestock grazing, also would protect a **slightly** higher number of known and eligible sites, compared with Alternative A (see **Table 3-38**).

Compared with Alternative A, Alternative B would include more acreage of high-probability areas according to the cultural resources predictive model that would fall within lands with wilderness characteristics protection management and ACECs where use restrictions would offer increased protection to cultural resources (see **Table 3-41**). This includes the designation of Fiftymile Mountain RNA (ACEC) (see **Section 2.4.3**), a **54,800**-acre area specifically created to protect cultural resources and other scientific opportunities by prohibiting ROWs, limiting camping to permit only, and developing monitoring and management plans in coordination with grazing permittees.

### **Alternative C**

Under Alternative C, proposed management would use an area approach to allow for the accommodation of considered discretionary **actions** in appropriate settings while also protecting GSENM objects. Alternative C would include a reduction in acreages of actions that pose potential impacts on cultural resources, such as areas open to ROW authorizations, in RMAs, available for grazing, and open to OHV use compared with Alternative A. There would be a greater number of RMAs, though they would not cover all GSENM. Recreational facilities would be allowed in accordance with management areas; in general, they would have more of an impact in the front country area and be nonexistent in the primitive area. Under Alternative C, Fiftymile Mountain RNA (ACEC) would also be designated as under Alternative B.

The acreage of ROW exclusion areas would increase under Alternative C, compared with Alternatives A and B. Cultural resources would be protected from soil-disturbing activities that would be prohibited in the outback and primitive areas. No areas would be completely open to OHV use under Alternative C. The acreage of areas closed to OHV use would be increased compared with Alternatives A and B. Livestock grazing management would **the same** acres of **availability** and restrictions on permits and range improvements than under Alternative B.

Under Alternative C, impacts on cultural resources from grazing within BLM-managed allotments would be the same as under Alternative B. Alternative C would expose fewer known cultural resources, both in total and for eligible resources, to potential adverse effects from management decisions, including open ROW authorizations, open or limited OHV travel, and RMAs, compared with Alternatives A and B. The same number of sites under Alternative C would be exposed to grazing availability as under Alternative B (**Table 3-38**).

Alternative C would reduce the acres of high-probability areas (according to the cultural resources predictive model) that would be open to potentially impactful management, compared with Alternatives A and B. This includes the significantly fewer acres of high-probability areas open to ROW authorizations and in RMAs. Alternative C would include the same acres of high-probability areas open to OHV travel and available to grazing as Alternative B (see **Table 3-39**).

Compared with Alternatives A and B, Alternative C would include a higher number of known and eligible cultural resources that would be protected from potential impacts by lands with wilderness characteristics management strategies. The same number of sites would be included in RNAs (ACECs) as under Alternative B (**Table 3-40**). Other management actions under Alternative C that could protect cultural resources, such as areas closed to OHV use and ROW exclusion areas, also would protect a higher number of known and eligible sites, compared with Alternatives A and B (see **Table 3-38**).

Compared with Alternatives A and B, Alternative C would include more acreage of high-probability areas (according to the cultural resources predictive model) that would fall within lands with wilderness characteristics protection and minimization management strategies. However, compared with Alternative B, slightly less high-probability acreage would be within RNAs (ACECs), where use restrictions would offer increased protection to cultural resources (see **Table 3-41**).

#### **Alternative D**

Under Alternative D, proposed management would maximize natural processes and resource protection by limiting discretionary actions. Alternative D would include the least acreages of actions that pose potential impacts on cultural resources, such as areas open to ROW authorization, in RMAs, available for grazing, and open to OHV use, compared with Alternatives A, B, and C. Alternative D would have the fewest number of RMAs, and they would cover the least number of acres. Recreational facilities would be prohibited outside RMAs. Under Alternative D, the least acreage would be available for new ROWs to be authorized, no areas would be completely open to OHV use, and the greatest acreage would be closed to OHV use. Also under Alternative D, vegetation management would prioritize natural processes, and livestock grazing management would include the greatest restrictions on permits and range improvements.

Alternative D would affect the fewest known cultural resources, both in total and for eligible resources, from management decisions, including open ROW authorizations, open or limited OHV travel, RMAs, and grazing availability, compared with Alternatives A, B, and C (**Table 3-38**).

Alternative D would include the fewest acres of high-probability areas (according to the cultural resources predictive model) that would be open to potentially impactful management, compared with Alternatives A, B, and C. This includes the significantly fewer acres of high-probability areas open to ROW authorizations and in RMAs. Alternative D would include the least acres of high-probability areas for OHV travel and the least available to grazing (see **Table 3-39**).

Alternative D also would offer the most management actions that could protect cultural resources. While there would be no new ACECs or RNAs (ACECs) under Alternative D, Alternative D would include the highest number of acres of lands with wilderness characteristics that would be managed to protect their characteristics. Alternative D also would include a plan element to employ the cultural resources predictive model to exclude ROW authorizations in high-probability areas. The BLM would not include this element under Alternative A, and the BLM would manage ROWs by avoidance in those areas under Alternatives B and C.

Alternative D would include the highest number of known and eligible cultural resources that would be protected from potential impacts by lands with wilderness characteristics management strategies, compared with Alternatives A, B, and C. Other management actions under Alternative D that could protect cultural resources, such as areas closed to OHV use, ROW exclusion areas, and lands unavailable

for livestock grazing, also would protect the highest number of known and eligible sites, compared with Alternatives A, B, and C (see **Table 3-38**).

Alternative D would include the least amount of high-probability acreage within ACECs and RNAs (ACECs), where use restrictions would offer increased protection to cultural resources, compared with Alternatives B and C (see **Table 3-41**). However, other provisions of Alternative D would include significantly greater acreages of high-probability areas that would be protected by limiting ground-disturbing activities under VRM classifications, LWC management strategies, grazing unavailability, ROW exclusion, and OHV closures.

### **Alternative E**

The management directions for cultural resources as included in the Proposed RMP, Alternative E, and their potential impacts on cultural resource are compared with the other action alternatives in the above section *Impacts Common to the Action Alternatives (B, C, D, and E)*. Broadly speaking, much of Alternative E management direction for other resources is also similar to Alternative C, and impacts to cultural resources are expected to be similar to those under Alternative C.

Like Alternative C, Alternative E would use an area approach to allow for the accommodation of considered discretionary actions in appropriate settings while also protecting GSENM objects. The areas of greatest difference between Alternatives C and E include relatively slight decreases in ROW exclusion and available acres for livestock grazing. As seen in **Table 3-38** and **Table 3-39**, the numbers of eligible sites exposed to grazing availability are only slightly higher under Alternative E than Alternative C; however, there is a greater number of acres of high-potential cultural resource areas made unavailable under Alternative E than Alternative C. Overall, Alternative E would have impacts on cultural resources that are similar, if not identical, to those under Alternative C.

### **Cumulative Impacts**

The BLM-managed, Forest Service-managed, NPS-managed, and adjacent state, tribal, county, and privately owned land surrounding GSENM are the cumulative effects analysis area for cultural resources. Ongoing and planned actions in and near GSENM would influence cultural resource management on a regional scale. The time frame for cumulative environmental consequences for future actions is the life of the RMP.

The cumulative impacts of past and present actions on cultural resources in the planning area are captured in the description of the *Trends and Forecast* sections of the *Affected Environment* (**Section 3.6.1**). Primarily, these actions include unauthorized collection of artifacts and historic objects, increased visitation and recreation, and grazing. In particular, increased OHV use has the potential to be impactful given the ease of access and increasing visitation to GSENM.

Reasonably foreseeable future actions for the KFO, including the East Zion Initiative, Shinarump Mountain Bike Trail and Trailhead Development, and Paunsaugunt Travel Management Plan projects, have the potential to disperse visitors out of GSENM. Ongoing recreation projects within GSENM include the Calf Creek Recreation Site Deferred Maintenance and Improvements Project, where adverse effects on two archaeological sites will be mitigated by a recently signed memorandum of agreement.

Wildfire and other natural forces resulting from climate change will continue to stress resources in GSENM. The reasonably foreseeable future actions in GSENM that have the potential to increase the

potential for human-caused fire ignitions include increased visitation and recreation and ROW development projects, including the [Garkane ROWs \(Cottonwood/Cockscomb; Buckskin to Kanab, Utah and Fredonia; Buckskin to Page\)](#), the [Arcadin ROW](#), the [Navajo-McCullough Powerline ROW](#) and [Lake Powell Pipeline ROW](#).

Current cultural resource management practices at GSENM, such as site monitoring and co-stewardship programs, public education and law enforcement, and lessening grazing pressures, appear to have resulted in the stabilization of current conditions of cultural resources in GSENM. These and other reasonably foreseeable future projects that would be considered federal undertakings under the National Historic Preservation Act will be subject to Section 106 compliance that should avoid, minimize, or mitigate any potential adverse effects on cultural resources. However, no cultural resource compliance effort can completely remove the possibility of adverse effects, as even the most intensive survey efforts cannot guarantee the identification of all cultural resources in a given area.

Compared with Alternative A, Alternatives B, C, D and E would reduce the potential risk for impacts on cultural resources to cumulatively reach significant levels through the exclusion or restriction of discretionary [actions](#). Of Alternatives B, C, and D, Alternative D would offer the highest degree of protection for cultural resources. [Alternative E would have cumulative impacts similar to those under Alternative C.](#)

### **3.7 TRIBAL INTERESTS**

#### **3.7.1 Affected Environment**

The planning area has been occupied by Native American communities since time immemorial. [This section and Appendix I.7 discuss tribes that have occupied and used lands within the planning area, traditional and present tribal uses of the region, resources associated with those uses, and the trends of current impacts on tribal interests in the planning area \(Table 3-42\).](#) Tribal communities in the planning area include the Hopi Tribe of Arizona, Kaibab Band of Paiute Indians, Navajo Nation, Paiute Indian Tribe of Utah (includes Shivwits Band of Paiute Indians, Indian Peaks Band of Paiute Indians, Kanosh Band of Paiute Indians, Cedar Band of Paiute Indians, and Koosharem Band of Paiute Indians), Pueblo of Acoma, Pueblo of San Felipe, Pueblo of Tesuque, San Juan Southern Paiute Tribe of Arizona, Ute Mountain Ute Tribe, Ute Indian Tribe of the Uintah and Ouray Reservation, and Zuni Tribe of the Zuni Reservation. In addition to these tribes, the BLM is coordinating with the All Pueblo Council of Governors, which includes the pueblos noted above as well as the pueblos of Cochiti, Isleta, Jemez, Laguna, Nambe, Ohkay Owingeh, Picuris, Pojoaque, San Ildefonso, Sandia, Santa Ana, Santa Clara, San Domingo, Taos, and Ysleta del Sur.

Native American peoples make up a substantial portion of the region's population (see [Section 3.22, Environmental Justice](#)). There are many locations and traditional uses within the decision area that contribute to the lives of individual [tribal members](#), including ritual, spiritual, and economic contributions (see [Section 3.21, Social and Economic Values](#)). [Through continued engagement with tribes and the solicitation and incorporation of indigenous knowledge in decision-making, the BLM will ensure the traditional use locations and resources maintain their importance for tribal members.](#)

**Table 3-42. Current Management and Activities that Could Impact Locations and Resources Important to Tribes**

| <b>Resource/Use</b>   | <b>Current Status</b> |
|---|-----------------------|
| <b><i>Travel and Transportation (Acres)</i></b>             |                       |
| Closed to OHV use   | 1,500                 |
| OHV travel limited to designated routes                     | 1,864,000             |
| Open OHV use  | 100                   |
| <b><i>RMAs (Acres)</i></b>                                  |                       |
| ERMAs   | 1,797,700             |
| SRMAs   | 67,600                |
| RMZs (SRMA and ERMA)  | 17,400                |
| Total   | 1,865,300             |
| <b><i>Livestock Grazing (Acres)</i></b>                     |                       |
| Available   | 2,117,300             |
| Unavailable   | 139,300               |
| <b><i>Lands and Realty (Acres)</i></b>                      |                       |
| ROW exclusion   | 881,300               |
| ROW avoidance   | 332,800               |
| Open to ROW authorization                                   | 630,400               |
| ROW seasonal avoidance area                                 | 21,100                |
| Designated corridors  | 10,900                |
| <b><i>Lands with Wilderness Characteristics (Acres)</i></b> |                       |
| Strategy 3 (no protection)                                  | 559,600               |
| <b><i>ACECs and RNAs (ACECs)</i></b>                        |                       |
| Total acreage of all areas designated                       | 1,500                 |
| <b><i>WSAs</i></b>  |                       |
| Total acres   | 881,100               |

The BLM maintains a relationship with the tribes that used, and continue to use, the planning area for important cultural activities. The BLM has the responsibility to conduct government-to-government consultations with [Tribal Nations](#). This includes ensuring the responsibilities outlined in Joint Secretarial Order 3403, Fulfilling the Trust Responsibility to Indian tribes in the Stewardship of Federal Lands and Waters, and the subsequent BLM Instruction Memorandum 2022-11, which provides direction for implementing provisions of Joint Secretarial Order 3403 in relation to co-stewardship with federally recognized Indian and Alaska Native tribes. Co-stewardship could include, among other things, sharing of technical expertise; combining tribal and BLM capabilities to improve resource management and to advance the responsibilities and interests of each; and making [indigenous](#) knowledge, experience, and [tribal](#) perspectives integral to the public's experience of federal lands. Providing opportunities for co-stewardship with interested Tribal Nations is a critical component of this planning effort.



### 3.7.2 Environmental Consequences

Refer to **Section F.12**, Tribal Interests, in **Appendix F**, Analytical Framework, for descriptions of the indicators, analysis areas, and assumptions used for the following analysis.

#### **Issues**

- How would proposed management ensure continued traditional uses of religious or cultural resource sites important to Tribal Nations and local communities?
- How would proposed management impact landscapes of religious or cultural importance to Tribal Nations and local communities?

#### **Impacts Common to All Alternatives**

The alternatives are programmatic in nature and do not indicate specific project-level impacts; these would be addressed, and if necessary mitigated, at the project level. The main pathway for addressing and mitigating impacts on tribal interests is through coordination and consultation with federally recognized tribes that maintain ties to GSENM. Management actions that have the potential to impact tribal interests vary among the alternatives; however, government-to-government coordination and consultation would continue under all alternatives and would contribute to avoidance or minimization of potential impacts.

Impacts on tribal interests from unauthorized activities would also occur under all alternatives, such as unintentional human-caused wildfires or vandalism; however, some management actions have the potential to influence the degree to which unauthorized activities occur.

Travel management decisions, such as road, trail, and OHV use [area](#) designations, would continue to be considered under all alternatives. These decisions could affect the quantity of visitors to different areas in GSENM and how they are able to reach different locations. While restrictions to travel within GSENM may be protective of some resources or areas of interest to tribes, they would also restrict the ability of tribal members to access resources or areas of interest to tribes.

Recreation and visitation are likely to increase regardless of which alternative is chosen. Thus, the potential impacts from increases in user encounters and disruption of the characteristics of the setting that make certain tribal locations and resources important. The disruption could include increased damage to cultural landscapes and cultural resources, visual changes from social trails and trash, and an increased presence of people and noise.

The BLM would allow grazing under all alternatives with similar impacts expected where grazing is available, though the amount and location of available allotments varies by alternative, as discussed below. Potential impacts on tribal locations and uses from grazing include ground disturbance and visual changes from allotment improvements, as well as potential ground disturbance and vegetation changes from the presence of cattle. Grazing and its associated activities can increase the potential for the spread of invasive species, which may impact traditional areas of plant gathering or hunting. Additionally, livestock can cause ground disturbance, particularly near water sources and archaeological sites that might be important to tribes, resulting in changes to the setting of important places and resources.

The BLM would continue to allow ROWs, although the locations where they would be allowed varies by alternative. ROWs can impact resources or areas of interest to tribes, including both landscape features, views, and disruptions in activities. Impacts may be greater in the short term due to the increased presence

of equipment and personnel related to construction activities. Long-term impacts include changes in views, noise, and ground disturbance within important areas. The magnitude of these impacts would all vary based on the nature of proposed development.

The potential for wildfires would continue under all alternatives. Wildfires impact resources important to tribes in the long term by directly damaging locations and landscapes; this could potentially change tribal use of an area if specific plant species are lost or certain areas are disturbed. Additionally, the loss of vegetation cover increases the potential for erosion and related impacts on locations of importance to tribes, such as cultural resources. Tribal access to burned areas may be restricted in the short term following a wildfire due to safety concerns or damage to infrastructure, such as roads. However, all alternatives include fire and fuels management that reduces the likelihood of uncharacteristically severe wildfire. This management would protect tribal interests by preserving the appearance of landscapes and preventing uncharacteristically severe damage to any resources of interest to tribes present in the affected areas. Under all alternatives, efforts would be made to restore landscapes after wildland fire and maintain and restore ecosystems, including allowing fire to function in its natural ecological role, when possible.

Vegetation management would occur under all alternatives. These treatments could result in short-term disruption to tribal access to the area and potentially, the availability of resources (such as plants or animals). However, in the long term, these treatments should increase the availability of those resources and potentially improve locations and resources, depending on the nature of their importance (such as efforts to improve or protect riparian areas and springs).

Special designations, such as lands with wilderness characteristics and WSAs, or the management of specific areas as ACECs or RNAs (ACECs), have the potential to result in preservation and protection of locations and resources important to tribes. While the acreages of some designations vary by alternative, the general protections are largely the same. The WSAs would remain a total of 881,100 acres across 16 areas, with identical acreages and locations across all alternatives. Special designations are largely anticipated to be generally protective of resources and areas of interest to tribes, such as landscapes, vegetation communities, and cultural resources, by limiting ground disturbance and changes in the visual or auditory setting due to reduced motorized uses and restrictions on development.

Under all alternatives, the general and resource-specific conservation measures described in **Appendix C, Best Management Practices**, would offer protection to resources and areas of interest to tribes. This is because these measures offer mechanisms such as BMPs (see **Appendix C**) regarding reduction of visual impacts from development or protection of water quality.

### **Alternative A**

Under Alternative A, the potential impacts on locations and resources of tribal interest are anticipated to continue as described in the *Trends and Impacts Common to All Alternatives*. The BLM would continue to consult with tribes; however, under Alternative A there is no formal management direction related to tribal co-stewardship. The BLM would continue to seek these opportunities and collaboration on tribal co-stewardship per direction in BLM Instruction Memorandum 2022-11 and Joint Secretarial Order 3403 regarding co-stewardship with federally recognized Indian and Alaska Native tribes.

Under Alternative A, access to GSENM is facilitated by an existing road system, with vehicle and OHV travel restricted to designated routes for the vast majority of GSENM (see **Table 3-42**); therefore, while

it is possible to access areas along designated routes, off-road use is not allowed. This allows tribal members access to areas while making it possible to find quiet and solitude away from these routes without unexpected interruptions from vehicles. There is the potential for user encounters along access routes, particularly where those routes access areas that are popular for both tribal and general visitation.

Recreation is likely to continue increasing throughout GSENM, with impacts similar to those described in *Impacts Common to All Alternatives*. There is the potential for encounters between tribal members and other recreational users throughout much of GSENM. These encounters are most likely to occur where uses are concentrated, such as in RMAs designated as SRMAs, which emphasize specific recreation opportunities (see **Table 3-42**). Currently, the majority of RMAs at GSENM are considered ERMAs, which emphasize management for the benefit of multiple recreational uses but may not take into account tribal uses and concerns.

Under Alternative A, 2,117,300 acres would be available for livestock grazing in the livestock planning area that includes Glen Canyon. In the decisions area, 1,817,800 acres would be available for grazing under Alternative A, and 47,800 acres would be unavailable for grazing. The impacts noted in *Impacts Common to All Alternatives* could occur throughout this area. Given the extent of areas available for grazing under this alternative, there is an increased likelihood that grazing would impact locations and resources important to tribes. Additionally, there could be incompatibility between grazing and its associated activities and tribal uses, such as increased presence of cattle and people.

Approximately 630,400 acres would be open to ROW authorizations under Alternative A. While the exact impacts on tribal locations and uses would be determined on a project-by-project basis, the potential impacts are expected to be similar to those described in *Impacts Common to All Alternatives*. These impacts would be avoided on the 881,300 acres of ROW exclusion areas and minimized on the 332,800 acres of ROW avoidance areas (see **Table 3-42**).

Under Alternative A, the BLM would continue to manage vegetation and water resources as described in **Section 3.3**, Vegetation, and **Section 3.4**, Water Resources. A full range of vegetation management methods would be available for consideration, and vegetation management would be prioritized in areas where removal of woodland products would improve rangeland health, wildlife habitat, and forage. Impacts are anticipated to be the same as described under *Impacts Common to All Alternatives*. The BLM would allow surface-disturbing research in reference plant communities (referred to as “relict” under Alternative A management) if it is designed to promote the overall health and understanding of these areas. This would increase the potential for impacts on plant communities that are of interest to tribes.

Water developments and maintenance would be allowed for visitor- and recreation-related uses in high-use remote areas, and to improve livestock and wildlife distribution. Since water and its associated resources, such as plant communities, are of particular interest to tribes, water source development activities increase the potential for impacts on resources that are of interest to tribes. Maintenance of existing water developments would be allowed if it would not affect reference plant communities and hanging gardens. This management direction would reduce the potential for impacts on plant communities that are of interest to tribes.

Areas with special designations and management areas would continue as summarized in **Table 3-42**. These areas would continue to provide some protections and preservation of tribally important locations and resources.

**Impacts Common to Action Alternatives B, C, D, and E**

Alternatives B, C, D, and E include a formal objective related to ensuring continued tribal stewardship with the goal of honoring Tribal Nations' stewardship, interests, and uses through the inclusion of objectives and management directions concerning tribal co-stewardship that are identical. While much of the management direction and objectives align with current practices, under Alternatives B, C, D, and E this guidance is more explicit in directing how to protect tribal interests and foster tribal involvement in the land use planning process. Following the approval of this Proposed RMP/Final EIS, the BLM would develop an implementation-level Tribal Nation co-stewardship plan. Increased tribal involvement in the land use planning process from development and implementation of a co-stewardship plan would result in reduced frequency and severity of impacts on tribal interests compared with the existing management under Alternative A.

The collection of GSENM objects and/or resources would be prohibited under Alternatives B, C, D, and E with some exceptions, including providing for collection and traditional uses by Tribal Nations where consistent with federal and state law. This would increase protections afforded to resources important to tribes, such as plants and minerals, while continuing to provide tribal access to these resources.

Alternatives B, C, D, and E emphasize landscape-scale ecosystem restoration projects to restore functional vegetation communities. This would have long-term, beneficial impacts on locations and resources of interest to tribes by focusing on the larger ecosystem, which is in line with tribal perspectives on the interrelatedness of resources, and by reducing the likelihood of uncharacteristically severe wildfire at the landscape scale. Alternatives B, C, D, and E also encourage the use of prescribed fire across GSENM, except where fire suppression would protect high-priority values, such as life, or wildland fire would be otherwise inconsistent with the protection of GSENM objects. While these management activities are anticipated to have long-term benefits to natural resources, including those important to tribes, they could also create short-term impacts in the form of visual setting changes and restrictions to access while the BLM carries out these activities.

Under Alternatives B, C, D, and E discretionary actions within riparian communities associated with hanging gardens would be prohibited, except for actions that protect the hanging gardens. This is an important protection of a resource that multiple tribes have noted as particularly important to tribal uses and practices.

Alternatives B, C, D, and E include direction to mitigate impacts on water quality from discretionary actions through minimization and avoidance. Direction also exists to minimize the quantity of water used by discretionary actions and to prohibit new water developments in natural plant communities that lack invasive species. This would facilitate protection of water resources, which have been noted by multiple tribes as important locations and resources. This would also protect native plant communities and plants that are gathered by tribal communities.

Under Alternatives B, C, D, and E management of lands with wilderness characteristics with the priority of protecting those wilderness characteristics, such as the appearance of naturalness and outstanding opportunities for solitude, also would offer protection to tribal interests by helping to preserve the natural appearance of landscapes and reducing potential interruptions to tribal use. The acres allotted for the different management strategies differ under each alternative and are discussed by alternative below.

Alternatives B, C, and D offer some degree of greater protection to tribal interests through management of lands with wilderness characteristics than under Alternative A.

Under Alternatives B, C, D, and E promotion of science and research are prioritized as fundamental to management of GSENM; this is similar to under Alternative A. However, unlike under Alternative A, management direction exists to develop and maintain a GSENM science plan informed by Indigenous knowledge. Compared with Alternative A, Alternatives B, C, D, and E would result in fewer potential impacts on tribal interests from the pursuit of scientific research at GSENM.

#### **Alternative B**

Under Alternative B, travel management designations would change; the BLM would close 952,000 acres to OHV use, and 913,600 acres would have OHV travel limited to designated routes. The decrease in areas open to OHV use compared with Alternative A would offer greater protection to resources or areas of interest to tribes, particularly from user encounters or other impacts associated with vehicle use, such as increased erosion. This closure could also restrict the ability of tribal members to access these important locations and resources. Despite this, these closures and limitations on travel would increase opportunities to find quiet and solitude away from these routes without unexpected interruptions from vehicles and visitors.

Under Alternative B, impacts associated with recreation would be similar in nature to those described under *Impacts Common to All Alternatives*. Under Alternative B, approximately half of RMAs at GSENM would be considered ERMAs (1,770,100 acres, which is 27,600 acres less than under Alternative A). ERMAs emphasize management for the benefit of multiple recreational uses. While these areas do not necessarily take into account tribal uses and concerns, recreation is somewhat dispersed, which minimizes the potential for some impacts such as encounters between recreationalists and tribal members. Additionally, 95,300 acres would be designated as SRMAs (an increase of 27,700 acres from Alternative A). This difference in areas designated as RMAs compared with Alternative A is modest, but could result in reduced impacts such as encounters between tribal members and recreationists where their uses overlap. Recreation-related impacts on tribal interests under Alternative B would be similar, though likely slightly more in magnitude, to those described under Alternative A. Tribal consultation would be essential to understanding the potential and extent of impacts from SRMA designations on tribal use.

Impacts related to livestock grazing would be similar in nature to those described under Alternative A and as detailed in *Impacts Common to All Alternatives*. Under Alternative B, 2,042,100 acres would be available for livestock grazing in the planning area (a 4 percent reduction from Alternative A), which could result in a slight decrease in impacts from Alternative A. In the decision area 1,742,600 acres would be available for livestock grazing under Alternative B, compared to 1,817,800 acres in the decision area under Alternative A. However, the locations of grazing in relationship to locations and resources of tribal importance are not specifically known.

Under Alternative B, 85,100 acres would be open to ROW authorizations; this is an 87 percent reduction from Alternative A. While the exact impacts on tribal locations and uses would be determined on a project-by-project basis, the potential impacts within the areas open to ROWs are expected to be similar to those described in *Impacts Common to All Alternatives*. However, the potential for impacts would be reduced due to the limited area available for ROWs. Potential impacts would be avoided on the 945,700 acres of ROW exclusion areas and minimized on the 821,500 acres of ROW avoidance areas. Under

Alternative B, new water developments and maintenance of existing developments would be allowed if they contribute to the protection and restoration of GSENM objects, or increase the resiliency of GSENM objects. Compared with Alternative A, this would allow fewer potential impacts on water resources and plant communities of interest to tribes. Additionally, maintenance of existing water developments in natural plant communities that lack invasive species would be allowed in a manner that minimizes impacts on natural plant communities and best conserves multiple resources. Compared with Alternative A, this could result in more impacts on natural plant communities of interest to tribes.

Under Alternative B, impacts related to management of lands with wilderness characteristics would be the same as those described under *Impacts Common to All Alternatives*; the BLM would manage 487,600 acres (87.1 percent) of land with wilderness characteristics under Strategy 3 (no protections) and 72,000 acres (22.9 percent) of land with wilderness characteristics under Strategy 1 (protection). Compared with Alternative A, this would afford more protection to the wilderness characteristics of these lands and by extension to tribal interests. Additional protection of locations and resources important to tribes would occur with the designation of ERNAs (ACECs), such as the 54,800-acre Fiftymile Mountain RNA (ACEC), created specifically for the protection of cultural resources (see **Section 2.4.3** and **Section 3.6**). Under Alternative B, a total of 56,300 acres of ACECs and RNAs (ACECs) would be designated; this is an increase of 54,800 acres over Alternative A.

### **Alternative C**

Under Alternative C, travel management designations would change; the BLM would close 1,209,500 acres to OHV use, and 656,100 acres would limit OHV travel to designated routes (a 36 percent reduction from Alternative A). The decrease in areas open to OHV use from Alternative A would offer greater protection to resources or areas of interest to tribes, particularly from user encounters or other impacts associated with vehicle use, such as increased erosion. However, similar to Alternative B, this closure could also restrict the ability of tribal members to access these important locations and resources.

Under Alternative C, impacts associated with recreation would be similar in nature to those described under *Impacts Common to All Alternatives*. The majority of RMAs at GSENM would be considered ERMAs (486,300 acres, which is 1,311,400 acres less than under Alternative A). ERMAs emphasize management for the benefit of multiple recreational uses. Additionally, 417,400 acres would be designated as SRMAs (an increase of 349,800 acres from Alternative A). This overall decrease in areas designated as RMAs could result in decreased impacts, such as encounters between tribal members and recreationists where their uses overlap. Tribal consultation would be essential to understanding the potential and extent of impacts from RMA designations on tribal use.

Impacts related to livestock grazing would be similar in nature to those described under Alternative B and as detailed in *Impacts Common to All Alternatives*. Under Alternative C, the allotments in the livestock grazing planning and decision areas would be allocated the same as under Alternative B, which could result in a slight decrease in impacts from Alternative A. However, the locations of grazing in relationship to locations and resources of tribal importance are not specifically known.

Under Alternative C, 10,900 acres would be open to ROW authorizations; this is a 98 percent reduction from Alternative A. While the exact impacts on tribal locations and uses would be determined on a project-by-project basis, the potential impacts within the areas open to ROWs are expected to be similar to those described in *Impacts Common to All Alternatives*. Potential impacts would be avoided on an

additional 1,163,500 acres of ROW exclusion areas and minimized on the 671,700 acres of ROW avoidance areas.

Under Alternative C, the landscape-scale ecological restoration projects described under *Impacts Common to Alternatives B, C, D, and E* would be influenced by an area approach to vegetation management, where the front country, passage, and outback areas would focus on proactive management, while the primitive area would prioritize the use of natural techniques and processes over other methods. While prioritizing natural processes and techniques over other methods in the primitive area may limit the amount of short-term impacts on areas of tribal interest such as ground disturbance, the more proactive approach in the front country, passage, and outback areas would result in an increased pace of restoration activities.

Under Alternative C, management related to new water developments and maintenance of existing developments, and their associated impacts on areas of tribal interest, are identical to that under Alternative B.

Under Alternative C, impacts on tribal interests related to management of lands with wilderness characteristics would be the same as those described under *Impacts Common to All Alternatives*. However, the potential for impacts would be minimized on the 240,600 acres managed under Strategy I (protection); this would be an increase over Alternative A, which includes no acres under Strategy I. Additional protection of locations and resources important to tribes would occur with the designation of 56,300 acres of ACECs, 54,800 acres of which are in the Fiftymile area, created for the protection of cultural resources (see **Section 2.4.3** and **Section 3.6**). This is an increase of 54,800 acres over Alternative A.

#### **Alternative D**

Under Alternative D, travel management designations would change; the BLM would close 1,438,000 acres to OHV use, and 427,600 acres would limit OHV travel to designated routes (a 57 percent reduction from Alternative A). The decrease in areas open to OHV use from Alternative A would offer protection to resources or areas of interest to tribes and minimize the potential for user encounters or other impacts associated with vehicle use, such as increased erosion. However, this alternative has the greatest potential to impact tribal access due to the reduction in areas available for travel.

Between Alternatives B, C, and D, Alternative D would designate the fewest acres as ERMA (311,900 acres) and SRMA (100,300 acres). This overall reduction in emphasis on recreation would potentially minimize user overlap between tribal members and recreationalists and potential impacts on locations and resources of tribal use. However, since recreational use is anticipated to increase, users would become more concentrated in these RMAs. This concentration of use could result in more impacts on locations and resources important to tribes if there is overlap between these areas and RMA designations. Consultation would be critical to understanding and minimizing these impacts.

Impacts related to livestock grazing would be similar in nature to those described under Alternative A and as detailed in *Impacts Common to All Alternatives*; however, Alternative D would result in the greatest reduction of acres available compared with Alternative A. Specifically, Alternative D would have 918,300 acres available (a 57 percent reduction from Alternative A) in the planning area that includes Glen Canyon. In the decision area, 686,300 acres would be available for livestock grazing under Alternative D, compared to 1,817,800 acres in the decision area under Alternative A. This could result in a greater decrease in

impacts compared with Alternative A, although the locations of grazing in relationship to locations and resources of tribal importance are not specifically known.

Under Alternative D, 2,300 acres would be open to ROW authorizations; this is an almost 100 percent reduction from Alternative A. Another 1,608,800 acres would be designated as ROW exclusion and 235,000 acres as ROW avoidance. This reduction in area would result in the greatest protection and preservation of locations and resources of tribal interest compared with Alternative A; however, the exact impacts on tribal locations and uses would be determined on a project-by-project basis.

Under Alternative D, the landscape-scale ecosystem restoration projects described under *Impacts Common to Alternatives B, C, D, and E* would focus specifically on restoring native, functional vegetation communities and would prioritize natural processes and techniques over other methods. Compared with Alternative A, this would reduce short-term direct impacts, such as ground disturbance and visual or auditory intrusions, on resources and landscapes of interest to tribes from restoration activities. While prioritizing natural processes and techniques over other methods may limit the amount of short-term impacts, it could also limit the pace and scale of restoration activities because of the techniques not prioritized, such as mechanical pretreatments for prescribed burns, negatively impacting many of the natural resources of interest to tribes such as water sources, wildlife, and vegetation communities in the long term.

Wildland fire management would be similar to that described under *Impacts Common to Alternatives B, C, D, and E* except that additional management directions exist that prioritize natural stabilization, rehabilitation, and restoration processes and techniques over other methods. Compared with Alternative A, this focus on natural processes and techniques would reduce short-term impacts on resources and landscapes of interest to tribes by limiting impacts associated with nonnatural techniques, such as ground disturbance and visual or auditory intrusions. While prioritizing natural processes and techniques over other methods may limit the amount of short-term impacts, it would also limit the pace and scale of restoration activities because of the techniques not prioritized, such as mechanical pretreatments for prescribed burns, negatively impacting many of the natural resources of interest to tribes such as water sources, wildlife, and vegetation communities in the long term.

Under Alternative D, new water developments would be prohibited unless the primary purpose of the water development is to protect or restore the resiliency of GSENM objects. Additionally, management direction would both prohibit new water developments in natural plant communities that lack invasive species (as under Alternatives B and C) and remove existing water development in these areas, unless it would further harm resources. Compared with Alternative A, these actions would protect these important tribal resources and result in fewer potential impacts on water resources and plant communities of interest to tribes.

Under Alternative D, potential impacts on locations and resources important to tribes would be minimized on the 559,600 acres of lands with wilderness characteristics managed under Strategy I (protection); this is an increase over Alternatives A, B, and C. However, only 1,500 acres of ERNAs (ACECs) would be considered under this alternative; this is the same as under Alternative A. Overall, the protections achieved through designating 559,600 acres of lands with wilderness characteristics under Strategy I would encompass areas of importance and, therefore, increase protection for tribal resources compared with Alternative A.



Alternative D has the most potential to protect and preserve locations and resources important to tribes due to reduced area designations related to vehicle use, recreation, grazing, and ROW development, and increased area designations related to lands with wilderness characteristics. However, ACEC designations under Alternative D would be the same as under Alternative A and would provide the smallest amount of protection to natural resources from these designations among the alternatives. Alternative D would reduce the potential for impacts on tribal interests through vegetation management activities intended to support landscape-scale restoration and ecological resilience compared with Alternative A. However, the lack of management direction specifying proactive vegetation management (as seen under Alternatives B and C), and the prioritization of natural methods present only under Alternative D, would likely reduce the number of restoration projects that use active management methods. While this could limit the amount of short-term impacts on tribal interests such as ground disturbance and visual or auditory intrusions, it would also limit the pace and scale of restoration activities by limiting the techniques available for use (see **Section 3.3**, Vegetation, and **Section 3.13**, Fire and Fuels Management). This would impact many of the natural resources of interest to tribes such as water sources, wildlife, and vegetation communities in the long term.

#### **Alternative E**

The management directions for tribal stewardship and their potential impacts as included in the Proposed RMP/Final EIS, Alternative E, would be broadly similar to Alternatives B, C, and D. Under Alternative E, however, management direction was rewritten with an emphasis on tribal collaboration, including collaboration in identifying science needs and working with Indigenous knowledge. New management direction was added to guide the process for soliciting and incorporating Indigenous knowledge into plan implementation. Tribal access to cultural resources, sacred sites, and traditional cultural landscapes was also clarified in Alternative E. Management direction under Alternative E in other resource areas is also similar to Alternative C, and impacts on tribal interests are expected to be similar to those under Alternative C.

Like Alternative C, Alternative E would use an area approach to allow for the accommodation of considered discretionary actions in appropriate settings while also protecting GSENM objects. The areas of greatest difference between Alternatives C and E include relatively slight decreases in ROW exclusion and available acres for livestock grazing under Alternative E. Under Alternative E, 1,737,300 acres would be available for livestock grazing in the decision area, compared to 1,742,600 acres in the decision area under Alternative C and 1,817,800 acres in the decision area under Alternative A. see **Table 2-1**). Overall, Alternative E would have impacts on tribal interests that are similar, if not identical, to those under Alternative C.

#### **Cumulative Effects**

Cumulative effects evaluate the potential impacts on areas and resources of tribal importance from the alternatives when combined with past, present, and reasonably foreseeable actions. For tribal interests, the geographic scope for the cumulative effects analysis (the cumulative effects study area) includes all lands within GSENM and the adjacent surrounding area, regardless of ownership. The temporal bound is the life of the RMP.

Increasing human population around GSENM's boundaries contributes to increased visitation and use within the cumulative effects study area, and greater chances for unintentional disturbance, vandalism, and looting. Tourism campaigns in recent years, such as those by the Utah Office of Tourism, have highlighted

the surrounding national parks and outdoor recreation in and around GSENM accessible from towns in southern Utah such as Kanab and Escalante. These campaigns could exacerbate potential impacts on areas of tribal importance and affect access and traditional use of those areas by tribes. The effects of climate change leading to a warmer, drier climate can influence natural disturbances to areas of tribal importance. This is primarily through increased wildfire conditions and erosion as a shift to less snow and more rain and more intense rainstorms lead to greater frequencies of runoff and erosional processes. These changes in climate will influence the rate at which natural processes impact areas of tribal importance, potentially affecting access and traditional use of those areas by tribes.

Compared with Alternative A, Alternatives B, C, D, and E would reduce the potential for impacts on tribal interests through the exclusion or restriction of discretionary actions, such as limiting areas available for camping or OHV use. Of the alternatives, Alternative D would offer the most protection to tribal interests through restriction of discretionary actions, although acres of ACEC designations under Alternatives A and D are the smallest among the alternatives.

Compared with Alternative A, Alternatives B, C, D, and E would reduce the potential for impacts on tribal interests through vegetation management activities intended to support landscape-scale restoration and ecological resilience. Alternative B would offer the most protection to tribal interests through active vegetation management, reducing the risk of uncharacteristically severe fires.

### **3.8 PALEONTOLOGICAL AND GEOLOGICAL RESOURCES**

The decision area is near the western margin of the Colorado Plateau physiographic province. It comprises a series of plateaus, buttes, and mesas that reflect the type and structure of the underlying geological strata (**Figure 3-23, Appendix A**). The Colorado Plateau is characterized by relatively flat-lying strata that have been locally offset and folded during vertical movements between north- and south-oriented blocks in the earth's crust. This uplift and folding have created the spectacular scenery for which the area is known worldwide. The diverse geological features include a sequence of sedimentary rock layers exposed in the western part of GSENM, known as "the Grand Staircase," which contributes to the GSENM name. To the east are the Kaiparowits Plateau, Escalante Canyons, and the Circle Cliffs Uplift adjacent to the famous Waterpocket Fold (Capitol Reef National Park).

The planning area includes bedrock geological formations ranging in age from the Permian period to the Late Cretaceous (265–73 million years ago), and unconsolidated Neogene deposits probably dating back to at least the early Pleistocene. Fossils occur in all bedrock formations and in the Neogene units in the planning area. Permian through Jurassic units yield fossil fauna and flora that can largely be viewed over wide areas of the Colorado Plateau.

GSENM's bedrock geological units record the earth's surface conditions during the end of the Permian to the end of the Cretaceous (almost the entire Mesozoic era), as well as the postdepositional effects of the Laramide Orogeny and uplift of the Colorado Plateau, overprinted with Neogene erosional features. Given its proximity to the western portion of the Cordilleran foreland basin, the stratigraphic record is especially complete and of interest to researchers studying end-Permian and Mesozoic climate, isotopic records, tectonics, stratigraphy, rock-forming processes, sedimentation patterns, and numerous other topics. Examples of groundbreaking geological research in GSENM include insights into Martian iron concretion formation (known as "blueberries"), the living biofilms that inhabit rocks, and the effects of massive submarine volcanic eruptions on the shallow marine ecology and stratigraphy. Approximately one-quarter

of all research permits issued to researchers working in GSENM are for geological and geomorphological studies.

Between one-third to one-half of all permits issued to GSENM researchers are for paleontological studies. The most paleontologically important bedrock formations, largely because of their vertebrate fossil content, are the Chinle and Morrison Formations and the entire Late Cretaceous succession. Of these, the Late Cretaceous succession is unique to the planning area and holds extremely high scientific and public significance. Dozens of new dinosaur and other large vertebrate taxa (such as giant turtle and giant alligator), as well as hundreds of species of fish, turtles, amphibians, lizards, snakes, birds, and mammals, have been found (Titus et al. 2016). These finds make GSENM one of the most complete Late Cretaceous-aged terrestrial fossil vertebrate successions in the world.

Formation-by-formation summaries of resource type, distribution, and PFYC classes for all geological units in the decision area are summarized in **Table 3-43** and shown in **Figure 3-24** in **Appendix A**. **Table 3-44** summarizes the number of acres by PFYC value in the GSENM decision area. Because of the high significance of Cretaceous and other fossil resources within the decision area, the BLM has actively managed this resource since 2000. This has occurred through an in-house program, comparable to that at Dinosaur National Monument or John Day Fossil Beds National Monument, and by engaging in long-term partnerships with various museums and universities. The western Kaiparowits Plateau exhibits a high quality of animal preservation (of skin, nails, beaks, and other soft tissue) in the Kaiparowits Formation, continuity of the fossil record through the Late Cretaceous, and uniqueness of this fossil record to the Kaiparowits Plateau region. Formations exhibiting such characteristics can qualify as United Nations Educational, Scientific, and Cultural Organization World Heritage Sites.

FLPMA; 43 CFR part 49; special designation frameworks, such as national monuments; and the Paleontological Resources Preservation Act of 2009 provide the broad legal framework for federal agencies to manage fossil resources on federal lands. In the absence of a formal planning area paleontological management plan, the Annual Reports on file at GSENM and the BLM State Office discuss activities conducted through the paleontology program for the preceding year and make programmatic resource management recommendations for the subsequent year, including survey and excavation areas of concentration. These reports provide the basis for management of paleontological resources.

**Table 3-43. Paleontological Potential and Summary of Paleontological and Geological Sources of the Geologic Units Mapped within the Decision Area**

| <b>Geologic Unit Name</b>   | <b>Age</b>              | <b>PFYC<sup>1</sup></b> | <b>Overview of Fossil, Geological, and Public Interest</b>   | <b>Acres</b> |
|---|-------------------------|-------------------------|--|--------------|
| Young stream alluvium, stream alluvium, and alluvial deposits   | Holocene                | 2                       | Sediments are generally too young to contain fossils.  | 30,700       |
| Eolian sand dune and sand deposits  | Pleistocene to Holocene | 2                       | Fossils are unlikely. Eolian arid deposits typically do not contain many fossils.  | 24,400       |
| Mixed eolian and alluvial deposits and sand deposits  | Pleistocene to Holocene | U                       | Fossils are unlikely. Eolian arid deposits typically do not contain many fossils. Holocene deposits are generally too young to contain fossils. Pleistocene alluvial deposits may contain fossils.   | 143,700      |
| Slumps, landslides, and taluses   | Pleistocene to Holocene | 2                       | In situ fossils are unlikely. Fossils, if observed, will be out of their original geological context.  | 56,600       |
| Slumps, landslides, and colluvium   | Pleistocene to Holocene | U                       | In situ fossils are unlikely. Fossils, if observed in slumps or landslide deposits, will be out of their original geological context. Holocene colluvial deposits are generally too young to contain fossils, but Pleistocene deposits could contain fossils.                        | 3,700        |
| Volcanic debris flow and alluvial deposits and colluvial deposits   | Quaternary              | U                       | Primary sediments are unlikely to contain fossils, and in situ fossils are unlikely. Fossils, if observed, will be out of their original geological context.   | 1,100        |
| Alluvium, alluvial gravel, stream-terrace alluvium, alluvial terrace, pediment alluvium, alluvial-fan, colluvium, and older colluvium | Pleistocene to Holocene | U                       | No known paleontological resources exist. Holocene deposits are generally too young to contain fossils. Pleistocene deposits could contain fossils. While no megafaunal sites have been documented in the decision area, two different mammoth sites are known from just outside it. | 129,300      |
| Basalt lava flows and cinder cones  | Quaternary; Cenozoic    | I                       | No fossils are known. Occurrences are rare due to the formation of igneous rocks.  | 100          |

3. Affected Environment and Environmental Consequences (Paleontological and Geological Resources)

| Geologic Unit Name   | Age        | PFYC <sup>1</sup> | Overview of Fossil, Geological, and Public Interest  | Acres   |
|--|------------|-------------------|--|---------|
| Kaiparowits Formation  | Cretaceous | 5                 | This formation has been extensively studied. It contains abundant but irregularly distributed microvertebrates; plants; invertebrates; and vertebrates. This is the richest vertebrate fossil-producing unit in the entire region that also contains crocodylians, mammals, squamates, turtles, and dinosaur skeletons, including dinosaur mummies. Preservation is sometimes spectacular, with complete or partial articulation and softer elements, such as epidermis and the keratinous portions of beaks and claws. Rare specimens show predatory or behavioral traits, including pack hunting by tyrannosaur and turtle skeletons with egg clutches. The high concentration of fossil bones and teeth exposed at the surface results in occasional unauthorized collection by the public. Except for the State Route/Highway 12 corridor through The Blues, many Kaiparowits Formation exposures are remote and away from main travel routes. | 66,900  |
| Wahweap Formation: upper member (Coyote Point and Pardner Canyon)  | Cretaceous | 4                 | Fossils and public interest are similar to that for the lower unit(s), but most significant fossils are confined to the Coyote Point member.   | 66,600  |
| Wahweap Formation: lower member (Last Chance and Reynolds Point)   | Cretaceous | 5                 | This unit is fossiliferous throughout the planning area, with everything from petrified wood to large dinosaur skeletons. It contains numerous smaller vertebrates, such as mammals, lizards, and fish; a single tyrannosaur ( <i>Lythronax</i> ); and several horned dinosaurs and hadrosaur sites. <i>Deinosuchus</i> remains are not rare. Invertebrate sites with large terrestrial crabs, mollusks, and traces are common. Dinosaur tracksites are common between the lower and middle members. Substantial, widely distributed deposits of petrified wood occur in the lower member where wood specimens are relatively rare in the region. Historically, petrified logs at Head of the Creeks were the target of collecting (including illegal poaching) by locals in the Big Water-Church Wells-Page area. Many Wahweap Formation exposures are remote and away from main travel routes.   | 117,400 |
| Straight Cliffs Formation: Smoky Hollow Member, Tibbet Canyon Member, Drip Tank Member, and John Henry Member, undivided lower and upper members | Cretaceous | 4                 | Microvertebrates are more common than macrovertebrates. Associated dinosaur sites, including a multi-individual ornithopod bone bed, are uncommon. Large, isolated bones in stream channel lags are common locally but are not diagnostic. Terrestrial vertebrate sites are more common in the west half of the Kaiparowits Plateau. Marine vertebrate tooth and bone lags, dominated by shark teeth, as well as dinosaur trackways, occur on the eastern Kaiparowits Plateau. Petrified logs, plant fossils, and marine and freshwater invertebrates are common. Ledges and cliffs make survey work difficult. Unauthorized collecting of shark teeth and other vertebrate remains occurs in the lower portion near Tropic and Escalante; invertebrates and leaves are collected elsewhere.   | 386,400 |

3. Affected Environment and Environmental Consequences (Paleontological and Geological Resources)

| <b>Geologic Unit Name</b>                         | <b>Age</b> | <b>PFYC<sup>1</sup></b> | <b>Overview of Fossil, Geological, and Public Interest</b>  | <b>Acres</b> |
|---|------------|-------------------------|---|--------------|
| Tropic Shale: undivided and upper unit            | Cretaceous | 4                       | This shale contains abundant, often well-preserved invertebrates (for example, ammonites and oysters); fish; marine reptiles, including turtles; sharks; plesiosaurs; the oldest and most primitive mosasaurs; and the most complete Late Cretaceous Therizinosaur dinosaur in North America. This shale records important evolutionary events from the demise of the archaic pliosaurids, diversification of plesiosaurs, and the rise of the mosasaurs. Shark teeth, as well as large invertebrate fossils, were historically targeted for hobby collecting and described in rock hounding guides. The public frequents the interpretive exhibits at the Big Water Visitor Center. Large exposures occur along the Cockscomb, around Croton Road and Little Valley, and along the Straight Cliffs and the southern margin of the Kaiparowits Plateau, between the Paria River and Last Chance Canyon.   | 59,400       |
| Naturita (formerly called Dakota) Formation       | Cretaceous | 4                       | The Naturita Formation contains a diverse fossil record; however, except for shark and fish remains, vertebrate fossils are mostly in the lower member. The middle member contains a lagerstätte preservation of insects and spectacular plant fossils. The formation contains abundant vertebrate tracks, microvertebrate sites with placental and marsupial mammal teeth, and turtle shells. Other body fossils include bones of crocodylians, fish, and the occasional dinosaurs that may be preserved in small bone beds. Petrified wood is rare but occasionally occurs as logs and in situ stumps in the middle of the unit. The upper marine portion contains extensive invertebrate fossils, including a 6-foot-thick “oyster reef” deposit of shells and occasional shark teeth and unidentifiable bones. The well-preserved invertebrate fossils that occur locally at the top and plant fossils in the middle and lower units are known to hobby collectors, especially in the Cottonwood Canyon and Escalante areas. The public frequently visits in situ fossil sites such as those along Cottonwood Canyon Road. Blocks of weathered Naturita frequently form the caps on delicate hoodoos, such as at the Toadstools and Wahweap Creek. These are of immense interest to the public; if they collapsed, they may pose public hazards. Exposures are mostly along the margin of the Kaiparowits Plateau and around the Skutumpah Terrace, Henrieville, Cannonville, and Tropic. | 23,000       |
| Naturita and Cedar Mountain Formations, undivided | Cretaceous | 4                       | The Cedar Mountain Formation’s fossils are mostly reworked bone and petrified wood from older units, including the Morrison Foundation. See above for details on the Naturita Formation.  | 2,000        |

3. Affected Environment and Environmental Consequences (Paleontological and Geological Resources)

| <b>Geologic Unit Name</b>   | <b>Age</b> | <b>PFYC<sup>1</sup></b> | <b>Overview of Fossil, Geological, and Public Interest</b>  | <b>Acres</b> |
|---|------------|-------------------------|---|--------------|
| Morrison Formation  | Jurassic   | 4                       | Regionally, this formation contains an important and diverse vertebrate fauna and is famous for dinosaurs. Locally, there are no extensive bone beds, but dinosaur and other bones are frequently observed, particularly around the Salt Wash-Brushy Basin contact. The formation contains gem-grade red jasper petrified wood in the Escalante area and widespread black to gray jasper in the eastern portion of the decision area. These areas were frequented by hobby collectors for landscaping and lapidary purposes. In situ logs are of high interest to the public. Morrison exposures are limited to around Escalante, on the east side of the Kaiparowits Plateau, and along the southern margin of the Kaiparowits Plateau as far west as Wiregrass Canyon.  | 18,300       |
| Summerville Formation and/or the Tidwell Member of the Morrison Formation | Jurassic   | 4                       | As described above, the Morrison Formation is known for vertebrate fossils and petrified wood. In the Summerville Formation, body fossils are rare. Vertebrate trackways and traces, invertebrate traces, root casts, and colonial insect nests are more common.  | 300          |
| Entrada Formation: Romana Sandstone                                       | Jurassic   | U                       | Body fossils are rare. Vertebrate trackways and traces, invertebrate traces, root casts, and colonial insect nests are common and widespread over much of the southern margin of the Kaiparowits Plateau region. The in situ trackways are of high interest to the public.  | 1,400        |
| Entrada Formation: Henrieville Sandstone (or upper Entrada Sandstone)     | Jurassic   | U                       | Body fossils are rare. Vertebrate trackways and traces, invertebrate traces, root casts, and colonial insect nests are more common.   | 400          |
| Entrada Sandstone (Formation)   | Jurassic   | U                       | Fossils are rare in the lower portion, which consists of dune deposition. In the upper portion, body fossils are rare, but vertebrate trackways and traces are common and widespread, occurring in the Romana Sandstone and Escalante Sandstone units over much of the southern margin of the Kaiparowits Plateau region and west of Hole-in-the-Rock Road at the base of the Straight Cliffs escarpment. The formation also includes root casts, colonial insect nests, and other invertebrate traces. The in situ trackways are of high interest to the public, including those at north Moccasin Mountain or North Coyote Buttes, and promoted as tourist destinations. Hoodoos, such as the Toadstools, Devil's Garden, and Wahweap, are of immense interest to the public; if they collapse, they may pose public hazards. | 47,500       |
| Carmel Formation: undefined, Co-op and Crystal Creek members              | Jurassic   | 3                       | Conditions in the decision area during deposition were frequently hypersaline and toxic to most marine animals. There are few fossils, stromatolites, and invertebrate traces. Vertebrate tracks are virtually unknown, and no vertebrate body fossils are known.   | 28,400       |

3. Affected Environment and Environmental Consequences (Paleontological and Geological Resources)

| <b>Geologic Unit Name</b>  | <b>Age</b> | <b>PFYC<sup>1</sup></b> | <b>Overview of Fossil, Geological, and Public Interest</b>   | <b>Acres</b> |
|--|------------|-------------------------|--|--------------|
| Carmel Formation:page Judd Hollow member and upper members, including Winsor and Paria River                       | Jurassic   | 2                       | Conditions in the decision area during deposition were frequently hypersaline and toxic to most marine animals. There are few fossils, stromatolites, and invertebrate traces. Vertebrate tracks are virtually unknown, and no vertebrate body fossils are known.  | 94,400       |
| Page Sandstone (undivided) and Thousand Pockets Tongue; may include the Judd Hollow Tongue of the Carmel Formation | Jurassic   | 3                       | This unit contains few fossils, which are limited to tracks. Geological features of public interest include Nautilus Rock in the Paria River area.   | 33,600       |
| Temple Cap Sandstone   | Jurassic   | 3                       | This sandstone contains few fossils; tracks are most likely to be observed.  | < 100        |
| Navajo Formation (Sandstone): undivided Sandstone and Lamb Point Tongue  | Jurassic   | 3                       | Body fossils, including bones, are almost unknown due to the poor conditions that the windblown sand (dunes) offer for preserving these types of fossils. Regionally, rare body fossils occur, including tritylodontid reptiles and the dinosaurs <i>Segisaurus</i> , <i>Seitaad</i> , and <i>Ammosaurus</i> . In the decision area, most fossils are those of dinosaur and other vertebrate tracks and traces. However, there is a fish locality in the Paria Box. Especially in the Spencer Flat area, this sandstone contains iron concretions, septarian nodules, and Moqui marbles that may be similar to Martian blueberries. Navajo exposures are extremely difficult to access due to ledges or cliffy terrain. The in situ trackways are of high interest to the public, including those at north Moccasin Mountain and North Coyote Buttes. The public frequents numerous arches, bridges, and slot canyons, including between Boulder and Escalante near the Paria River. | 271,500      |
| Kayenta Formation: main body, Tenney Canyon Tongue Member, and Springdale Sandstone                                | Jurassic   | 4                       | This unit is regionally famous for vertebrate fossils of dinosaurs, mammal-like reptiles, pterosaurs, frogs, and turtles. Identifiable tetrapod fossils are rare in the decision area. Bone fragments, including whole elements, occasionally are found in the Springdale Sandstone and main body. Fossil tracks and traces are the most common fossils. Petrified wood is common in the Springdale Sandstone and occasionally in the main body. Exposures are difficult to access due to ledges or cliffy terrain. The in situ trackways are of high interest to the public, including those in the Vermilion Cliffs area (such as Flag Point, Hackberry Canyon, and Seaman Wash).  | 50,800       |
| Wingate Sandstone  | Triassic   | 3                       | This sandstone contains a lower fossil potential due to arid depositional conditions. Vertebrate body fossils are primarily limited to the Chinle-Wingate contact. Numerous tracks are on slump blocks that are not in their original stratigraphic position. Exposures are difficult to access due to ledges or cliffy terrain.   | 8,100        |



3. Affected Environment and Environmental Consequences (Paleontological and Geological Resources)

| Geologic Unit Name  | Age                  | PFYC <sup>1</sup> | Overview of Fossil, Geological, and Public Interest  | Acres  |
|---|----------------------|-------------------|--|--------|
| Moenave Formation   | Triassic to Jurassic | 4                 | This formation contains numerous types of vertebrates, invertebrates, and plants. Fossils are limited in the west (Dinosaur Canyon Member) to occasional fish, fossil trackways, and microfossils; however, there is a greater abundance of fish and other vertebrate, as well as mollusks, other invertebrates, and stromatolites, in less arid deposits up the section in the cliffs west of Flag Point (Whitmore Point member). Some previous casual collection of stromatolitic masses and root casts occurred. Generally, these fossils are difficult to access due to ledges or cliffy terrain; exposures are primarily in the Vermilion Cliffs.   | 7,900  |
| Chinle Formation: Temple Mountain, Owl Rock, Petrified Forest, Church Rock, Monitor Butte, Moss Back, and Shinarump members | Triassic             | 4                 | This unit contains very diverse flora and fauna, including vertebrates, petrified wood, other plant fossils, invertebrates, and trace fossils, including trackways. The most common vertebrate fossils are remains of metoposaurs (giant salamander-like amphibians), as well as isolated bones; armored plates; teeth of large, crocodile-like animals called phytosaurs). Unusual and rare specimens include a fully articulated <i>Poposaurus</i> (a land-dwelling crocodile-like predator). Spectacular intact petrified logs in the Circle Cliffs area are part of the second-largest Triassic-age petrified forest in North America. Logs are also common at Vermilion Cliffs but are more rare due to poor exposures and historical commercial and casual collecting. The Chinle forms part of the Chocolate Cliffs of the Grand Staircase.   | 46,900 |
| Moenkopi Formation: (upper red, Timpoweap Member, Shnabkaib, Moody Canyon, and middle red                                   | Triassic             | 3                 | This unit is not particularly fossiliferous; there are a few sites, and several produce significant material. A mixture of marine and terrestrial fossil taxa include plants, crinoids, brachiopods, gastropods, bivalves, ammonoids, nautiloids, arthropods, fish, reptiles, labyrinthodont amphibians, and reptile tracks. Important localities include ammonites and abundant horseshoe crab tracks. Reptile tracks are mostly concentrated in single-bedding horizons and typically below the Virgin Limestone. Concentrations of invertebrates in the Timpoweap and Virgin Limestone may have attracted hobby collecting, especially of well-preserved ammonite fossils. Expansive outcrops near the Paria River Box and Circle Cliffs areas are of high interest for future geological studies; this is because these provide a continuous record of events following the largest extinction on earth. The middle unit in the Circle Cliffs Uplift includes roll-front uranium-ore mineral bodies. | 61,000 |
| Moenkopi Formation: lower red member and undivided  | Triassic             | 4                 | This formation is as described above; note that the lower red member, as with the Timpoweap and Virgin Limestone, has a higher potential for unusual invertebrates, vertebrate trackways, and cephalopods than the other parts of the formation.   | 70,400 |
| Permian Formations: (undivided), including the Kaibab and Toroweap Formations   | Permian              | 3                 | This unit contains marine invertebrates that vary in distribution, taxonomy, and density by geologic unit. See individual formations for more details. Permian strata are limited to the Circle Cliffs and Buckskin Gulch (or Kaibab Gulch).   | 7,900  |

3. Affected Environment and Environmental Consequences (Paleontological and Geological Resources)

| <b>Geologic Unit Name</b> | <b>Age</b> | <b>PFYC<sup>1</sup></b> | <b>Overview of Fossil, Geological, and Public Interest</b>   | <b>Acres</b> |
|---------------------------|------------|-------------------------|--|--------------|
| Kaibab Formation          | Permian    | 3                       | Fossils, consisting of marine taxa and primarily sponges, are rare and restricted to certain beds within GSENM. The best is on the flanks of Fiftymile Mountain. Outside GSENM, fossils of a wide variety of marine taxa, including corals, crinoids, sponges, bryozoans, brachiopods, bivalves, gastropods, ammonoids, nautiloids, conodonts, and trilobites, are more common. Smaller fossils of invertebrates (such as brachiopods, corals, sponges, and clams) are the target of casual collecting, primarily of loose specimens preserved in nodular chert bodies. This formation is exposed in the Circle Cliffs and at the Type section in Buckskin Gulch (or Kaibab Gulch), which has elevated significance in the scientific community; it is a reference with which all other sections should be compared. | 5,000        |
| Toroweap Formation        | Permian    | 3                       | This formation contains occasional marine invertebrates (for example, mollusks, brachiopods, and echinoderms). Vertebrates are virtually unknown. Exposures are in Buckskin Gulch.   | 500          |
| Hermit Formation          | Permian    | 3                       | This formation contains occasional marine invertebrates (for example, mollusks, brachiopods, and echinoderms). Vertebrates are virtually unknown. Exposures are in Buckskin Gulch.   | < 100        |

Source: BLM GIS 2022; Titus et al. 2016

<sup>1</sup> PFYC classes:

1 = very low ; geologic units that are not likely to contain recognizable paleontological resources

2 = low; geologic units that are not likely to contain paleontological resources

3 = moderate; sedimentary geologic units where the fossil content varies in significance, abundance, and predictable occurrence

4 = high; geologic units that are known to contain a high occurrence of paleontological resources

5 = very high; highly fossiliferous geologic units that consistently and predictably produce paleontological resources

U = unknown; geologic units that cannot receive an informed PFYC assignment

**Table 3-44. Acres of Potential Fossil Yield Classification within the Decision Area**

| <b>PFYC</b>        | <b>Total Acres</b> |
|--------------------|--------------------|
| PFYC 1             | 100                |
| PFYC 2             | 206,100            |
| PFYC 3             | 416,000            |
| PFYC 4             | 732,000            |
| PFYC 5             | 184,300            |
| PFYC U             | 327,200            |
| <b>Total acres</b> | <b>1,865,700</b>   |

Source: BLM GIS 2022

### 3.8.1 Affected Environment

#### Current Conditions

The most significant geological features in the planning area include special deposits of minerals or mineral bodies (such as the roll-front ores of the Circle Cliffs area) and special erosional landscape features (such as slot canyons and hoodoos), but no monitoring programs are currently in place for geological features or geologic hazards. GSENM contains exceptional paleontological resources, and ongoing excavations and discoveries are facilitated by a paleontology program established in 2000. The program aims for complete surveys of sensitive areas (defined as PFYC Class 4 or 5 and areas of low designation with known fossil resources), publication of research, and public outreach.

Sites are monitored for public impacts (including theft, vandalism, and unintentional impacts), scientific potential, and condition. Scientific discoveries are shared through scientific publication and public exhibits and interpretation, with an average of 2 to 10 publications and 1 to 3 exhibits annually. The paleontology program, with the BLM's paleontological resource partners, works to ensure collections of paleontological and geological resources are managed to curatorial standards. Public collection of collectible commodities such as petrified wood is banned, but looting from certain areas is common; there are typically between two and five documented cases of illegal fossil collection or resource destruction annually.

#### Trends

Visitor use in the planning area is increasing, which will increase the probability of impacts on unique or significant paleontological and geological features and materials. Instances of illegal fossil collection or resource destruction have increased since GSENM's establishment in 2000, but there have been few formal citations or prosecutions. Recent scientific analyses have concentrated on the stratigraphy of the Cretaceous Wahweap and Kaiparowits Formations, biofilms that inhabit rocks, and concretions of Navajo Sandstone. The number of annual publications on GSENM paleontology has steadily increased since 2000, with higher numbers indicating effective, proactive management of the research component.

The number of major resource partners has been stable over the years; however, recently, two major partners (the Denver Museum of Nature and Science and the Raymond Alf Museum) suspended their field activities in GSENM. It is likely that this will lead to a decrease in the number of annual publications on GSENM fossils, but other impacts remain to be seen. The acres and number of field sites with significant fossil potential that are monitored and inventoried annually have remained relatively constant since 2000, when the inventory program was established. Likely as a result, the number of significant fossils collected and curated annually has also remained relatively constant.

### **Forecasts**

Geological features that may need protection given increasing visitor trends in GSENM include the Devil's Garden and Wahweap hoodoos, the Cockscomb, the Toadstools, arches, bridges, and slot canyons. An increase in illegal hobby collecting may necessitate more aggressive law enforcement to curb the problem. Targets of illegal collection could include iron concretions, septarian nodules, agates, fossil oysters and ammonites, vertebrate fossils, and petrified wood. Ongoing paleontological discoveries will continue to make invaluable contributions to the understanding of the earth's past. Given the general trend of current intensive paleontological resource management, the number of scientifically important fossil specimens in museums will increase, the number of scientific publications and described species will increase, public enjoyment and understanding of the unique nature of the resource should increase, and the protection of important in situ fossil sites should continue. Paleontological outreach efforts should also help counter looting and vandalism and lead to greater citizen stewardship. GSENM-specific paleontological guidance documents would help advance scientific goals and resource protection, preservation, and conservation. It is anticipated that additional curatorial space could be necessary to safely house newly collected specimens within the life of the RMP.

### **3.8.2 Environmental Consequences**

Refer to **Section F.13**, Paleontological and Geological Resources, in **Appendix F**, Analytical Framework, for descriptions of the indicators, analysis areas, and assumptions used for the following analysis.

#### **Issues**

- How would proposed management decisions regarding paleontological resource management (such as curation, protection, survey, collection, outreach, and interpretation) impact paleontological resources, research communities, local communities, and visitor experiences?
- How would land use allocations and discretionary actions impact paleontological resources?
- How would land use allocations and discretionary actions impact unique geological features?

#### **Impacts Common to All Alternatives**

Under all alternatives, adherence to the proclamation; existing laws, such as the Paleontological Resources Preservation Act of 2009; and BLM policies (for example, manuals and handbooks) would manage to protect paleontological resources within the decision area. Continued scientific work by qualified researchers on BLM-managed land would add further knowledge about the area's paleontological resources, resulting in opportunities for improved future management decisions and protection of these nonrenewable resources. While specific goals, objectives, and management direction vary slightly between Alternative A and Alternatives B, C, D, and E, many of the key elements are the same. These include a focus on public access and the identification of paleontological sites and specimens appropriate for research, protection, conservation, and interpretation (or public access).

Under all alternatives, management direction includes a focus on proactive inventory and conservation research or interpretation within geologic units mapped as PFYC Classes 4 and 5. Under all alternatives, the BLM will develop a paleontological resources plan. The plan would focus on management (that is, Alternative A) or management and implementation (that is, Alternatives B, C, D, and E).

Coordination with academic institutions, interested stakeholders, and appropriate state and local governments, including counties and municipalities, would be consistent under all alternatives. Under all

alternatives, management would focus on the development of a consistent PFYC system throughout the decision area and protocols for the inventory, collection, and protection of paleontological resources; public involvement; community interpretation; and monitoring of conditions and trends. While the components of the plan would also be similar for Alternative A and Alternatives B, C, D, and E, Alternatives B, C, D, and E specifically also would mention the development of a catalog of field locations of baseline inventories, annual inventory monitoring and collection, and development of site security plans and collection management strategies.

The BLM would consider the mitigation of impacts on paleontological resources in management decisions under all alternatives. Actions that could affect paleontological resources would be assessed (for example, prior to any surface disturbance), and the following would be undertaken: an assessment, including determining the PFYC of geological units involved in the activity; a compilation of known paleontological resources in the area; and a consideration of potential effects based on the nature of the activity. Consistent with BLM guidelines, activities that would disturb the geologic units of PFYC Class 4 or higher would typically require an on-the-ground evaluation by a qualified paleontologist. Additionally, activities that would disturb the geologic units with PFYC Classes 3 and U also may require this evaluation based on BLM guidelines. Once this assessment is completed, a mitigation plan would be developed to protect paleontological resources; this plan would include avoidance, pre-disturbance salvage, professional monitoring during construction, and stop-work authorizations if paleontological resources are uncovered.

Increased awareness and opportunities for hands-on education for paleontological resources have increased the potential for the long-term preservation of unique and important paleontological resources. By collaborating with local communities, universities, and museums, the BLM can assist in developing areas for public casual collecting of paleontological resources, such as common invertebrates, shells, silicified wood, and leaves, on BLM-managed land. These educational activities should be diverse and inclusive in nature while informing the public on the preservation and protection of paleontological resources through applicable laws, regulations, and policies that protect these resources. The BLM would develop specific plans for areas rich in common and collectible paleontological resources such that the impacts would be limited while still providing opportunities for fossil collecting for curation and research purposes, and for casual collection in adherence with the exercise of religion under the Religious Freedom Restoration Act, and facilitating active public engagement and further research in the planning and decision areas. This would improve the overall knowledge and stewardship of these resources.

All alternatives generally limit the extent of surface disturbance in GSENM (for example, withdrawn from mineral entry and no casual collection). Along with general paleontological management, all alternatives are anticipated to support the proper care and management of GSENM paleontological objects by limiting new major development and disturbance in GSENM.

Under all alternatives, any management decisions that include increased areas of allowed surface disturbance, such as construction, ROW leasing, increases in recreation, and increases in OHV use, could affect paleontological resources. Unmitigated surface-disturbing activities could dislodge or damage paleontological resources and features that were not visible before surface disturbance. Crushing, breaking, or displacement of paleontological resources could result in the permanent loss of the resources, the scientific data they could provide, and the associated contextual data. Where surface disturbance is not mitigated or reclaimed, paleontological resources may be subjected to long-term damage or destruction from erosion. If surface disturbance is regulated and proper mitigation and preservation

processes are followed, these activities could expose scientifically significant fossils that would otherwise remain buried and unavailable for scientific study.

Actions that provide further human access to BLM-managed lands and lead to activities like vandalism and unauthorized collection could also impact paleontological resources. These impacts can be reduced through actions such as enforcement of existing laws, resource monitoring, and mitigation that may include limiting or regulating access. With programs targeted toward education and outreach, the impact of human recreation on paleontological resources can be limited. Additionally, through the discovery of previously unknown paleontological resources, positive impacts can occur on these resources if proper laws are followed and authorities are notified. Such fossils, if collected properly and curated into the museum collection of a qualified repository, would be available for future scientific study and education.

If surface-disturbing activities and human use are unmitigated, they could also impact unique geological features. However, mitigation for impacts on unique geological features is usually included at the implementation level. Without mitigation, these features could be permanently altered or modified if they shift, move, or crack due to changing conditions from ground disturbance or visitor use. The balanced pedestal rock formations known as hoodoos can be particularly vulnerable to damage due to their delicate nature. Features such as these can be knocked over by equipment or by vandals. Larger features, such as arches and bridges, are generally less susceptible to impacts brought about by landscape-level management actions. The potential for impacts on any kind of geological feature varies by alternative, depending on the overlap of ground disturbance or visitor-use areas with geologic units that contain these features.

Per the proclamation, disposal of lands within GSENM is not allowed, except possibly by exchange that furthers the protective purposes of GSENM. Thus, to complement or enhance existing GSENM objects, land exchange and land acquisition from willing landowners may occur under all alternatives. If BLM-managed lands are disposed of and removed from federal ownership, they no longer retain any BLM protection for paleontological resources. Paleontological resources on land that will be retained (or acquired) by the BLM will be protected by federal laws and policies protecting paleontological resources on BLM-managed lands.

Areas open for ROW authorization could have more ground disturbance from possible surface-disturbing activities than areas with ROW avoidance or exclusion areas. To reduce the potential for impacts on paleontological resources from ROW actions, paleontological resource evaluations and subsequent mitigation could be completed.

Construction of structures to support livestock grazing (for example, stock ponds, dams, and roads) would increase surface disturbance and could impact paleontological resources. Also, livestock grazing reduces vegetation within an area and could cause increased erosion of the soil and exposure of paleontological resources underlying the area. Livestock also could trample and destroy any paleontological resources if these resources are present at or near the surface.

Managing and protecting natural environments and ecosystems (for example, soils, vegetation, forests, riparian areas, floodplains, and WSAs) and wildlife habitats can further reduce erosion within these environments and thereby decrease impacts on paleontological resources. In some cases, management of these other resources may require additional assessment prior to paleontological excavation (for example, on slopes greater than 30 percent) or after an excavation is initiated, but not completed, within a specific period (2 or 3 years).

Wildfires can adversely affect surface and shallowly buried paleontological resources, especially when they occur on steep slopes where vegetation has been previously burned. In such cases, soil stability is compromised, causing a higher chance for increased erosion. Fire and fuels management may reduce this risk of direct and indirect impacts on paleontological resources from wildfire, but vegetation management that include ground disturbance can directly impact paleontological resources. The magnitude would vary by alternative depending on the methods authorized.

Visual resource management decisions could indirectly impact paleontological resources in specific areas. Where minimal visual change from human activity is allowed (VRM Class I), known and unknown paleontological resources are less likely to be impacted from these activities. Areas where major modifications of the existing landscape are allowed (VRM Class IV) have a higher potential for ground-disturbing activities, increased human activity, and impacts on paleontological resources. The greatest impact—positive or negative—on paleontological resources from VRM management decisions would be in PFYC Class 4, 5, or U areas. The BLM would manage impacts as previously discussed for surface disturbance and increased human activities.

Areas managed for recreation, such as SRMAs, RMZs, and ERMAAs, could have increased risk for direct, indirect, and inadvertent damage to paleontological resources from concentrated recreation and increased localized visitor use. Recreational activities can physically alter exposed or shallow paleontological resources, leading to damage from erosion and unauthorized collection and vandalism. However, specifically because these risks occur in concentrated areas like trails, GSENM managers may be able to better manage recreation in ways that minimize the potential for damage to paleontological resources than in other unregulated recreation areas where effects are more difficult to anticipate, monitor, and mitigate.

Prior to the creation or expansion of areas managed and developed for specific recreation, a paleontological resource assessment would evaluate the underlying geologic units for the paleontological potential and address further needed assessment or mitigation. Impacts within areas managed for recreation could be further mitigated through limited OHV travel, monitoring of hiking and biking trails, and designating camping areas, especially in or near geologic units with PFYC Classes 4 and 5. Overall, recreational use can improve knowledge of paleontological resources if federal laws, regulations, and policies are followed, and the public is educated on these processes.

Given current visitor trends, human activity will increase within the decision area both in and out of areas formally managed for recreation. These increased actions could uncover previously unknown paleontological resources; if the discoveries are handled properly, they could add to the paleontological knowledge of the region. However, this process would rely on BLM-supported community engagement and education on the preservation of the resource.

Land with special designations, RNAs, are afforded special management measures designed to protect a variety of resource values. Since this management typically results in regulated use and limits human-caused surface disturbance, these decisions could also protect potential paleontological resources within these areas. All alternatives would include the No Mans Mesa RNA (ACEC) (1,500 acres). This RNA (ACEC) contains only geologic units with PFYC Classes 2 (96 percent of the area) and 3 (4 percent of the area); it does not include any PFYC Class 4 or 5 geologic units. Thus, the additional protection for paleontological resources is limited.

Like areas with stringent VRM classifications, special designation areas, including ACECs, WSAs, [Instant Study Areas \(ISAs\)](#), and WSRs, are afforded special management measures designed to protect a variety of resource values. Management measures vary but generally include stringent VRM classifications, surface use restrictions, ground disturbance restrictions, motorized and OHV travel prohibitions, annual monitoring, and other restrictions on development and resource use, including impacts on the soundscape (that is, the maximum decibels (dBA) permitted at facilities). Thus, management of these areas would further regulate use and overall would limit human-caused surface disturbance.

Paleontological resources in these areas would be preserved in situ or would be collected only through an approved paleontological resources use permit. New discoveries from development would be less likely than in other portions of the decision area, but permits for scientific uses would be considered if these uses are compatible with the resource values that the designation is protecting.

Management of WSRs specifically would help to reduce erosion and help the rivers maintain their natural channel. Under all alternatives, designated WSRs cross less than 1 percent of the decision area (202 acres), and the geologic units and associated PFYC values do not vary by alternative. Under all alternatives, 47 percent of the decision area (881,100 acres) is designated as ISAs and WSAs. Since these locations do not vary by alternative, the potential for impacts on paleontological resources based on paleontological resource potential (that is, the PFYC) does not vary by alternative.

#### **Alternative A**

Under Alternative A, the BLM would continue to manage paleontological resources in accordance with the 2020 Approved RMPs, except where those management decisions do not align with the [proclamation](#). Under Alternative A, there are no defined goals, objectives, or management directions that discuss geological resources (or unique geological features).

Management for other resources may have an impact on paleontological resources. For example, vegetation management direction under Alternative A includes the full range of treatment methods and tools authorized. These methods can result in ground disturbance and could impact paleontological resources if the treatments are performed in areas of high paleontological potential (for example, PFYC Classes 4 and 5).

Under Alternative A, [630,400 acres](#) of BLM-managed land in the decision area would be open to ROW authorization, including [254,800 acres](#) of areas with PFYC Classes 4 and 5. Of the remaining PFYC Classes 4 and 5 areas within the decision area, 588,500 acres would continue to be within ROW exclusion areas and 193,200 acres would continue to be in ROW avoidance areas with limited or no surface disturbance or potential disturbance of paleontological resources.

Within the 2 ERMA, 10 RMZs, and 5 SRMAs that cover the entire decision area under Alternative A, most (98 percent) PFYC Classes 4 and 5 areas are in one of the two ERMAs. In these ERMAs, management would be interdisciplinary; recreation would have the same value as other resource uses. While SRMAs are like ERMAs in that management focuses on recreation, in SRMAs, the predominant land use focus of the area and management may place restrictions on other resource uses. The potential for impacts on unknown paleontological resources increases with the amount of area and the PFYC value of the geologic unit exposed within the recreation area. The potential also varies by the type and intensity of recreation uses and development. For example, continued surface disturbance, followed by subsequent erosion, from



such ground-disturbing activities as OHV open travel could have a negative impact on unknown paleontological resources in these areas.

Under Alternative A, 1,046,900 acres of PFYC Classes 4 and 5 would have OHV travel limited to designated routes, and 1,100 acres PFYC Class 2 and 400 acres of PFYC 4 would be closed to OHV travel. Under Alternative A, a small portion of the decision area would continue to be open with no limitations (100 acres, all PFYC Class 4). Keeping OHV travel closed in areas, especially those with underlying rock units of PFYC Classes 4 and 5, would reduce both surface disturbance and human impacts on paleontological resources. Limiting OHV travel to designated routes would limit new areas of erosion and surface disturbance in geologic units with PFYC Classes 4 and 5; however, this could increase public access to these areas, which could increase the impact on paleontological resources. Community outreach and education on identifying fossils and notifying authorities if paleontological resources are found may reduce the impact on these resources.

Under Alternative A, 1,018,400 acres of PFYC Classes 4 and 5 would continue to be open for grazing. These areas could have increased erosion from surface disturbance through construction of support structures (for example, stock ponds, dams, and roads) or from the trampling and reduction in vegetation from grazing.

As previously noted under *Effects Common to All Alternatives*, the protection of other resources through management decisions, such as VRM, could reduce potential impacts on paleontological resources. VRM Class IV areas would have the least indirect protection for known and unknown paleontological resources. VRM Class I areas would have the most protection. Under Alternative A, 588,400 acres of areas with PFYC Classes 4 and 5 are in VRM Class I areas; 182,500 acres are in VRM Class II areas; 166,900 acres are in VRM Class III areas; and, unlike all other alternatives, which do not have any area in VRM Class IV, 109,300 acres are in VRM Class IV areas. Under Alternative A, VRM offers the most potential for impacts on paleontological resources; this is because it has the least amount of VRM Classes I and II acres and is the only alternative to have VRM Class IV areas.

Under Alternative A, of the 377,500 mapped acres of geologic units with critical geological features, 73 percent are ROW avoidance or exclusion areas, and 27 percent are open to ROWs. Ninety-nine percent are within areas open to OHV travel or limited to designated routes; 94 percent of the acres are within VRM Class I or II management areas. Additionally, all these acres are also included in two ERMAs (95 percent), multiple RMZs (2 percent), or SRMAs (5 percent). Areas open for ground disturbance and concentrated recreation increase the potential for intentional or inadvertent impacts on the unique geological features that may overlap these resource uses. Management of recreation types and locations and limitations to surface disturbance because of other resource management decrease the potential for adverse effects on unique geological features.

### **Alternative B**

The effects under Alternative B would be the same as those described under Alternative A except for the descriptions noted below.

Under Alternative B, the BLM would not continue to manage paleontological resources in accordance with the 2020 Approved RMPs. While similar to Alternative A, Alternative B includes slightly more emphasis on developing protocols, implementation plans, and management strategies. Management

direction for Alternatives B, C, and D would be to identify geological sites appropriate for public access and proactively maintain an annual program of inventory, monitoring, and, where appropriate, collecting and curating geological resources with a focus on areas identified in the proclamation.

Under Alternative B, management for other resources could have an impact on paleontological resources.

Under Alternative B, the BLM would open 545,400 acres less of the decision area to ROW authorization than under Alternative A, including 211,300 acres fewer of PFYC Classes 4 and 5 areas. Of the remaining areas of PFYC Classes 4 and 5, 372,400 acres would be within ROW avoidance areas and 624,100 acres would be within ROW exclusion areas; this is 214,800 more acres managed in ROW exclusion or avoidance than under Alternative A. Potential impacts on paleontological resources from ROW authorizations would be limited or eliminated in these areas under Alternative B.

The RMAs (eight ERMAs, six SRMAs, and three RMZs) under Alternative B, like under Alternative A, cover the decision area and include the majority (99 percent) of PFYC Classes 4 and 5 areas. Based on the recreation area type alone, impacts on paleontological resources would be like those under Alternative A; most of the decision area would be included in an ERMA where management is interdisciplinary, and recreation would have the same value as other resources or resource uses. As previously noted, surface disturbances related to human use and development in recreation areas could impact paleontological resources, depending on the type, intensity, and PFYC value of the area impacted. Since management of these types of impacts vary between ERMAs, these differences in management are generally discussed for each specific resource or use (for example, ROWs and OHV use).

Unlike under Alternative A, under Alternative B, no lands would be managed as OHV open areas. Instead, the BLM would manage the entire area as closed or open with travel limited to designated routes. This includes 634,100 acres closed and 413,300 acres limited of PFYC Classes 4 and 5 areas within the decision area, respectively. As noted previously, travel on designated routes would limit new areas of erosion and surface disturbance, and closing areas to OHV use would further limit impacts. The potential for OHV-related impacts under Alternative B would be lower than under Alternative A because all acres closed under Alternative B would be open or open with limited travel under Alternative A.

Compared with Alternative A, land available for livestock grazing under Alternative B would decrease with 52,500 fewer acres of PFYC Classes 4 and 5 areas (or 5 percent less of the total PFYC Classes 4 and 5 areas in the decision area). Closed areas could have decreased impacts from grazing management decisions relative to Alternative A.

Under Alternative B, 49,800 acres more of PFYC Classes 4 and 5 areas would be in VRM Class I areas, and 77,300 acres more would be in VRM Class II areas than under Alternative A. There would be no VRM Class IV areas. Human activities would be less likely to impact additional PFYC Classes 4 and 5 acreages in VRM Class I and II areas under Alternative B than under Alternative A, where they would be within VRM Class IV areas.

Unlike Alternative A, which would not include areas to be managed to protect wilderness characteristics, under Alternative B, the BLM would manage 46,200 acres of PFYC Classes 4 and 5 areas within the decision area to protect wilderness characteristics. Protecting lands with wilderness characteristics over all other uses would, in turn, help protect paleontological resources by severely limiting the area from most human surface-disturbing activities. Minimizing the impacts on lands with wilderness characteristics

while emphasizing multiple uses would help to reduce impacts on paleontological resources by limiting, reducing, and excluding areas for surface-disturbing activities. These restrictions could also limit the BLM's ability to authorize the excavation of paleontological resources.

### **Alternative C**

The effects under Alternative C would be the same as those described under Alternative A except for the descriptions noted below.

Under Alternative C, the decision area would be divided into four areas; resource management would vary between areas, with generally the most restrictions for ground-disturbing uses in the primitive areas and the least restrictive actions in the front country area. These management decisions could impact paleontological resources positively or negatively depending in part on the PFYC values of the area. The amount of areas with PFYC Classes 4 and 5 varies between areas, as the total acreage of each area varies. The majority (73 percent, or 765,200 acres) would be in the primitive country area, 25 percent would be in the outback area, 1 percent would be in the passage area, and the remaining 1 percent would be in the front country area.

Because management specific to paleontological resources would be the same as under Alternative B, the related impacts on paleontological resources would be the same as those described under Alternative B. Under Alternative C, management for other resources could impact paleontological resources.

Under Alternative C, the BLM would open **545,400 acres** less of the decision area to ROW authorization than under Alternative A, including **248,600 acres** less of PFYC Classes 4 and 5 areas. Most areas with PFYC Classes 4 and 5, **777,700 acres** would be within ROW exclusion areas, and **253,400 acres** would be within ROW avoidance areas; this is **60,200 more acres in ROW avoidance** than under Alternative A. Potential impacts on paleontological resources from ROW authorizations would be limited or eliminated in these areas under Alternative C.

Under Alternative C, the RMAs (8 ERMAs and 14 SRMAs) would cover **48** percent of the decision area (**961,600 acres fewer than Alternative A**) and include **516,600 acres** (or **49** percent) of PFYC Classes 4 and 5 areas. Impacts from managed recreation **may be more dispersed** under Alternative C than under Alternative A; however, the types of impacts would be consistent. Where quantitative information is available, these types of impacts are discussed by specific resource or use (for example, ROWs and OHV use).

Under Alternative C, no lands would be managed as OHV open areas; instead, the BLM would manage the entire area as closed or limited to designated routes. This includes **790,200 acres** of areas with PFYC Classes 4 and 5 within the decision area closed to OHV use, which is **788,700 acres** more than under Alternative A. The remaining **257,100 acres** of PFYC Classes 4 and 5 areas would be limited to travel on **designated routes**. As noted previously, travel on designated routes would limit new areas of erosion and surface disturbance. The potential for OHV-related impacts under Alternative C would be lower than under Alternative A because all areas closed under Alternative C would be open or limited to **designated routes** under Alternative A.

Compared with Alternative A, land available for livestock grazing would decrease under Alternative C. **Impacts on** paleontological and geological resources would be similar to Alternative B.

Unlike under Alternative A, under Alternative C, 56,300 acres of the decision area would be within two RNAs (ACECs), which includes 3 percent of the PFYC Classes 4 and 5 areas (36,600 acres) that are within the decision area. As described in *Effects Common to All Alternatives*, any potential paleontological resources within the boundaries of these RNAs (ACECs) would have added protection through management that regulates use and limits human-caused surface disturbance. When compared with Alternative A, there would be increased protection within the boundaries of RNAs (ACECs) and the potential paleontological resources they contain.

Under Alternative C, 168,300 acres more with PFYC Classes 4 and 5 would be in VRM Class I areas; 60,100 acres more would be in VRM Class II areas; and 118,800 acres less would be in VRM Class III areas than under Alternative A. There would be no VRM Class IV areas under Alternative C. Compared with Alternative A, human activities would be less likely to impact the additional PFYC Classes 4 and 5 acreage in VRM Classes I and II areas under Alternative C; this is because those acres would be within VRM Class IV areas under Alternative A.

Unlike Alternative A, Alternative C would include areas to be managed to protect and minimize impacts on lands with wilderness characteristics. Protecting lands with wilderness characteristics over all other uses would, in turn, help protect paleontological resources by severely limiting the area from most human surface-disturbing activities. Minimizing the impacts on lands with wilderness characteristics while emphasizing uses would help to reduce impacts on paleontological resources by limiting, reducing, and excluding areas for surface-disturbing activities. These restrictions could also limit the BLM's ability to authorize the excavation of paleontological resources. Under Alternative C, 13 percent (138,900 acres) of the areas with PFYC Classes 4 and 5 within the decision area would be managed to minimize impacts, and 12 percent (or a total of 129,200 acres) of the PFYC Classes 4 and 5 areas in the decision area would be managed for protecting lands with wilderness characteristics. Thus, the restrictions on disturbance and protection for potential paleontological resources would be greater under Alternative C than under Alternative A.

Of the mapped acres of geologic units that have critical geological features, under Alternative C, 25 percent would be in the outback area, 2 percent would be in either the front country or passage areas, and 73 percent would be in the primitive area. Due to more restrictive management of the outback and primitive areas, geological features would have increased protection and a decreased potential for impacts than those with fewer restrictions and easier access. There would be no similar divisions under Alternative A.

In addition, under Alternative C, of the acres of mapped geologic units that have critical geological features, 100 percent would be managed as avoidance or exclusion areas compared with under Alternative A. A total of 354,300 more acres would be closed to OHV travel than under Alternative A (an additional 212,300 acres of PFYC Classes 4 & 5). Under Alternative C, 95 percent of the unit with critical geological features would be within VRM Class I or II management areas, which is slightly higher than under Alternative A. Additionally, 49 percent of areas in PFYC Classes 4 and 5 would be included in multiple ERMAs and SRMAs under Alternative C. Overall, compared with under Alternative A, fewer acres of geologic units that contain critical geological features would be within areas of potential ground disturbance. Impacts from recreation would be similar to those described under Alternative A. However, with more dispersed recreation under Alternative C than Alternative A, the impacts could be more dispersed throughout GSENM.

### **Alternative D**

Effects under Alternative D would be the same as those described under Alternative A except for the descriptions noted below.

Group size would also be limited under Alternative D, which would follow RMA prescriptions, where applicable, and be limited to 12 individuals. This limit is slightly less than half of the default allowed under Alternative A. One major difference under Alternative D is that unlike Alternative A, Alternative D would not specify that exceptions would be considered on a case-by-case basis approved by the BLM Authorized Officer. This could limit the size of paleontological field teams in some areas.

Vegetation management direction under Alternative D would be more restrictive than under Alternative A. Under Alternative D, the BLM would prioritize natural processes and techniques, which is expected to result in less ground disturbance than the full range of treatment methods and tools authorized under Alternative A. These more restrictive methods could reduce the potential impact on paleontological resources if the treatments are in areas of high paleontological potential (for example, PFYC Classes 4 and 5).

Under Alternative D, 356,600 more acres of PFYC Classes 4 and 5 would be managed under ROW exclusion areas than Alternative A. Potential impacts on paleontological resources from ROW authorizations would be eliminated in these areas under Alternative D. Under Alternative D 900 acres would be PFYC Class 4 within areas designated as open to ROWs, and 91,300 acres would be managed as ROW avoidance.

The RMAs (5 ERMA and 9 SRMA) under Alternative D would cover the least amount of the decision area (22 percent) and would include 279,100 acres (or 27 percent) of PFYC Class 4 and 5 areas. Under Alternative D, impacts from managed recreation would have the potential to occur in less area than under Alternative A; however, the types of potential impacts would be the same as those described under Alternative A (for example, from, OHVs, and vandalism or unauthorized fossil collection).

As compared with Alternative A, Alternative D would have more acres managed as closed to OHVs, including 856,500 acres of mapped PFYC Classes 4 and 5 geologic units (856,400 more acres than Alternative A). No acreage would be managed as open with no limitations. This additional management would add additional protection to potential paleontological resources in these areas compared with Alternative A.

When compared with Alternative A, management under Alternative D would increase land unavailable for livestock grazing, including 659,000 more acres of PFYC Classes 4 and 5 geologic units. Compared with Alternative A, these areas closed to grazing could have decreased impacts from grazing management decisions. Even with decreased acreage, under Alternative D, 52 percent of the lands open to grazing would be in areas with PFYC Classes 4 and 5. Impacts of grazing on paleontological resources in these areas would be the same as those described under Alternative A.

Alternative D is different from Alternative A because there would be no VRM Class III or VRM Class IV areas. Under Alternative D, 271,600 acres more of the PFYC Classes 4 and 5 areas within the decision area would be in VRM Class I areas than under Alternative A, and 4,900 more acres would be in VRM Class II areas than under Alternative A. Human activities would be less likely to impact the additional

PFYC Classes 4 and 5 acreage in VRM Class I areas under Alternative D compared with under Alternative A, where those acres would be within VRM Class III or IV areas.

Unlike Alternative A, Alternative D would include areas to be managed to protect impacts on lands with wilderness characteristics. Of the areas designated PFYC Classes 4 and 5 within the decision area, 269,300 acres would be managed to protect impacts on lands with wilderness characteristics under Alternative D. Thus, the restrictions on disturbance and protection for paleontological resources would be greater under Alternative D than under Alternative A. The potential for overlap of paleontological excavations and lands with wilderness characteristics would also be greater, potentially limiting excavations.

Under Alternative D, 356,000 more acres of PFYC Classes 4 and 5 would be managed as ROW exclusion areas and 101,900 acres less of PFYC Classes 4 and 5 would be managed as ROW avoidance than under Alternative A. Only 2,300 acres would be managed as open to ROWs (the least amount of any alternative). Also, 356,600 more acres of areas with PFYC Classes 4 and 5 would be excluded to OHV travel. The remaining units with critical geological features would be managed as travel limited to designated routes. Unlike under Alternative A, 99 percent of units with critical geological features would be within VRM Class I or II management areas, and none would be managed as VRM Class III or IV areas.

Additionally, 27 percent of units with critical geological features would be included in multiple ERMAs and SRMAs under Alternative D. These geologic interest areas would comprise a smaller portion of the overall RMAs under Alternative D than under Alternative A. Overall, fewer acres of geologic units that contain critical geological features would be within areas of potential ground disturbance under Alternative D than under Alternative A. Impacts from recreation would be similar but with more dispersed recreation under Alternative D than under Alternative A. The impacts and monitoring efforts associated with recreation under Alternative D could be more dispersed.

### **Alternative E**

The effects under Alternative E would be the same as those described under Alternative A except for the descriptions noted below.

Under Alternative E, the decision area would be divided into four areas; resource management would vary between areas, with generally the most restrictions for ground-disturbing uses in the primitive areas and the least restrictive actions in the front country area. These management decisions could impact paleontological resources positively or negatively depending in part on the PFYC values of the area. The number of areas with PFYC Classes 4 and 5 varies between areas, as the total acreage of each area varies. The majority (73 percent, or 765,200 acres) would be in the primitive country area, 25 percent would be in the outback area, 1 percent would be in the passage area, and the remaining 1 percent would be in the front country area (the same numbers as Alternative C).

Because management specific to paleontological resources would be the same as under Alternatives B and C, the related impacts on paleontological resources would be the same as those described under those alternatives. Under Alternative E, management for other resources could impact paleontological resources.

Under Alternative E, the BLM would open 619,600 acres less of the decision area to ROW authorization than under Alternative A, including 248,600 acres less of PFYC Class 4 and 5 areas. Areas with PFYC Classes 4 and 5, 619,600 acres would be within ROW exclusion areas, and 253,400 acres would be within

ROW avoidance areas; this is 60,200 more acres than under Alternative A. Potential impacts on paleontological resources from ROW authorizations would be limited or eliminated in these areas under Alternative E.

Under Alternative E, the RMAs (16 ERMAs and 17 SRMAs) would cover 48 percent of the decision area (compared to roughly 100% of GSENM managed under RMAs under Alternative A) and would include 525,000 acres (or 40 percent) of PFYC Classes 4 and 5 areas. Impacts from managed recreation would occur in a more dispersed area under Alternative E than under Alternative A; however, the types of impacts would be consistent. Where quantitative information is available, these types of impacts are discussed by specific resource or use (for example, ROWs and OHV use).

Under Alternative E, no lands would be managed as OHV open areas; instead, the BLM would manage the entire area as closed or limited to designated routes. This includes 790,200 acres of areas with PFYC Classes 4 and 5 within the decision area closed to OHV use, 790,100 more acres than under Alternative A. The remaining 257,000 acres of PFYC Classes 4 and 5 areas would be open with limited travel. As noted previously, travel on designated routes would limit new areas of erosion and surface disturbance. The potential for OHV-related impacts under Alternative E would be lower than under Alternative A because all areas closed under Alternative E would be open or open with limited travel under Alternative A.

Compared with Alternative A, land available for livestock grazing would decrease under Alternative E with a decrease of 52,700 acres of areas in PFYC Classes 4 and 5 under Alternative E. No NPS lands would be available for grazing under Alternative E. Closed areas could have decreased impacts from grazing management decisions relative to Alternative A.

Unlike under Alternative A, under Alternative E, 56,300 acres of the decision area would be within two RNAs (ACECs), which includes 3 percent of the PFYC Classes 4 and 5 areas (36,600 acres) that are within the decision area. As described in *Effects Common to All Alternatives*, any potential paleontological resources within the boundaries of these RNAs (ACECs) would have added protection through management that regulates use and limits human-caused surface disturbance. When compared with Alternative A, there would be increased protection within the boundaries of RNAs (ACECs) and the potential paleontological resources they contain.

Under Alternative E, 168,300 more acres or areas with PFYC Classes 4 and 5 would be in VRM Class I areas; 60,500 acres more would be in VRM Class II areas; and 119,200 fewer acres would be in VRM Class III areas than under Alternative A. There would be no VRM Class IV areas under Alternative E. Compared with Alternative A, human activities would be less likely to impact the additional PFYC Class 4 and 5 acreage in VRM Class I and II areas under Alternative E; this is because those acres would be within VRM Class IV areas under Alternative A.

Unlike Alternative A, Alternative E would include areas to be managed to protect and minimize impacts on lands with wilderness characteristics. Protecting lands with wilderness characteristics over all other uses would, in turn, help protect paleontological resources by severely limiting the area from most human surface-disturbing activities. Minimizing the impacts on lands with wilderness characteristics while emphasizing uses would help to reduce impacts on paleontological resources by limiting, reducing, and excluding areas for surface-disturbing activities. These restrictions could also limit the BLM's ability to authorize the excavation of paleontological resources. Under Alternative E, 100,800 acres of the areas

with PFYC Classes 4 and 5 within the decision area would be managed to minimize impacts, and 165,800 acres of the PFYC Class 4 and 5 areas in the decision area would be managed for protecting lands with wilderness characteristics. Thus, the restrictions on disturbance and protection for potential paleontological resources would be greater under Alternative E than under Alternative A.

Of the 377,700 mapped acres of geologic units that have critical geological features, under Alternative E, 25 percent would be in the outback area, 3 percent would be in either the front country or passage areas, and 73 percent would be in the primitive area. Due to more restrictive management of the outback and primitive areas, geological features would have increased protection and a decreased potential for impacts than those with fewer restrictions and easier access. There would be no similar divisions under Alternative A.

In addition, under Alternative E, of the acres of mapped geologic units that have critical geological features, 80 percent (all but 259,500 acres) would be managed as avoidance or exclusion areas, 6,200 fewer acres open to ROW than under Alternative A. A total of 790,100 more acres of areas in PFYC Classes 4 and 5 would be closed to OHV than under Alternative A, and the remaining areas of PFYC Classes 4 and 5 would be managed as travel limited to designated routes, with no areas managed as open to OHV. Under Alternative E, 98 percent of the unit with critical geological features would be within VRM Class I or II management areas, 269,100 more acres than Alternative A. Additionally, 40 percent of areas of PFYC Classes 4 and 5 would be included in multiple ERMAs and SRMAs under Alternative E. Overall, compared with Alternative A, fewer acres of geologic units that contain critical geological features would be within areas of potential ground disturbance. Impacts from recreation would be similar to those described under Alternative A. However, with more focused recreation under Alternative E than Alternative A, the impacts could be more concentrated.

### **Cumulative Impacts**

The cumulative impacts analysis area for paleontological and geological resources is the planning area. Since paleontological resources are nonrenewable, impacts are permanent. The affected environment description captures the cumulative impacts of past and present actions on paleontological and geological resources in the planning area. Impacts include destruction or loss of paleontological resources and unique geological features through ground disturbance associated with development projects and OHV use. Impacts also include the destruction or loss of paleontological resources and unique geological features from recreation use with associated [vandalism](#) or authorized and unauthorized collection of resources.

Reasonably foreseeable future actions with the potential to affect paleontological and geological resources are like past actions. In general, projects that result in increased development and recreational opportunities would increase the potential for cumulative impacts on paleontological resources and unique geological features and result in increased public access, which increases the potential for illegal fossil collection and vandalism. Cumulative effects on paleontological and geological resources from present and reasonably foreseeable actions (see **Appendix F**, Analytical Framework) could occur where these actions overlap areas with paleontological potential (for example, PFYC Classes 4 and 5) or areas with unique geological features. Any type of development projects would be expected to cause some surface disturbance and could impact paleontological resources, especially if they intersect geologic units with the potential to contain paleontological resources; this is because direct adverse impacts on paleontological and geological resources result from destruction due to surface-disturbing activities.



Actions that could contribute to cumulative impacts include road maintenance and improvement projects that could increase and improve access; buried pipelines, such as the Lake Powell Pipeline; various transmission projects, such as the Garkane Transmission ROWs, Arcadian ROW, and Navajo-McCullough Powerline ROW; and work within existing federal highway ROWs. Assessments and properly implemented mitigation, where applicable, would reduce or eliminate impacts on paleontological resources. In contrast, proposed paleontological excavations would beneficially affect paleontological resources by providing a mechanism for the recovery of paleontological resources in a manner that retains their scientific and educational value.

Impacts on paleontological and geological resources could also result from management decisions that increase public access and therefore increase the likelihood of the loss of paleontological resources and unique geological features through vandalism or unlawful collecting. Adverse, cumulative impacts could result from the incremental loss of paleontological resources, unique geological features, and the associated irretrievable loss of scientific information over time because of ground disturbance, vandalism, and both lawful and unlawful collection. Conversely, beneficial direct, indirect, and cumulative impacts on paleontological resources and unique geological features could result from management decisions that restrict surface-disturbing activities, close or limit travel and access, establish areas as special designations, conserve important specimens in publicly accessible museum collections, and inventory sites that facilitate mitigation and avoidance.

Under all alternatives, the BLM would evaluate paleontological resources and apply appropriate mitigation for any reasonably foreseeable projects within the decision area. Ongoing paleontological resources management within GSENM by the BLM's paleontology program provides baseline information through inventory, collection, and excavations that are used to evaluate and elevate cumulative impacts from management decisions. Additionally, outreach, education, and active site monitoring by the BLM's paleontology program also provide information and inform the public on mitigating impacts on paleontological resources and unique geological features.

### **3.9 FISH AND WILDLIFE**

The decision area supports complex and fragile ecosystems with fish and wildlife that have developed unique adaptations to the conditions of their environments. Typical of the Colorado Plateau, the highly diverse topography and vegetation of the decision area create important habitat for a range of invertebrate and vertebrate species, including mammals, fish, reptiles, amphibians, birds, and invertebrates.

The BLM works closely with the Utah Division of Wildlife Resources (UDWR) to manage habitat for fish and wildlife (including big game, upland game, waterfowl, migratory birds, small mammals, amphibians, mollusks, and reptiles) to achieve and maintain suitable habitat for desired population levels and distribution within the decision area. The UDWR is responsible for managing wildlife population levels for all fish and wildlife species, while the BLM is responsible for managing wildlife and fisheries habitat in a condition that will support desired levels of species. The BLM works cooperatively with the UDWR through habitat management and restoration to maintain and reestablish populations of species that have used the historic range within the decision area.

### 3.9.1 Affected Environment

#### Current Conditions

This section and Appendix I.9 discuss fish and wildlife resources, including special status species, and habitat in and around GSENM. The detail provided in Appendix I.9 includes a discussion of Birds of Conservation Concern (**Table 3-45**), big game habitats (**Table 3-46**, and **Table 3-47**), federally listed species (**Table 3-48**), and BLM sensitive species (**Table 3-49**). It also includes a discussion of regulatory frameworks for wildlife species, an overview of species observed in the area, ongoing surveys, and habitat connectivity present in GSENM and the region.

**Table 3-45. Birds of Conservation Concern That Have the Potential to Occur in GSENM**

| Species                | Scientific Name                   | Habitat                                   | Potential for Occurrence in GSENM <sup>11</sup>      |
|------------------------|-----------------------------------|---|--|
| Bald eagle             | <i>Haliaeetus leucocephalus</i>   | Large lakes and surrounding forests       | Common scavenger in winter; no nesting               |
| Clark's grebe          | <i>Aechmophorus clarkia</i>       | Large freshwater lakes and marshes        | Rare; common near Lake Powell, Wide Hollow Reservoir |
| Black rosy-finch       | <i>Leucosticte atrata</i>         | High-altitude mountains                   | Rare   |
| Black-chinned sparrow  | <i>Spizella atrogularis</i>       | Dry brushlands and chaparral              | Rare   |
| Cassin's finch         | <i>Carpodacus cassinii</i>        | Coniferous forests                        | Rare   |
| Evening grosbeak       | <i>Coccothraustes vespertinus</i> | Coniferous forests                        | Rare   |
| Grace's warbler        | <i>Dendroica graciae</i>          | Coniferous forests                        | Rare   |
| Lesser yellowlegs      | <i>Tringa flavipes</i>            | Marshes and wetlands                      | Very Rare  |
| Lewis's woodpecker     | <i>Melanerpes lewis</i>           | Ponderosa pine forests, higher elevations | Rare   |
| Long-eared owl         | <i>Asio otus</i>                  | Coniferous forests                        | Rare   |
| Olive-sided flycatcher | <i>Contopus cooperi</i>           | Boreal and coniferous forests             | Rare   |
| Pinyon jay             | <i>Gymnorhinus cyanocephalus</i>  | Pinyon-juniper woodlands                  | Common   |
| Virginia's warbler     | <i>Vermivora virginiae</i>        | Pinyon-juniper woodlands                  | Common   |

Source: USFWS 2022

**Table 3-46. Acres of Mule Deer Habitat within GSENM**

| Habitat               | Acres            |
|-----------------------|------------------|
| Summer crucial        | 126,500          |
| Summer substantial    | 17,400           |
| Winter crucial        | 852,600          |
| Winter substantial    | 224,000          |
| Year-long substantial | 18,400           |
| <b>Total</b>          | <b>1,239,100</b> |

Source: BLM GIS 2022

<sup>11</sup> Lisa Church, BLM Kanab Field Office, Paria River District wildlife biologist, personal communication on August 4, 2022, regarding bird species in the decision area.

**Table 3-47. Acres of Elk Habitat within GSENM**

| Habitat               | Acres          |
|-----------------------|----------------|
| Summer substantial    | 10,800         |
| Winter crucial        | 13,300         |
| Winter substantial    | 79,900         |
| Year-long substantial | 61,500         |
| <b>Total</b>          | <b>165,600</b> |

Source: BLM GIS 2022

Notes: Totals may not exactly equal the sum of the line items above due to rounding.

**Table 3-48. Federally Listed Species that Have the Potential to Occur in GSENM**

| Species                        | Scientific Name                   | Federal Status          | BLM Status        |
|--------------------------------|-----------------------------------|-------------------------|-------------------|
| Southwestern willow flycatcher | <i>Empidonax traillii extimus</i> | Endangered              | Sensitive species |
| California condor              | <i>Gymnogyps californianus</i>    | Experimental Population | Sensitive species |
| Mexican spotted owl            | <i>Strix occidentalis lucida</i>  | Threatened              | Sensitive species |
| Monarch butterfly              | <i>Danaus plexippus</i>           | Candidate               | Sensitive species |
| Western yellow-billed cuckoo   | <i>Coccyzus americanus</i>        | Threatened              | Sensitive species |

Source: USFWS 2023

**Table 3-49. BLM Sensitive Species Documented in or Potentially Occurring in the Decision Area**

| Species             | Scientific Name                  | BLM Status                     | State Status                   | Occurrence in GSENM  |
|---------------------|----------------------------------|--------------------------------|--------------------------------|--|
| <b>Birds</b>        |                                  |                                |                                |  |
| Northern goshawk    | <i>Accipiter gentilis</i>        | Conservation Agreement Species | Conservation Agreement Species | One confirmed territory in Mud Springs Canyon and one additional territory in Rock Creek/Mudholes; occasionally observed in winter in pinyon-juniper habitat |
| Golden eagle        | <i>Aquila chrysaetos</i>         | Sensitive Species              | Species of Concern             | Permanent resident in the decision area; commonly observed   |
| Burrowing owl       | <i>Athene cunicularia</i>        | Sensitive Species              | Species of Concern             | Documented in the Hole-in-the-Rock area and near Church Wells  |
| Short-eared owl     | <i>Asio flammeus</i>             | Sensitive Species              | Species of Concern             | Uncommon permanent resident in the decision area   |
| Ferruginous hawk    | <i>Buteo regalis</i>             | Sensitive Species              | Species of Concern             | Commonly observed during winter raptor surveys; two unoccupied historic nests on West Clark Bench  |
| Greater sage-grouse | <i>Centrocercus urophasianus</i> | Sensitive Species              | Species of Concern             | Uncommon winter resident; 5,800 acres of priority habitat management areas (winter habitat) in the Skutumpah/Glendale Bench area                             |
| Bald eagle          | <i>Haliaeetus leucocephalus</i>  | Sensitive Species              | Species of Concern             | Winter resident in the decision area; commonly seen during winter raptor surveys   |

3. Affected Environment and Environmental Consequences (Fish and Wildlife)

| Species                        | Scientific Name                         | BLM Status                     | State Status                   | Occurrence in GSENM   |
|--------------------------------|---|--------------------------------|--------------------------------|---|
| Lewis's woodpecker             | <i>Melanerpes lewis</i>                 | Sensitive Species              | Species of Concern             | Uncommonly observed in pinyon-juniper and oak habitats in the decision area   |
| <b>Mammals</b>                 |   |                                |                                |   |
| Townsend's big-eared bat       | <i>Corynorhinus townsendii</i>          | Sensitive Species              | Species of Concern             | Known to occur in the decision area   |
| Spotted bat                    | <i>Euderma maculatum</i>                | Sensitive Species              | Species of Concern             | Known to occur in the decision area   |
| Allen's big-eared bat          | <i>Idionycteris phyllotis</i>           | Sensitive Species              | Species of Concern             | Known to occur in the decision area   |
| Western red bat                | <i>Lasiurus blossevillii</i>            | Sensitive Species              | Species of Concern             | Potential habitat in the decision area  |
| Fringed myotis                 | <i>Myotis thysanodes</i>                | Sensitive Species              | Species of Concern             | Known to occur in the decision area   |
| Big free-tailed bat            | <i>Nyctinomops macrotis</i>             | Sensitive Species              | Species of Concern             | Confirmed in the decision area through mist net capture (BLM 2008b)   |
| <b>Insects</b>                 |   |                                |                                |   |
| Western bumble bee             | <i>Bombus occidentalis</i>              | Sensitive Species              | Species of Concern             | Known to occur in the decision area   |
| Monarch butterfly              | <i>Danaus plexippus</i>                 | Sensitive Species              | Species of Concern             | Known to occur in the decision area, although breeding habitat is likely limited  |
| <b>Amphibians</b>              |   |                                |                                |   |
| Arizona toad                   | <i>Bufo microscaphus</i>                | Sensitive Species              | Species of Concern             | Known to occur in the decision area (Oliver 2003), but has not been found in 5 years of surveys (Heyborne and Gardner 2021) |
| <b>Reptiles</b>                |   |                                |                                |   |
| Common chuckwalla              | <i>Sauromalus ater</i>                  | Sensitive Species              | Species of Concern             | Known to occur in the decision area (Oliver 2003), but has not been found in 5 years of surveys (Heyborne and Gardner 2021) |
| Desert night lizard            | <i>Xantusia vigilis</i>                 | Sensitive Species              | Species of Concern             | Known to occur in the decision area (Oliver 2003), but has not been found in 5 years of surveys (Heyborne and Gardner 2021) |
| <b>Fishes</b>                  |   |                                |                                |   |
| Bluehead sucker                | <i>Catostomus discobolus</i>            | Conservation Agreement Species | Conservation Agreement Species | Present in the Escalante River drainage   |
| Flannelmouth sucker            | <i>Catostomus latipinnis</i>            | Conservation Agreement Species | Conservation Agreement Species | Present in the Escalante River drainage   |
| Roundtail chub                 | <i>Gila robusta</i>                     | Conservation Agreement Species | Conservation Agreement Species | Present in the Escalante River drainage   |
| Colorado River cutthroat trout | <i>Oncorhynchus clarkia pleuriticus</i> | Conservation Agreement Species | Conservation Agreement Species | Present in the Escalante River drainage   |

Source: BLM 2019

### 3.9.2 Environmental Consequences

This section describes direct, indirect, and cumulative effects on fish, wildlife, and special status species from implementation of management direction under each alternative. Impacts on wildlife, fish, and special status species would primarily be associated with vegetation management, grazing, and recreational activities.

Refer to **Section F.14**, Fish and Wildlife, Including Special Status Wildlife, in **Appendix F**, Analytical Framework, for descriptions of the indicators, analysis areas, and assumptions used for the following analysis.

#### **Issue**

- How would proposed management affect wildlife, fisheries, and special status species resources?

#### **Impacts Common to All Alternatives**

##### *Impacts on Wildlife*

Impacts common to all alternatives include disturbance to wildlife species and possible abandonment or avoidance. These impacts would largely be associated with discretionary actions such as vegetation management, grazing, and recreational activities. Research has shown that wildlife responses to disturbances vary and can have detrimental effects such as altered behavior, reduced vigor, and reduced reproduction success, for example, from nest abandonment (Anderson 1995). If disturbances persist, many species may permanently avoid those areas. However, some species may adapt to disturbances over time and recolonize disturbed habitats. Disturbances are more likely to occur in easily accessible areas where human presence is high and in areas open to intensive motorized use. Permanent infrastructure such as roads, trails, parking lots, and campgrounds can disrupt movement patterns and migration routes for many wildlife species. Impacts also include the potential for injury or mortality to wildlife, specifically from vehicle collisions.

Under Alternatives B, C, D and E, the continued existence of structural and nonstructural range improvements would have impacts on many wildlife species. For example, water developments would provide water for many species such as birds and mammals, and vegetation projects would alter habitat conditions in the short-term with a goal of long-term improvement. However, adverse impacts would also continue, such as the fragmentation of habitat from fencing that could impede the movement of some wildlife species, like bighorn sheep and pronghorn. Localized ground disturbance, even on a small scale, may destroy habitat for ground-nesting endemic bees and other invertebrate pollinator species.

Under Alternatives B, C, D and E, water availability for native terrestrial species would be facilitated to offset the effects of drought or to disperse native terrestrial species to avoid disease outbreaks. This direction would vary by management areas and alternative; in the primitive area (Alternative C and Alternative E), and under Alternative D, only temporary (up to 6 months) supplemental water developments would be allowed. This management direction would benefit wildlife, like bighorn sheep, and habitats, though the duration of the benefit would differ across the alternatives.

Short-term noise (such as from vehicles and humans) has been documented to cause physiological effects for a variety of wildlife species, including increased heart rate, altered metabolism, and changes in hormone balance (Radle 2007). Impacts would be both short and long term, depending on the type and source of noise. These impacts are difficult to quantify, as different species and even individuals of the same species

can have varying responses to acoustic stimuli (Radle 2007; Barber et al. 2011). Sources of noise include a variety of recreational activities, such as OHV use, hiking, and recreational shooting, as well as other activities such as vegetation management and general management.

In general, impacts on special status species would be similar to those described for all wildlife species. Because there are limited data on known habitat locations for special status species in GSENM, impacts are discussed in generalized terms and are often included with non-special status species. However, because special status species often require specific habitat conditions that are generally not ubiquitous throughout GSENM and population numbers are typically low, impacts on these species may be disproportionately adverse. For example, all special status fish species are known only from the Escalante River drainage (**Table 3-49**), and the western yellow-billed cuckoo and southwestern willow flycatcher may also be seasonally present in the Escalante River corridor. Also, critical habitat for the southwestern willow flycatcher in the decision area is in the Paria River only. Discretionary actions that include surface-disturbing activities could directly impact these species by altering water quality and quantity. Because many of these species are not found in other river drainages, altered habitat suitability in the Escalante River or Paria River drainages could impact entire populations of these species. However, under all alternatives, specific management direction, such as avoidance of discretionary actions within 330 feet of riparian and wetland areas and project-level BMPs, would protect wildlife including special status species and critical habitat. Further, BMPs (**Appendix C**, see **Section C.4, Fish and Wildlife and Special Status Species**) would avoid or minimize effects on special status species. For example, these include seasonal limitations on disruptive activities near Mexican spotted owl and southwestern willow flycatcher habitat, and limitations on disruptive activities that could affect western yellow-billed cuckoo in riparian woodland areas.

#### *Impacts on Wildlife Habitat*

Discretionary actions across all alternatives serve as primary indicators of impacts on wildlife because these activities have the potential to impact wildlife habitat. Impacts on wildlife habitat would largely be associated with degradation, loss, and fragmentation. Fragmentation and degradation of wildlife habitats can reduce suitability and productivity, increase predation, and restrict seasonal or migratory routes that allow species to move from one area to another. Fragmentation and permanent loss of habitat can occur through the development of roads, trails, and infrastructure. Discretionary actions such as vegetation management, grazing, and recreation could impact wildlife by degrading vegetation communities through soil disturbance, trampling, plant removal, increased fugitive dust, and the introduction and spread of noxious and invasive weeds. Additionally, these uses can result in the loss of vegetation used for shelter and foraging, which supports a variety of species, and loss of ground nests for endemic bees. Trails, roads, and ROW development that could occur under each alternative would impact habitat by fragmenting the landscape and influencing habitat suitability for species that require large, contiguous habitats. Specific impacts on vegetation are discussed in **Section 3.3, Vegetation**.

Under all alternatives, surface-disturbing activities would impact habitat for many species. Impacts on soils could alter habitat suitability for species such as small mammals and insects that burrow, hibernate, or use underground areas to complete stage of their life cycles. For example, the *Diadasia* family of bees build their nests in hard soils in the GSENM region. Impacts from surface-disturbing activities therefore could impact habitat suitability for some species of these bees. Additionally, surface-disturbing activities can also alter vegetation composition that could impact birds, mammals, reptiles, and insects that rely on specific vegetative conditions for forage, nesting, or breeding.

Disturbances in riparian areas can cause erosion and sedimentation, bank destabilization, water quality degradation, and water quantity fluctuations, all of which can contribute to a reduction of aquatic ecosystem health. Impacts on water resources would affect a variety of wildlife species including fully aquatic species such as fish and terrestrial species that are reliant on water throughout their life cycles such as birds, mammals, insects, amphibians, and reptiles. Impacts from a variety of uses including recreational activities, vegetation management, and grazing can affect water resources. Specific impacts on water resources are discussed in **Section 3.4, Water Resources**.

In general, impacts on special status species habitat would be similar to those described for all wildlife species. However, as described in the *Affected Environment*, many special status species are directly linked to specific habitat types that may be limited within GSENM. For example, greater sage-grouse are sagebrush obligate species, requiring intact sagebrush communities for breeding, shelter, and forage. Within GSENM there are only 2,800 acres of Inter-Mountain Basins Montane Sagebrush Steppe (**Table 3-8**). Additionally, there are only 5,800 acres of greater sage-grouse priority habitat management area in GSENM. The priority habitat management area is further confined to the Skutumpah/Glendale Bench area of GSENM (BLM GIS 2022; **Figure 3-29, Appendix A**). Therefore, discretionary actions in sagebrush communities that impact small amounts of acreage may disproportionately impact sagebrush obligate species, such as greater sage-grouse.

Additionally, densely vegetated riparian systems required by the southwestern willow flycatcher are uncommon in GSENM, and only 1,100 acres of critical habitat for [southwestern willow flycatcher](#) overlap the decision area, in the Paria River drainage. [Similarly, the western yellow-billed cuckoo is expected to occur in the decision area in the Escalante River.](#) Therefore, even relatively small impacts on this habitat could result in a large percentage of suitable habitat becoming lost or degraded, or a loss of function of designated critical habitat. Because many species utilize riparian systems, impacts on these habitats would impact a variety of wildlife. Because special status species often require habitat components that are more restrictive than general wildlife species, impacts on these habitats can have greater impacts on special status species.

The introduction and spread of nonnative plant species can disrupt the symbiotic relationships between pollinators and their host plants. Many pollinators, including the monarch butterfly (*Danaus plexippus*) and many bee species, are reliant on specific plant hosts for food or reproduction. These relationships make them less adaptable to a reduction in the host plants' population or changes in its distribution. In addition, many plants species have evolved to be dependent on specific pollinators and may not survive without them.

Many goals, objectives, management directions, and allocations for wildlife and fish would remain the same or similar under all alternatives. These directives provide protection for wildlife and their habitats while allowing for other discretionary [actions](#). Management direction for all alternatives include limiting discretionary [actions](#) to protect and recover special status species (BLM Utah listed sensitive; federally listed threatened, endangered, proposed, or candidate plant, animal, and fish species) habitats and populations. Seasonal closures would protect special status raptor species like golden eagle, peregrine falcon, and Swainson's hawk, and special status riparian birds like yellow-billed cuckoo and southwestern willow flycatcher. Group size limits would be established in Mexican spotted owl protected activity centers. [The BLM would also](#) implement the relevant decisions from the [operative](#) Greater Sage-Grouse

[RMP Amendments](#)<sup>12</sup> applicable to habitat. Surface-disturbing activities would be avoided or prohibited within 0.5 miles of occupied California condor roosts. Additionally, protection of other resources often has an incidental, beneficial impact of protecting wildlife, fish, and special status species habitat. For example, vegetation management including prescribed burns, habitat maintenance and restoration, and removal of noxious and invasive species have the greatest potential to improve existing conditions, even if their primary function is not related to wildlife. These treatments could reduce soil loss, improve wildlife habitat, restore ecological function, and increase available forage. Additionally, the protection of cultural or paleontological sites could benefit wildlife and habitats if these areas overlap.

Other management directions that would benefit wildlife include protecting important migration and movement corridors throughout GSENM for both aquatic and terrestrial species. Under all alternatives, a 21,112-acre seasonal avoidance area would be established along the U.S. Highway 89 corridor. This corridor would restrict uses during the winter to allow the Paunsaugunt mule deer herd to migrate south into Arizona for winter (Messmer and Klimack 1999). Other designations, such as WSAs, would also limit discretionary actions (for example, recreation and OHV use) and protect wildlife habitat from surface disturbances that could alter soil, vegetation, and water resources that degrade wildlife and fish habitat and displace wildlife. Management of WSAs would be the same under all alternatives. Recreational management areas including SRMAs, ERMAs, and RMZs would occur under all alternatives, although acreage would vary. In RMAs, rules and guidelines would limit or control activities through specialized management tools such as designated campsites, permits, area closures, and limitations on user numbers and duration of use. Generally, these limitations would benefit wildlife and their habitats by restricting the number of visitors and activities that could cause habitat degradation. Specific prescriptions for RMAs are included in **Appendix E**, Recreation Management Areas.

Additional [BMPs](#) as described in **Appendix C**, [Best Management Practices](#), would protect wildlife, fish, and special status species habitat. Specific BMPs are included for the southwestern willow flycatcher, yellow-billed cuckoo, Mexican spotted owl, California condor, and bald eagle. Other BMPs are included for general wildlife and fish species. These BMPs would be implemented on a project-by-project basis.

### **Alternative A**

Alternative A generally allows for maximum discretionary [actions](#), including livestock grazing, and emphasizes management flexibility while still providing for resource protection as required by applicable laws and regulations, including the protection of GSENM objects. Under Alternative A, it is likely that current trends pertaining to wildlife and habitat would continue as described under *Affected Environment*.

General management activities that would impact wildlife under Alternative A include retaining the No Mans Mesa RNA (ACEC), which would prohibit livestock grazing, OHV use, and campfires within the area. These management directions would reduce impacts on wildlife and habitats by removing competition between livestock and wildlife and limiting disturbances from OHV use. However, No Mans Mesa RNA (ACEC) is only 1,500 acres and, therefore, provides protection to a small fraction of the overall acreage of GSENM. Additionally, under Alternative A, lands with wilderness characteristics would not be managed for those characteristics. Therefore, wildlife and habitats would be vulnerable to impacts in these areas.

---

<sup>12</sup> The Greater Sage-Grouse RMPs are currently being amended, and thus whatever the most current operative plan is would apply to how Greater Sage-grouse habitat is managed within GSENM per the GSENM Approved RMP.



Additional management directions include avoidance measures for new ROWs and communication sites in special status wildlife species habitat and adding applicable buffers where suitable alternatives exist. Although transmission and power line construction does not generally result in substantial direct habitat loss, it would temporarily disturb wildlife species in habitat along the ROW due to the associated human activity, equipment, and noise, and would contribute to habitat fragmentation. In addition, transmission lines can provide perches and nest sites for predators such as ravens and raptors, resulting in indirect negative impacts on prey species. Roads associated with ROWs can also reduce the extent and quality of habitat or serve as inroads for invasive plants to establish, further reducing habitat quality.

#### *Impacts on Wildlife*

Under Alternative A, all methods and tools would be available for vegetation management. These treatments would be prioritized to improve rangeland health and wildlife habitat. The current focus has included spot treatments for noxious weeds, preemergent herbicide application prior to seeding (targeting cheatgrass), mastication (mulching), harrowing and seeding, prescribed fire, and follow-up seeding post-treatment. **Appendix I, Table I-10** summarizes past vegetation management; these trends in vegetation management, which focus on seeding, would continue under Alternative A. Vegetation management could have short-term impacts on wildlife by causing species to avoid areas during and immediately after treatment activities. For example, human presence associated with the removal of noxious and invasive species would likely alter wildlife activity in treatment vicinity. Specifically, with the California Condor, surface use or disruptive activities would be allowable within 0.5 miles of occupied California condor roosts or 1 mile of occupied nests, if the activity is consistent and compatible with protection, maintenance, or enhancement of the habitat and populations, or if the activity is relocated or redesigned to eliminate or reduce detrimental impacts. For the western yellow-billed cuckoo, surface disturbing activities within occupied breeding habitat between June 1<sup>st</sup> and August 31<sup>st</sup>, and April 15<sup>th</sup> and August 15<sup>th</sup> for southwestern willow flycatcher, would be allowed if site specific analysis and consultation with the USFWS is determined that the activity would not adversely affect either species or habitat. For aquatic species and habitat, the management direction would be to avoid surface disturbing activities within 330 feet of special status fish species habitat. The exceptions to this would be 1) if the impacts from the proposed action can be adequately mitigated, or 2) the action will benefit the species and/ or habitat, and 3) after a site-specific analysis and consultation with the USFWS. Additionally, most wildlife, including special status wildlife species, would disperse from areas during prescribed burns and potentially avoid these areas for some time afterward until vegetation reestablishes enough to provide forage and shelter. Aquatic species could also be impacted by the removal of vegetation, which can increase erosion and increase sedimentation in aquatic environments.

Under Alternative A, nearly all allotments within GSENM would continue to be available for livestock grazing. Approximately 2,117,300 acres of the livestock planning area that includes both GSENM and Glen Canyon would be available for livestock grazing (see **Table 2-1**) and 107,995 AUMS would be allocated. Livestock grazing can directly impact wildlife species through competition and avoidance of areas where livestock are present. Species have differing responses to the presence of livestock, and species that are directly dependent on vegetation—such as herbivores and pollinators—have the greatest response to livestock grazing (Filazzola et al. 2020). Although grazing would be available on the majority of GSENM, not all allotments would have livestock and not all portions of allotments are suitable for livestock grazing. Many areas that have bare ground, rock, or steep slopes would generally be avoided by livestock, although these areas also do not provide habitat characteristics that provide for wildlife diversity. Typically, livestock congregate in areas that provide forage, shade and water, all of which are important to wildlife species.

Direct competition for these resources would occur mainly between livestock and big game species such as pronghorn and mule deer. Of the 1,228,500 acres of mule deer habitat, 1,199,800 acres, **or about 98 percent of habitat (BLM GIS 2022)**, would overlap available allotments under Alternative A. Specifically, only **28,700** acres of winter mule deer habitat, **or about 2 percent of total habitat**, would be unavailable for livestock grazing (BLM GIS 2022), meaning competition for forage during the winter, when resources are less abundant, would occur within the majority of GSENM.

Available allotments under Alternative A overlap small portions of both greater sage-grouse priority habitat management areas and southwestern willow flycatcher **critical** habitat. Over 436,300 acres overlap Mexican spotted owl critical habitat, and 5,300 acres overlap Mexican spotted owl protected activity centers (BLM GIS 2022). Cattle grazing has been shown to reduce rodent species richness and abundance and the abundance of woodrats (*Neotoma* spp.) specifically; woodrats are the primary prey species for Mexican spotted owl within riparian corridors (Willey 2007). However, because not all areas of allotments are used by cattle, only portions of allotments may overlap Mexican spotted owl foraging habitat.

Under Alternative A, grazing of domestic sheep and goats would be considered within GSENM. Consideration would also be given to using domestic sheep and goats as pack animals. Disease transmission from domestic livestock to wild, bighorn sheep can be devastating to populations since they typically do not have immunity to diseases associated with domestic livestock (USGS 2017). Although effective physical separation of domestic sheep and goats and wild sheep would be required, allowing sheep and goat grazing under this alternative could increase the possibility of disease transmission between domestic sheep and goats and bighorn sheep.

Recreation in GSENM has increased substantially in recent years and will likely continue to increase. Many recreational activities, including hiking, hunting, OHV use, and camping, have the potential for adverse short- and long-term impacts on fish and wildlife, such as disturbance and displacement. Under Alternative A, five SRMAs, two ERMAs, and 10 RMZs would continue being managed as such. These RMAs would cover the entirety of GSENM and establish specific management direction that would limit certain recreational uses that could benefit wildlife. These restrictions, such as group size limits and camping and campfire limitations, would reduce impacts on many wildlife species including special status species.

Under Alternative A, OHV use would continue to be limited to designated routes on **1,864,000** acres (**nearly the entirety of GSENM**). Within these areas, OHV use **on designated routes** would impact wildlife through disturbance and avoidance. Additionally, vehicle/wildlife collisions could cause injury or mortality to a variety of species, but particularly to small mammals, birds, and reptiles. Mule deer are common throughout GSENM and are, therefore, frequent subjects of vehicle collisions. A report from 2014 cited that, on average, there are 132 mule deer–vehicle collisions along U.S. Highway 89 between Kanab, Utah, and the Arizona state line **annually** (Utah Department of Transportation 2014). Approximately **1,237,500** acres of OHV limited areas would overlap mule deer habitat (BLM GIS 2022), meaning a large portion of GSENM would have potential for vehicle/mule deer collisions. With expected increases in visitation, these potential vehicle/wildlife collisions would also increase.

There are 440,900 acres where OHVs would be limited to designated routes that would overlap Mexican spotted owl critical habitat and 5,300 acres that would overlap protected activity centers. Smaller overlaps of OHV limited areas occur for greater sage-grouse habitat management areas and southwestern willow flycatcher critical habitat (5,800 acres and 1,100 acres, respectively; BLM GIS 2022). Impacts from noise and vehicles could cause disturbances to these species, especially if routes within these areas are used

frequently. Because most avian species, including these special status species, are more susceptible to noise and human occupancy during the breeding season, if routes within these overlapping areas are used during the nesting season, impacts such as nest abandonment or reduced offspring survival could occur. Noise from OHV use during the winter could also disturb greater sage-grouse using the 5,800 acres of habitat management areas in GSENM. Disturbance can affect winter habitat selection and cause habitat avoidance (State of Utah 2019).

Development and maintenance of recreation and administrative facilities that are within Mexican spotted owl habitat would be allowed under two conditions. 1) if the activity is consistent and compatible with protection, maintenance, or enhancement of the habitat and populations or 2) if the activity is relocated or redesigned to eliminate or reduce detrimental impacts.

Under Alternative A, the majority of GSENM would be open to recreational shooting, which is only prohibited within a 0.25-mile buffer of residences, campgrounds, and developed recreation facilities. Recreational shooting could cause wildlife to avoid areas during use due to noise and human presence. If recreational shooting areas are used consistently, there is potential that some wildlife species may permanently avoid these areas. Additionally, the use of lead ammunition can result in unintentional exposure and be fatal for some wildlife species (Quy 2010).

#### *Impacts on Wildlife Habitat*

Under Alternative A, all methods and tools would continue to be available for vegetation management. These treatments would continue to be prioritized to remove woodland products to improve rangeland health and wildlife habitat. The current focus has included spot treatments for noxious weeds, preemergent herbicide application prior to seeding (targeting cheatgrass), harrowing and seeding, prescribed fire, and follow-up seeding post-treatment. Appendix I, Table I-10 summarizes past vegetation management; these trends in vegetation management with a focus on seeding would continue under Alternative A. In the short term, these treatments may alter habitat characteristics such that they are no longer suitable for some species. For example, use of prescribed fire to reduce nonnative annual grasses or woody vegetation would reduce cover that provides shelter and alters insect populations that provide forage for small mammals, birds, and reptiles. However, over the long term, these treatments would improve wildlife habitat by restoring natural conditions and increasing forage. Specifically, big game species such as elk, mule deer, and pronghorn would benefit from the removal of woody species that would allow perennial grasses and forbs to establish and provide forage. Other species that rely on grassland habitats, such as migratory birds, pollinators, and small mammals, would also benefit from these treatments.

Under Alternative A, no preference would be given to the use of native seeds during restoration. Species that rely on native plants for shelter or forage could be impacted if vegetation management remove native species and these species are not used during restoration. As described under *Impacts Common to All Alternatives*, the removal or decrease of native plant species could impact pollinator species disproportionately if the host plants' population is reduced or lost.

Alternative A would continue to provide the most acreage and AUMs for livestock grazing across all alternatives. Impacts on wildlife habitat can occur through livestock grazing and surface disturbance from range improvements. These impacts can damage and alter sensitive riparian areas if fencing is not properly installed and maintained. Impacts on soil by improper distribution can cause soil compaction, which can

alter the ability of vegetative species to grow and result in bare ground. Additionally, as discussed in **Section 3.5.1**, disturbed habitats have high levels of plant invasions related to the destruction of soil crusts and local displacement of native species by invasive species (Stohlgren et al. 2005).

Under Alternative A, 531,400 acres of bighorn sheep habitat and 1,199,800 acres of mule deer habitat overlap acres available for livestock grazing. Additionally, 5,800 acres overlap greater sage-grouse habitat priority areas, 436,300 acres overlap Mexican spotted owl critical habitat, and 1,100 acres overlap southwestern willow flycatcher critical habitat. As described above, grazing in these areas could lead to habitat becoming unsuitable for these species as well as others. [Greater sage-grouse requires specific habitat characteristics throughout their life cycles and overgrazing and improperly managed grazing may impact habitat.](#) Because southwestern willow flycatcher habitat is closely associated with riparian systems and livestock require access to water, the areas of critical habitat that overlap grazing areas could become unsuitable if grazing alters the riparian ecosystems.

Recreational use is likely to continue to increase within GSENM, which increases the potential for impacts on wildlife habitat. As described in *Impacts Common to All Alternatives*, these impacts would largely be associated with habitat degradation and fragmentation through OHV use. Alternative A would retain the Little Desert RMZ as an OHV open area, with the majority of the remaining acreage continuing to be managed as OHV limited. Only No Mans Mesa RNA (ACEC) would be managed as closed to OHV use, which overlaps with 1,500 acres of mule deer habitat but no acres of bighorn sheep habitat (BLM GIS 2022). All routes in OHV limited and open areas could impact habitat connectivity if they are used frequently. In OHV limited areas, vehicular travel would be allowed only on designated routes, and impacts on soil, water, and vegetation resources that could affect habitat suitability would be limited to the designated routes. Species that require large home ranges, such as mule deer, bighorn sheep, black bear, and some avian species, could have those ranges or habitats fragmented by these routes.

Alternative A would designate RMAs including ERMAs, SRMAs, and RMZs throughout the entirety of GSENM. Within RMAs, rules and guidelines limit or control recreational activities through specialized management prescriptions such as designated campsites, permits, area closures, limitations on number of users, and duration of use. (**Appendix E**, Recreation Management Areas). Because each RMA would have different management prescriptions and wildlife habitats do not align with RMA boundaries, beneficial and adverse impacts on wildlife habitat from the designation of RMAs are difficult to categorize. In some instances, RMA prescriptions may be used to concentrate recreational users into specific areas, thereby concentrating [impacts on](#) these areas and reducing impacts in others. However, wildlife habitats in areas where recreational use is concentrated may be disproportionately affected, and habitat suitability for some species could decline or habitats become unsuitable. Impacts on wildlife habitat within RMAs from recreational use would occur; however, the rules and guidelines associated with RMAs are designed to reduce impacts recreational use would have on all GSENM objects, including wildlife and their associated habitats.

### **Alternative B**

Alternative B emphasizes flexibility in planning-level direction to maximize the potential for an array of discretionary actions that are compatible with the protection of GSENM objects. Due to the allowance of discretionary actions under Alternative B it is likely that there would be similar impacts on wildlife and habitats to Alternative A. However, due to management direction under Alternative B, impacts would be expected to be slightly reduced, compared with Alternative A. [This is because the management direction](#)

under this alternative would avoid adverse impacts on aquatic, avian, and terrestrial species habitat, connectivity, and movement. Additionally, where adverse impacts cannot be avoided, project design features would reduce loss of native habitat, connectivity, and movement corridors. Construction of aquatic barriers would be permitted if the benefit of nonnative species control and native species protection is greater than the loss in connectivity. These management directions would also apply to special status wildlife species, and habitat. For aquatic habitat, the management direction would be to prohibit the use of chemical substances that may affect the Colorado pikeminnow or the razorback sucker downstream habitat.

In areas where critical habitat is designated and contains the physical and biological features necessary for listed species, ROWs would be classified as avoidance. The only exception would be in areas that are identified as open for ROW location, see **Section 3.18 Lands and Realty**.

Alternative B would designate two ACECs and four RNAs (ACECs) (**Table 2-1**). These areas, similar to WSAs and lands with wilderness characteristics, would restrict uses associated with recreation and other discretionary actions that would likely benefit wildlife by reducing disturbances that would cause avoidance and minimizing uses that would degrade or fragment habitat. Management of lands with wilderness characteristics under Alternative B would be similar to the management under Alternative A. Under Alternative B, there would be 72,000 acres of lands with wilderness characteristics that would be managed to protect wilderness characteristics compared with no acres under Alternative A. While this increase in acres of lands with wilderness characteristics managed to protect those characteristics would likely protect wildlife habitats from degradation and fragmentation, restrictions in these areas may also limit the ability of management to use all available types of vegetation management; therefore, they may be forced to use more passive and less productive tools and methods. *Under this alternative, new supplemental water developments for native wildlife species, including special status wildlife species, would be permitted. In WSAs these water developments would be permitted only if the design of the water development does not reduce the wilderness characteristics or enhance resources for which the WSA was designated.*

#### *Impacts on Wildlife*

Vegetation management actions under Alternative B would be similar to those described under Alternative A. Both alternatives would focus on improving vegetation communities at the watershed level. Alternative B would prioritize the use of native vegetation, while still allowing the use of nonnative species in certain instances. Limiting the use of nonnative species would reduce the potential of nonnative species outcompeting and reducing habitat for native species. Under both alternatives, landscape-scale restoration projects have the potential to disrupt and disturb wildlife over a broader area and, therefore, impact more individuals and populations. In the short term, species that are less mobile may succumb to injury or mortality during these activities. In the long term, species with small home ranges may have their habitat degraded or completely lost. *With California condor, the management direction under this alternative, would avoid surface use or activities that are known to cause disturbances to nesting raptors within 0.5 miles of occupied condor roosts, or 1 mile of occupied nests. For the western yellow-billed cuckoo and southwestern flycatcher, the management direction would be to avoid habitat altering activities within occupied habitat during the primary breeding/ nesting season (April 1<sup>st</sup> through July 1<sup>st</sup>).*

Under Alternative B, in addition to the allotments that are unavailable under Alternative A, allotments that do not have a current grazing permit would become unavailable for livestock grazing. This would result in *approximately 75,200 fewer* acres available for grazing (**Table 2-1**) and reduce AUMs by 2,961.

Compared with Alternative A, the reduction in AUMs and acres available for livestock grazing under Alternative B would reduce competition between livestock and wildlife as well as limit impacts on species associated with habitats used by livestock. Under Alternative B, 2,042,100 acres (75,200 fewer acres than under Alternative A) would be available for livestock grazing in the livestock planning area (BLM GIS 2022). Compared with Alternative A, this would reduce direct competition mule deer and other ungulates such as pronghorn. Other species such as small mammals, pollinators, and many migratory birds that rely on grasslands for forage and shelter would also benefit from the reduction in allotment availability and AUMs. Additionally, reduction of livestock grazing would beneficially affect the availability of naturally occurring water sources (e.g., springs) for use by wildlife.

Allotments available under Alternative B that overlap special status species habitat would not vary substantially from Alternative A. Therefore, impacts on these species would be similar for this alternative compared with Alternative A.

Under Alternative B, grazing and use of domestic sheep and goats as pack animals would be allowed within GSENM. Although effective physical separation would be required between domestic sheep and goats and bighorn sheep, the lack of a prohibition on sheep and goat grazing and as pack animals under this alternative could increase the possibility of disease transmission between domestic sheep and goats and bighorn sheep.

Under Alternative B, 1,770,100 acres would be designated as ERMs (27,600 fewer acres than under Alternative A), while 95,300 acres would be designated as SRMs (2,300 fewer acres than under Alternative A). Therefore, impacts on wildlife from the designation of RMs would be similar to Alternative A. Because these acres are similar and management of RMs are similar for these alternatives, it is expected that impacts on these species would be similar to those under Alternative A.

Alternative B would close the only OHV open area that would be open under Alternative A, a portion of the Little Desert RMZ. This closure would likely have little impact on wildlife because the area is only 2,500 acres, and only 100 acres of that is open to cross-country OHV travel.

Under Alternative B, OHV use would be limited to designated routes on 913,600 acres (about 49 percent of GSENM), and 952,000 acres (51 percent of GSENM) would be closed to OHV use. However, the number of miles of existing routes that would be open to OHV use under Alternative B, would be the same as under Alternative A (921 miles; BLM GIS 2022). As a result, most effects on wildlife from OHV use would be the same as under Alternative A.

Under Alternative B, 623,400 acres of OHV closed routes would overlap mule deer habitat. Additionally, 282,900 acres managed as closed to OHV use would overlap Mexican spotted owl critical habitat and 5,100 acres would overlap protected activity centers. A smaller overlap of OHV closed acreage would occur for southwestern willow flycatcher critical habitat (400 acres; BLM GIS 2022). However, because the overall number of miles of existing routes that would be open to OHV use under Alternative B, would be the same as under Alternative A, most effects on wildlife from OHV use would be the same as under Alternative A.

Development and maintenance of recreation and administrative facilities that are within Mexican spotted owl habitat would be authorized under two conditions. 1) if the activity is consistent and compatible with protection, maintenance, or enhancement of the habitat and populations or 2) if the activity is relocated

or redesigned to eliminate or reduce detrimental impacts. Additionally, groups sizes are limited to 12 and overnight camping is prohibited in Mexican spotted owl protected activity centers during the breeding/nesting season (March 1 to August 31). Canyoneering or rappelling within protected activity centers during the breeding/nesting season (March 1 to August 31) requires that participants stay within the canyon bottom and not enter or exit the canyon via canyon walls or other areas that could possibly disrupt breeding/nesting MSO.

Under Alternative B, recreational shooting would be allowed on 951,500 acres, 905,300 fewer acres compared with Alternative A. This would come from prohibiting recreational shooting acreage in RNAs (ACECs) and WSAs/ISAs. This reduction of acres available for recreational shooting would reduce noise and human presence associated with recreational shooting and, therefore, reduce disturbance to wildlife and avoidance of areas. Additionally, the increase in acreage where recreational shooting would be prohibited would reduce the unintentional wildlife exposure to lead ammunition.

#### *Impacts on Wildlife Habitat*

Vegetation management under Alternative B would be similar to those described under Alternative A, there would be the potential for large landscape-scale restoration projects. Compared with Alternative A, these restoration projects have the potential to alter habitat suitability across larger portions of the landscape. Therefore, in the short term, these projects could reduce or eliminate vegetation or habitat characteristics (for example, downed logs, snags, and woody debris) that provide forage, shelter, and breeding areas. However, these treatments would have a larger long-term beneficial impact by improving habitat over a larger area and potentially improving habitat connectivity.

Compared with Alternative A, Alternative B would prioritize the use of native vegetation for all vegetation management efforts. However, certain stipulations, such as site-specific conditions and accordance with BLM policy, would allow the use of nonnative vegetation as long as the seeding leads towards a native vegetation community. This distinction is important because it allows management to conduct vegetation management that may be high priority and immediately necessary even if native seed is unavailable.

Under Alternative B, in addition to the allotments that would be unavailable under Alternative A, allotments that do not have a current grazing permit would become unavailable for livestock grazing. Under Alternative B, 2,042,100 acres would be available for grazing, 75,200 fewer acres in the livestock planning area (Table 2-1) and 2,961 fewer AUMs than Alternative A. Compared with Alternative A, Alternative B's reduction in AUMs and acres available for livestock grazing would reduce the potential for surface disturbance through livestock grazing and result in range improvements. However, because this reduction in acres and AUMs is relatively small, there likely would not be a substantial benefit to wildlife habitat compared with Alternative A. Additionally, overlap of mule deer, bighorn sheep, and special status species habitats would be similar to Alternative A, and impacts would be expected to be similar compared with Alternative A. Additionally, the reduction of livestock grazing would meaningfully, beneficially affect the availability of naturally occurring water sources (e.g., springs) for use by wildlife.

Under Alternative B, 1,770,100 acres would be designated as ERMA (27,600 fewer acres than under Alternative A), while 95,300 acres would be designated as SRMA (2,300 fewer acres than under Alternative A). Because RMAs would cover similar areas of GSENM in Alternatives A and B, overlap of RMAs and mule deer habitat, bighorn sheep habitat, and special status species habitat would be similar. Therefore, impacts on wildlife habitat from the designation of RMAs would be similar to Alternative A.

Because each RMA would have different management prescriptions, and wildlife habitats do not align with RMA boundaries, beneficial and adverse impacts on wildlife habitat from the designation of RMAs is difficult to categorize. Impacts on wildlife habitat within RMAs from recreational use would occur; however, the rules and guidelines associated with RMAs are designed to reduce impacts recreational use would have on all GSENM objects, including wildlife and associated habitat.

### **Alternative C**

Alternative C would emphasize the protection of intact and resilient landscapes using an area management approach to allow for discretionary [actions](#) in appropriate settings. Four management areas would be established: front country, passage, outback, and primitive. These areas would be used to identify allowable uses that meet the area's goals and objectives while also protecting GSENM objects. Under Alternative C, more protection in the primitive area would likely reduce impacts on wildlife and habitat compared with Alternative A. The front country, passage, and outback areas would allow for more discretionary [actions](#) and, therefore, likely impact wildlife and habitat similar to those under Alternative A.

Management direction under Alternative C is the same as Alternative B in regard to the avoidance of adverse impacts on aquatic, avian, and terrestrial species habitat, connectivity, and movement. Additionally, where adverse impacts cannot be avoided, project design features would reduce loss of native habitat, connectivity, and movement corridors. Additionally, management activities would focus on maintaining and restoring habitat connectivity, including habitat for special status wildlife species. Construction of aquatic barriers would be permitted if the benefit of nonnative species control and native species protection is greater than the loss in connectivity. For aquatic habitat, the management direction on chemical use would be the same as described under Alternative B.

The management direction under this alternative for ROWs would be the same as described under Alternative B.

New water developments in the front country, passage, and outback country areas would be permitted to supplement water to native wildlife species if they were designed to be consistent with the protection of GSENM objects. In areas the management directions for new water developments would be the same as described under Alternative D.

Alternative C would designate [two RNAs \(ACECs\)](#), [similar to Alternatives B, and E](#), compared with one RNA (ACEC) under Alternative A (**Table 2-1** in **Chapter 2**). Alternative C would also include protective measures for 190,100 acres of lands with wilderness characteristics. These areas, similar to WSAs, would restrict uses such as recreation that would likely benefit wildlife by reducing disturbances that would cause avoidance and minimizing discretionary actions that would degrade or fragment habitat. However, these areas may restrict some types of vegetation management that could improve wildlife habitat.

### *Impacts on Wildlife*

Vegetation management [in the newly established management areas](#) under Alternative C, would emphasize active restoration in the [front country, passage, and outback](#) areas, while focusing on passive restoration in the [primitive area](#). The management direction in the [front country, passage and outback](#) areas would be the same as described under Alternative B, while the management direction in the [primitive areas](#) would be the same as described under Alternative D. Impacts from restoration activities on wildlife [including special status wildlife species](#), such as avoidance and disturbance, would be similar in the [front](#)



country, passage, and outback areas as Alternative A and B. Because passive restoration would be prioritized in the primitive area, this area would have reduced impacts from Alternative A. Because this area makes up the majority of GSENM, overall impacts on wildlife, including special status wildlife species, from vegetation management activities would be reduced under Alternative C, compared with Alternative A. The management direction for the California condor would be the same as described under Alternative B. For the western yellow-billed cuckoo and southwestern flycatcher, the management direction would be the same as described under Alternative B.

Under Alternative C, (similar to Alternative B) in addition to the allotments that are unavailable under Alternative A, allotments that do not have a current grazing permit would become unavailable for livestock grazing. This would result in approximately 75,200 fewer acres available for grazing in the livestock planning area (Table 2-1) and reduce AUMs by 10,821. Compared with Alternative A, the reduction in AUMs and acres available for livestock grazing under Alternative C would reduce competition between livestock and wildlife as well as limit impacts on species associated with habitats used by livestock. Specifically, big game species that directly compete with livestock for forage would benefit from the reduction in livestock grazing under this alternative. Ungulates, such as pronghorn, and other species, such as small mammals, pollinators, and many migratory birds that rely on grasslands for forage and shelter, would also benefit from the reduction in allotment availability and AUMs. Additionally, reduction of livestock grazing would beneficially affect the availability of naturally occurring water sources (e.g., springs) for use by wildlife.

Allotments available under Alternative C that overlap special status species habitat would not vary dramatically from Alternative A. Therefore, impacts on these species would be similar for Alternative C.

Under Alternative C, grazing of domestic sheep and goats would be prohibited within GSENM. Additionally, domestic sheep and goats would only be allowed as pack animals outside of occupied desert bighorn sheep habitat. This prohibition and restriction would effectively eliminate the potential for disease transmission between domestic sheep and goats and bighorn sheep.

Under Alternative C, 486,300 acres would be designated as ERMA (more than 1.3 million fewer acres than under Alternative A) and 417,400 acres (349,800 more acres than under Alternative A) as SRMA (Table 2-1). This decrease in ERMA and increase in SRMA compared with Alternative A could lead to more impacts on wildlife. With fewer restrictions on recreation, there is potential that larger group sizes, fewer restrictions on camping and campfires, and the development of facilities could lead to an increase of disturbance and avoidance of certain areas compared with Alternative A.

Generally, recreation management for the front country, passage, and outback areas would be less limiting while management for the primitive area would be more restrictive. For example, competitive events would be prohibited in the primitive area, and restrictions on camping and campfires would be in place. In contrast, in the front country, passage, and outback areas, group size limits and stock animal limits would decrease. Similar to the RMA designations, these area prescriptions would concentrate recreational uses in specific areas while limiting them in others. Therefore, impacts on wildlife-associated recreational uses such as hiking and camping would be reduced in the primitive area and increased in the front country, passage, and outback areas.

Alternative C would close the only OHV open area that would be open under Alternative A, a portion of the Little Desert RMZ. This closure would likely have little impact on wildlife because the area is only 2,500 acres, and only 100 acres are open to cross-country OHV travel.

Under Alternative C, OHV use would be limited to designated routes on 656,100 acres (about 35 percent of GSENM), and 1,209,500 acres (65 percent of GSENM) would be closed to OHV use. However, the number of miles of existing routes that would be open to OHV use under Alternative C, would be nearly the same as under Alternative A (913 miles, 7 fewer miles; BLM GIS 2022). As a result, most effects on wildlife from OHV use would be the same as under Alternative A.

Alternative C would close to OHV use 624,100 acres that overlap mule deer habitat and 389,600 acres that overlap bighorn sheep habitat (BLM GIS 2022). Approximately 324,500 acres of OHV closed areas would overlap Mexican spotted owl critical habitat and 5,200 acres would overlap protected activity centers. A smaller overlap of OHV closed areas would occur for southwestern willow flycatcher critical habitat, 400 acres (BLM GIS 2022). However, because the overall number of miles of existing routes that would be open to OHV use under Alternative C, would be nearly the same as under Alternative A, most effects on wildlife from OHV use would be the same as under Alternative A.

Development and maintenance of recreation and administrative facilities in the front country and passage areas that overlap with Mexican spotted owl habitat would be as described as under Alternative B. Development and maintenance of recreation and administrative facilities in the outback and primitive areas that overlap with Mexican spotted owl habitat would be as described as under Alternative D. Additional management directions such as group sizes for overnight camping, canyoneering, and rappelling within protected activity centers for Mexican spotted owl would be as described under alternative B.

Under Alternative C, recreational shooting would be allowed on 697,600 acres, 1,159,200 fewer acres compared with Alternative A (Table 2-1), as a result of prohibiting recreational shooting in the front country and primitive areas. This reduction of acres available for recreational shooting would reduce noise and human presence and, therefore, reduce disturbance and avoidance to wildlife. Additionally, this increase in acreage where recreational shooting would be prohibited would reduce the unintentional exposure wildlife to lead ammunition.

#### *Impacts on Wildlife Habitat*

The types of effects on wildlife habitat from vegetation management under Alternative C would be similar to those described for Alternative A, however, vegetation management would be limited to passive methods in the primitive area under Alternative C, which comprises most of the GSENM. The prioritization of natural processes may limit the amount of restoration projects, methods, and techniques that would be available under Alternative C. The reliance on passive management could increase the spread of noxious and invasive species if certain tools and techniques were not authorized for use. Studies have shown that in some circumstances, such as after wildfire, using passive restoration methods can lead to high levels of woody fuels, which in turn can lead to fires of unnaturally high intensity that can cause more severe damage to vegetation communities compared with natural fire regimes (Forest Service 2022). This would degrade the quality of wildlife habitat and alter vegetation composition that could impact birds, mammals, reptiles, and insects that rely on specific vegetative conditions for forage, nesting, or breeding. Additionally, the reliance on natural processes may lead to restoration projects requiring more time to achieve the same results active management can accomplish.

In the front country, passage, and outback areas, all vegetation management methods and tools would be available, including active restoration. Effects from vegetation management in these areas would be the same as described under Alternative A.

Under Alternative C, there would be 2,042,100 acres available to grazing in the livestock planning area, 75,200 acres less than under Alternative A (Table 2-1) and 8,610 fewer AUMs than under Alternative A. However, because this reduction in acres and AUMs is relatively small, there would likely not be a substantial benefit to wildlife habitat compared with Alternative A. Additionally, overlap of mule deer, bighorn sheep, and special status species habitats with allotments available for grazing would be similar to Alternative A; therefore, impacts would be expected to be similar.

Under Alternative C, approximately 527,000 acres of bighorn sheep habitat (4,400 fewer acres than under Alternative A) and 1,124,600 acres of mule deer habitat (75,200 fewer acres than under Alternative A) would overlap acres available for livestock grazing. Because the acres of habitat managed as available for grazing would be similar to Alternative A, it is expected that grazing under Alternatives A and C would impact wildlife habitat similarly. Overlap of special status species habitat and acres available for livestock grazing would also be similar compared with Alternative A; therefore, impacts would be expected to be similar. However, availability of naturally occurring water sources would be similar to Alternative B, and therefore, impacts would be expected to be similarly beneficial to wildlife habitat.

Under Alternative C, 486,300 acres would be designated as ERMA (more than 1.3 million fewer acres than under Alternative A) and 304,000 acres (206,400 more acres than under Alternative A) as SRMA (Table 2-1). This decrease would also correlate to a decrease in the overlap of RMAs with wildlife habitat including big game, migratory birds, and special status species and lead to more impacts on habitat. With less restrictions on recreation, there is the potential that larger group sizes, fewer restrictions on camping and campfires, and the development of facilities could lead to an increase degradation of wildlife habitat compared with Alternative A. Because each RMA would have different management prescriptions and wildlife habitats do not align with RMA boundaries, beneficial and adverse impacts on wildlife habitat from the designation of RMAs is difficult to categorize as recreational use would occur within RMAs; however, the rules and guidelines associated with RMAs are designed to reduce impacts recreational use would have on all GSENM objects, including wildlife and associated habitat.

Similar restrictions would be applied to the area management associated with Alternative C. Generally, management for the front country, passage, and outback areas would be less limiting while the primitive area would be more restrictive. The restrictions in the primitive area would reduce the impacts recreational activities would have on wildlife habitat. These restrictions could also limit the ability for management of habitat for specific species.

#### **Alternative D**

Alternative D would maximize natural processes by limiting discretionary actions. Land use allocations would curtail discretionary actions, including recreation, livestock grazing, ROWs, and activities under SRPs. This alternative would also constrain management actions to emphasize natural conditions such as passive vegetation management. Alternative D would restrict more discretionary actions and protect more wildlife habitat through land use allocations and, therefore, reduce impacts on wildlife and habitat compared with Alternative A.

Like Alternatives B and C, management direction under Alternative D focus on maintaining and restoring habitat connectivity, movement between ecological areas, seasonal use areas, and other important areas for sustainable populations, and would avoid adverse impacts on aquatic, avian, and terrestrial species habitat, including special status wildlife species and habitat, connectivity, and movement. Additionally, where adverse impacts cannot be avoided, project design features would reduce loss of native habitat, connectivity, and movement corridors. For aquatic habitat, the management direction on chemical use would be the same as described under Alternative B.

In areas where critical habitat is designated and contains the physical and biological features necessary for listed species, ROWs would be classified as exclusion. The only exception would be in areas that are identified as open for ROW location, see **Section 3.19**, Lands and Realty.

Under this alternative, the management direction would aim to facilitate water availability for native wildlife species, including special status wildlife, in order to offset the effects from persistent drought, and/or disperse wildlife to mitigate disease outbreak through the maintenance, restoration, and enhancement of natural water ways and wetlands. Additionally, new temporary water developments such as guzzlers and drinkers would be permitted, for a maximum of 6 months at a time, to supplement water for native wildlife species.

Alternative D would designate one RNA (ACEC), No Mans Mesa, the same as Alternative A. However, all lands with wilderness characteristics (559,600 acres) would be managed to protect wilderness characteristics, which is a more restrictive designation than under Alternative A, where lands with wilderness characteristics would not be protected. This management direction under Alternative D would provide more protection to both wildlife and their habitats by restricting some uses, such as recreation, that would be allowed in lands with wilderness characteristics. However, these designations would also restrict some management actions such as vegetation management that could benefit wildlife habitat.

#### *Impacts on Wildlife*

The vegetation management direction under Alternative D would prioritize natural processes and techniques compared with active restoration under Alternative A. The prioritization of natural processes would likely reduce the number of restoration projects that use active management and instead rely on passive management. Limiting active management, which would likely include groups of workers and equipment, would reduce direct impacts those projects would have on wildlife, including special status wildlife species. However, as described below under *Impacts on Wildlife Habitat*, the reduction in these projects may also adversely impact wildlife habitat. With the focus to maintain, enhance, and/or restore native habitat through vegetation management or other actions, that prioritize natural processes, management direction under Alternative D, would support sustainable populations of wildlife, including special status wildlife species. Specifically, the management direction for the California condor would be to protect condors by prohibiting surface use or disruptive activities within 0.5 miles of occupied roosts or 1 mile of occupied nests. For the western yellow-billed cuckoo and southwestern flycatcher, the management direction would be to prohibit habitat altering activities within occupied habitat during the primary breeding/ nesting season (April 1<sup>st</sup> through July 1<sup>st</sup>).

Under Alternative D, in addition to the allotments that are unavailable under Alternative B, and C, allotments within departed watersheds would be unavailable for grazing. This would result in 918,300 acres available for grazing under Alternative D in the livestock planning area, about 1.2 million fewer acres

than under Alternative A. It would reduce AUMs by 65,520, compared with Alternative A. Compared with Alternative A, this reduction in AUMs and acres available for livestock grazing would reduce competition between livestock and wildlife as well as limit impacts on species associated with habitats used by livestock. Specifically, big game species that directly compete with livestock for forage would benefit from the reduction in livestock grazing under this alternative.

Under Alternative D, approximately 315,300 acres of mule deer habitat would be available for grazing (884,500 fewer acres than under Alternative A; BLM GIS 2022). Compared with Alternative A, this would reduce direct competition for mule deer and other ungulates such as pronghorn. The reduction of grazing availability within winter mule deer habitat from 1,039,400 acres under Alternative A to 236,400 (BLM GIS 2022) under Alternative D would greatly reduce competition between livestock and mule deer during the winter when resources are less abundant. Other species such as small mammals, pollinators, and many migratory birds that rely on grasslands for forage and shelter would also benefit from the reduction in allotment availability and AUMs. Additionally, reduction of livestock grazing would beneficially affect the availability of naturally occurring water sources (e.g., springs) for use by wildlife.

Under Alternative D, less habitat for special status species would overlap with areas available for livestock grazing. The reduction in the overlap of Mexican spotted owl habitat and acres available for grazing from 436,300 acres under Alternative A to 57,500 under Alternative D would reduce impacts associated with Mexican spotted owl prey abundance and distribution (as previously described under Alternative A). Overlap of greater sage-grouse priority habitat management areas and southwestern willow flycatcher critical habitat would also decrease, but to a lesser degree (BLM GIS 2022).

Under Alternative D, grazing of domestic sheep and goats would be prohibited within GSENM. Additionally, domestic sheep and goats would only be allowed as pack animals outside of occupied desert bighorn sheep habitat. This prohibition and restriction would effectively eliminate the potential for disease transmission between domestic sheep and goats and bighorn sheep.

Under Alternative D, 311,900 acres would be designated as ERMAs and 100,300 as SRMAs. This decrease in RMAs compared with Alternative A could lead to more impacts on wildlife. With fewer restrictions on recreation, there is potential that larger group sizes, fewer restrictions on camping and campfires, and the development of facilities could lead to an increase in disturbance and avoidance of certain areas compared with Alternative A. Additionally, in Mexican spotted owl habitat, the management direction would prohibit new built infrastructure or facilities. Additional management directions such as group sizes for overnight camping, canyoneering, and rappelling within protected activity centers for Mexican spotted owl would be as described under alternative B.

Alternative D would close the only OHV open area that would be open under Alternative A, a portion of the Little Desert RMZ. This closure would likely have little impact on wildlife because the area is only 2,500 acres, and only 100 acres are open to cross-country OHV travel.

Under Alternative D, OHV use would be limited to designated routes on 427,600 acres (about 23 percent of GSENM), and 1,438,000 acres (77 percent of GSENM) would be closed to OHV use. However, the number of miles of existing routes that would be open to OHV use under Alternative D, would be the same as under Alternative A (912 miles, which is 9 fewer miles; BLM GIS 2022). As a result, most effects on wildlife from OHV use would be the same as under Alternative A

Alternative D would close 1,043,900 acres that overlap mule deer habitat and 525,600 acres that overlap bighorn sheep habitat (BLM GIS 2022). Approximately 408,100 acres of OHV closed would overlap Mexican spotted owl critical habitat and 5,300 acres would overlap protected activity centers. Smaller overlaps of OHV closed areas would occur for greater sage-grouse habitat management areas and southwestern willow flycatcher critical habitat (1,800 and 1,100 acres, respectively; BLM GIS 2022). However, because the overall number of miles of existing routes that would be open to OHV use under Alternative D, would be nearly the same as under Alternative A, most effects on wildlife from OHV use would be the same as under Alternative A.

Recreational shooting would be prohibited throughout GSENM. This reduction of acres available for recreational shooting would reduce noise and human presence and, therefore, reduce disturbance to and avoidance by wildlife. Additionally, the prohibition of recreational shooting would eliminate the unintentional exposure of wildlife to lead ammunition.

#### *Impacts on Wildlife Habitat*

The prioritization of natural processes may limit the amount of restoration projects, methods, and techniques that would be available under Alternative D. Effects would be the same as those described for the primitive area, under Alternative C.

Compared with Alternative A, Alternative D would prioritize the use of native vegetation for all vegetation management efforts. However, under emergency situations, the use of nonnative vegetation would be approved as long as the seeding leads toward a native vegetation community. This distinction is important because it allows management to conduct vegetation management that may be of high priority and immediately necessary, even if native seed is unavailable.

Under Alternative D, in addition to the allotments that are unavailable under Alternative C, allotments within watersheds that have a high departure from ecological site conditions where there is no substantial evidence that conditions are improving would be unavailable. This would result in 918,300 acres available for grazing under Alternative D in the livestock planning area, about 1.2 million fewer acres than under Alternative A. It would reduce AUMs by 65,520, compared with Alternative A. Compared with Alternative A, this reduction in AUMs and acres available for livestock would reduce the potential for surface disturbance through livestock grazing practices and range improvements.

Approximately 197,800 acres of bighorn sheep habitat and 315,300 acres of mule deer habitat would overlap acres available for livestock grazing under Alternative D. Additionally, only 57,500 acres of Mexican spotted owl habitat would overlap acres available for livestock grazing (BLM GIS 2022). This decrease in acres available for grazing would protect habitats used by these species from degradation associated with livestock grazing. Because greater sage-grouse require specific sagebrush habitat characteristics throughout their life cycles, protecting these characteristics in grazing permits is crucial to maintaining habitat suitability. Additionally, because southwestern willow flycatcher habitat is closely associated with riparian systems and livestock require access to water, the southwestern willow flycatcher critical habitats that overlap grazing acreage could become unsuitable if grazing alters the riparian ecosystems.

Under Alternative D, 311,900 acres would be designated as ERMAs and 100,300 acres as SRMAs. This decrease would also correlate with a decrease in the overlap of RMAs with wildlife habitats, including habitats for big game, migratory birds, and special status species, and lead to more impacts on habitat.

With fewer restrictions on recreation, there is potential that larger group sizes, fewer restrictions on camping and campfires, and the development of facilities could lead to increased degradation of wildlife habitat compared with Alternative A. Because each RMA would have different management prescriptions and wildlife habitats do not align with RMA boundaries, beneficial and adverse impacts on wildlife habitat from the designation of RMAs is difficult to categorize. In some instances, RMA prescriptions may be used to concentrate recreational users into specific areas, thereby concentrating impacts and reducing impacts in other areas. However, wildlife habitats in areas where recreational use is concentrated may be disproportionately affected, and habitat suitability for some species could decline or habitats become unsuitable. Recreational use impacts on wildlife habitat within RMAs from would occur; however, the rules and guidelines associated with RMAs are designed to reduce the impacts recreational use would have on all GSENM objects, including wildlife and associated habitat.

### **Alternative E**

Management directions, goals, and objectives under Alternative E would largely be similar to those described under Alternative C, which emphasizes the protection and resiliency of natural landscapes. The effects on fish and wildlife species and habitat would generally be the same as described under Alternative C. Alternative E primarily focuses on protecting the biological integrity of terrestrial and aquatic ecosystems for the benefit of aquatic, avian, and terrestrial wildlife habitats, and populations, including seasonal, migratory, and connectivity habitats. Like Alternative C, four management areas would be established: front country, passage, outback, and primitive. These areas would be used to identify allowable uses that meet the area's goals and objectives while also protecting GSENM objects. Additionally, like Alternatives B, C, and D, management direction under Alternative E would focus on maintaining and restoring habitat connectivity, movement between ecological areas, seasonal use areas, and other important areas for sustainable populations, and would avoid adverse impacts on aquatic, avian, and terrestrial species, including special status species habitat, connectivity, and movement. Additionally, where adverse impacts cannot be avoided, project design features would reduce loss of native habitat, connectivity, and movement corridors. Like Alternative C, the construction of aquatic organism barriers would be allowed if the benefit of nonnative species control and special status species protection is greater than the loss in connectivity. For aquatic habitat, the management direction on chemical use would be the same as described under Alternative B.

The management direction under this alternative for ROWs would be the same as described under Alternative B and C.

Water developments under this alternative would be the same as described under Alternative C.

### *Impacts on Wildlife*

Because the vegetation management direction under Alternative E would be the same as under Alternative C, including such as active restoration in the front country, passage, and outback areas, and passive restoration in the primitive areas, impacts from restoration activities on wildlife, including special status wildlife species, would be the same as described under Alternative C. Additionally, the management direction for the California condor would be the same as described under Alternative C. For the western yellow-billed cuckoo and southwestern flycatcher, the management direction would be to prohibit habitat altering activities within occupied habitat during the primary breeding/ nesting season (April 1<sup>st</sup> through July 1<sup>st</sup>) unless other mitigation actions would provide similar protection to the species, following consultation with the USFWS.

Additionally, impacts from livestock grazing would be similar to those described under Alternative B and C. Four additional pastures would become unavailable for livestock grazing to protect riparian areas, but remain available for livestock trailing as necessary. This would add 130,000 acres of big game habitat managed as unavailable for livestock grazing by the BLM, in consultation with the state DWR by reducing competition for forage between big game species and livestock.

Allotments available under Alternative E that overlap special status species habitat would not vary dramatically from Alternative A. Therefore, impacts on these species would be similar for Alternative E. However, four pastures that would be unavailable under Alternative E are along the Paria River, which may result in less intensity of effects for riparian-associated special status birds. These pastures are: the Long Canyon Stock Driveway, Circle Cliffs allotment, Gulch Pasture, Cottonwood allotment (Paria River and Paria Box pastures), and Upper Paria allotment, Upper River pasture.

Like Alternatives C and D, grazing of domestic sheep and goats would not be permitted within GSENM and domestic sheep and goats would only be used as pack animals outside of occupied desert bighorn sheep habitat under Alternative E. This prohibition and restriction would effectively eliminate the potential for disease transmission between domestic sheep and goats and bighorn sheep. However, the BLM may authorize the use of domestic sheep and/or goats, to meet vegetation management objectives or for scientific research purposes, if consistent with the protection of GSENM objects and effective physical separation between domestic sheep/goats and wild sheep is maintained. Impacts on wildlife would be the same as described under Alternative D.

Under Alternative E, 486,300 acres would be designated as ERMA's and 417,400 acres as SRMA's, which is the same as under Alternative C. Impacts on wildlife would be the same as described under Alternative C.

Restrictions similar to those under Alternative C would be applied for the area management associated with Alternative E. In general, management for the front country and passage areas would be less limiting while management for the outback and primitive areas would be more restrictive, as described under Alternative C. In summary, impacts on wildlife-associated recreational uses such as hiking and camping would be reduced in the outback and primitive areas and increased in the front country and passage areas.

Acres of closed and limited OHV allocations, as well as miles of designated routes open to OHVs, under Alternative E would be the same as under Alternative C; therefore, impacts on wildlife, including special status species, would be the same as described under Alternative C.

Development and maintenance of recreation and administrative facilities within Mexican spotted owl habitat would be as described as under Alternative C. Additionally, the management direction under this alternative would be similar to Alternatives B, C, and D, within Mexican spotted owl protected activity centers during the breeding/nesting season (March 1 to August 31) but with a few exceptions ; 1) Canyon walls cannot be used for either access or exit, 2) Canyoneering, rappelling, and rock climbing must occur entirely within canyon bottoms, 3) Groups size limited to 12 and overnight camping is prohibited.

### ***Impacts on Wildlife Habitat***

The effects on wildlife habitat from vegetation management under Alternative E would be similar to those described for Alternative C. All vegetation management methods and tools would be available, including active restoration, in the front country, passage, and outback areas, whereas only passive restoration



methods would be available in the primitive area. In addition, there would be the possibility for large landscape-scale restoration projects that would protect and restore a mosaic of noninvasive perennial and annual vegetation communities across the landscape, with diversity of species, canopy, density, and different stages of composition. See **Section 3.3.2, Vegetation, Including Special Status Plants.**

Under Alternative E, grazing allotments that are unavailable is similar to Alternative B and C. Therefore, impacts on mule deer, bighorn sheep, and special status species habitats would be the same as described under Alternative C.

Alternative E is similar to Alternative C in that approximately 524,000 acres of bighorn sheep habitat (more precisely, 527,000 acres under Alternative C) and 1,124,600 acres of mule deer habitat (under both Alternatives C and E) overlap acres available for livestock grazing. Because these overlaps of habitat and acres available for grazing are similar to Alternative A, it is expected that grazing under Alternatives A, C, and E would impact wildlife habitat similarly. Additionally, impacts on special status species habitat would be as described under Alternative C.

Under Alternative E, 486,300 acres would be designated as ERMA's and 417,400 acres as SRMA's, which is the same as under Alternative C. This decrease would also correlate to a decrease in the overlap of RMA's with wildlife habitat, including that of big game, migratory birds, and special status species, and lead to more impacts on habitat. Impacts on wildlife habitat would be the same as described under Alternative C.

Under Alternative E, restrictions similar to those associated with Alternative C would be applied to area management, and impacts on wildlife habitat would be as described under Alternative C.

### **Cumulative Impacts**

The cumulative impacts analysis area for fish, wildlife, and special status species varies by species. Analysis areas for big game species are composed of game management units that intersect GSENM. For aquatic species, the cumulative impacts analysis area extends outside GSENM, following boundaries of the watersheds that completely or partially overlap it. For migratory birds and terrestrial wildlife species other than big game, the cumulative impacts analysis area is GSENM. Cumulative impacts on fish, wildlife, and special status species are linked to those described for vegetation, as vegetation communities provide habitat for wildlife.

Past, present, and reasonably foreseeable future actions would have varying beneficial and adverse impacts on fish, wildlife, and special status species. Past discretionary actions have caused (1) habitat degradation, loss, and fragmentation; (2) increased human presence (including increases in vehicle and aviation use and resulting noise); and (3) the spread of invasive species. However, management efforts, including vegetation management and habitat restoration activities, have had beneficial impacts by improving habitat connectivity, plant productivity, vegetation diversity, and ecosystem health.

Ongoing management for fish, wildlife, and special status species by the BLM, UDWR, and NPS include the dedication of resources for maintaining and restoring habitats and the consideration of these resources during review and approval of discretionary actions. These actions are critical to maintaining healthy and sustainable populations given the increasing levels of visitation and recreational use that are anticipated.

Reasonably foreseeable future projects that would affect fish, wildlife, and special status species in the cumulative impacts analysis areas include:

- Sage-grouse habitat restoration that would include vegetation management to thin and reduce pinyon pine and Utah juniper to allow the establishment of grasses and forbs. Restoration would also include actions to reduce erosion and sedimentation.
- Development of a noxious and invasive species vegetation management plan for the KFO. Because the KFO shares boundaries with GSENM, this plan would impact GSENM by reducing the spread of noxious weeds from outside its borders.

Additionally, other projects, such as ROW projects (for example, the Lake Powell Pipeline), road development and maintenance, and renewable energy projects, would also have the potential to impact fish, wildlife, and special status species.

As described in **Section 3.1.2**, Climate Change (Including Greenhouse Gases), changes in climate would continue throughout the region including GSENM. Changes in vegetation composition due to increased temperatures, departure from normal fire regimes, and changes in precipitation patterns will likely impact habitat suitability for many species. These changes have already been documented in portions of GSENM. As described in **Section 3.3**, Vegetation, *Affected Environment*, vegetation communities that have the highest potential for impacts due to climate change include shrubland, riparian, and pinyon-juniper woodland vegetation communities (Bryce et al. 2012). Wildlife that **uses** these habitats will be impacted by a reduction in or loss of habitat suitability.

In general, the reduced restrictions on discretionary actions under Alternatives A and B, when combined with other land uses and past, present, and reasonably foreseeable future actions, would result in adverse cumulative impacts on fish, wildlife, and special status species. Management actions and allocations associated with Alternatives C, D and E would contribute to adverse cumulative effects on fish, wildlife, and special status species to a lesser degree than Alternatives A and B because of their additional restrictions on discretionary actions and other resource uses.

## **3.10 VISUAL RESOURCES**

### **3.10.1 Affected Environment**

The visual resources of GSENM are highly scenic, highly valued by the public, exceedingly undeveloped, and intact. Many areas in GSENM possess a high degree of scenic quality and a high level of sensitivity to change. GSENM contains internationally recognized scenic destinations and draws an increasing number of visitors who come to the area to recreate and sightsee. The detail provided here and in **Appendix I.10** includes a discussion of the GSENM Visual Resource Inventory (VRI), the trends and forecasts of current and future conditions of visual resources in GSENM, and the current VRM Classes.

Specifically, **Table 3-50** to **Table 3-55** depict the different components of the BLM VRI, as well as the current BLM VRM classes for GSENM. Further, a series of maps (in **Appendix A**) display these data in GSENM's boundaries, as follows:

- **Figure 3-30:** Visual Resource Inventory Classes with Visual Resource Inventory Class I
- **Figure 3-31:** Visual Resource Inventory Classes without Visual Resource Inventory Class I
- **Figure 3-32:** Scenic Quality Rating

- **Figure 3-33:** Sensitivity Level Rating
- **Figure 3-34:** Distance Zones
- **Figure 2-3:** Alternative A: Visual Resource Management

**Table 3-50. BLM Visual Resource Inventory Classes with Visual Resource Inventory Class I**

| <b>VRI Class</b> | <b>Acres<br/>(% of GSENM)</b> |
|------------------|-------------------------------|
| Class I          | 881,100 (47%)                 |
| Class II         | 550,300 (30%)                 |
| Class III        | 235,400 (13%)                 |
| Class IV         | 198,500 (10%)                 |

Source: BLM 2019

**Table 3-51. BLM Visual Resource Inventory Classes without Visual Resource Inventory Class I**

| <b>VRI Class</b> | <b>Acres<br/>(% of GSENM)</b> |
|------------------|-------------------------------|
| Class II         | 1,154,800 (62%)               |
| Class III        | 378,700 (20%)                 |
| Class IV         | 331,900 (18%)                 |

Source: BLM 2019

**Table 3-52. BLM Visual Resource Inventory Scenic Quality**

| <b>Scenic Quality</b>        | <b>Acres<br/>(% of GSENM)</b> |
|------------------------------|-------------------------------|
| Scenic Quality A Inventoried | 870,100 (47%)                 |
| Scenic Quality B Inventoried | 985,700 (52%)                 |
| Scenic Quality C Inventoried | 9,600 (1%)                    |

Source: BLM 2019

**Table 3-53. BLM Visual Resource Inventory Sensitivity Levels**

| <b>Sensitivity Level</b>                                | <b>Acres<br/>(% of GSENM)</b> |
|---|-------------------------------|
| Maintenance of the visual quality<br>has high value     | 1,119,000 (60%)               |
| Maintenance of the visual quality<br>has moderate value | 704,900 (38%)                 |
| Maintenance of the visual quality<br>has low value      | 41,600 (2%)                   |

Source: BLM 2019

**Table 3-54. BLM Visual Resource Inventory Distance Zones**

| <b>Distance Zone</b>    | <b>Acres<br/>(% of GSENM)</b> |
|-------------------------|-------------------------------|
| Foreground-middleground | 896,600 (48%)                 |
| Background              | 62,400 (3%)                   |
| Seldom seen             | 906,400 (49%)                 |

Source: BLM 2019

**Table 3-55. Current Visual Resource Management Classes**

| VRM Class | Acres<br>(% of GSENM) |
|-----------|-----------------------|
| Class I   | 881,100 (47%)         |
| Class II  | 422,300 (23%)         |
| Class III | 346,500 (19%)         |
| Class IV  | 215,300 (11%)         |

Source: BLM 2020

**3.10.2 Environmental Consequences**

Refer to **Section F.15**, Visual Resources, in **Appendix F**, Analytical Framework, for descriptions of the indicators, analysis areas, and assumptions used for the following analysis.

**Issue**

- How would proposed management affect inventoried visual values, including scenic quality, and the public's highly valued experience of enjoying scenery?

The geographic scope for visual resources corresponds to the visible area surrounding GSENM up to 15 miles beyond the boundary, which is associated with the limit of the background distance zone of the GSENM visual inventory. The **temporal** scope of the analysis is the life of the RMP. The BLM quantified the impacts on visual resources by identifying the potential effect on scenic quality resulting from different VRM class allocations. Changes to the characteristic landscape could decrease the scenic quality inventory key factor scores (specifically vegetation, adjacent scenery, and cultural modifications) and lead to diminishing scenic quality where the designated VRM class objectives would allow management activities to attract attention or dominate landscape character. **Figures 2-2 to 2-6** in **Appendix A** depict the VRM class allocations for each alternative.

**Table 3-56** identifies the acres of VRM class allocations, by alternative, within scenic quality ratings inventoried in GSENM. To further highlight high scenic quality landscapes that could be modified by management activities—which would result in these activities attracting attention and potentially dominating the characteristic landscape—areas inventoried during the 2018 VRI with a scenic quality rating of A (high scenic value) with VRM Class III or IV allocations are identified in **Table 3-56** and discussed for each alternative in the following sections. Effects on other components of the GSENM VRI, including sensitivity levels and distance zones, are described by alternative, as applicable. Additional narrative discussions describe other potential impacts on visual resources, including specific viewsheds that would be further protected through VRM class allocations.

**Table 3-56. Summary of Scenic Quality Classes and Proposed Visual Resource Management Class by Alternative**

| Scenic Quality       | Scenic Quality<br>A Inventoried | Scenic Quality<br>B Inventoried | Scenic Quality<br>C Inventoried |
|----------------------|---------------------------------|---------------------------------|---------------------------------|
| <b>Alternative A</b> |                                 |                                 |                                 |
| VRM Class I          | 546,400                         | 333,600                         | 1,100                           |
| VRM Class II         | 270,900                         | 151,400                         | 0                               |
| VRM Class III        | 51,700                          | 293,100                         | 1,700                           |
| VRM Class IV         | 1,100                           | 207,400                         | 6,800                           |

| Scenic Quality       | Scenic Quality<br>A Inventoried | Scenic Quality<br>B Inventoried | Scenic Quality<br>C Inventoried |
|----------------------|---------------------------------|---------------------------------|---------------------------------|
| <b>Alternative B</b> |                                 |                                 |                                 |
| VRM Class I          | 590,000                         | 363,900                         | 1,100                           |
| VRM Class II         | 279,900                         | 306,900                         | 4,400                           |
| VRM Class III        | 200                             | 314,800                         | 4,100                           |
| VRM Class IV         | 0                               | 0                               | 0                               |
| <b>Alternative C</b> |                                 |                                 |                                 |
| VRM Class I          | 657,300                         | 463,800                         | 1,100                           |
| VRM Class II         | 212,700                         | 403,400                         | 7,700                           |
| VRM Class III        | 100                             | 118,500                         | 800                             |
| VRM Class IV         | 0                               | 0                               | 0                               |
| <b>Alternative D</b> |                                 |                                 |                                 |
| VRM Class I          | 716,500                         | 718,700                         | 5,400                           |
| VRM Class II         | 153,600                         | 267,000                         | 4,200                           |
| VRM Class III        | 0                               | 0                               | 0                               |
| VRM Class IV         | 0                               | 0                               | 0                               |
| <b>Alternative E</b> |                                 |                                 |                                 |
| VRM Class I          | 670,400                         | 539,400                         | 1,100                           |
| VRM Class II         | 199,400                         | 340,300                         | 7,700                           |
| VRM Class III        | 300                             | 106,000                         | 800                             |
| VRM Class IV         | 0                               | 0                               | 0                               |

Source: BLM 2019; BLM GIS 2022

### Impacts Common to All Alternatives

The protection, preservation, and enhancement of visual-specific GSENM objects would vary among the alternatives with differing levels of protection of landscapes through VRM class allocations and specific protective measures. Under all alternatives, the BLM allocates VRM Class I objectives to lands within WSAs, suitable VSR segments classified as wild, and lands with wilderness characteristics managed to protect those characteristics, where decisions have been made to preserve a natural landscape. Increases in viewer sensitivity are anticipated under all alternatives as undeveloped, naturally intact lands become scarcer throughout the United States. The public will likely become increasingly sensitive to changes in landscape character in GSENM. The management prescriptions associated with the alternatives would not lead to measurable changes in sensitivity levels beyond continuation of existing trends and forecasts. No changes to BLM distance zones are anticipated; this is because no new primary travel corridors or other changes to major viewing platforms, from which BLM distance zones are established, would occur under any alternative.

Management for vegetation, lands and realty, livestock grazing, range improvements, recreation, and transportation could result in direct and indirect impacts on visual resources. These types of management activities on BLM-managed lands could result in modest increases in visual contrast, especially in the foreground/middle ground distance zones throughout the planning area. These activities are not forecasted to be implemented in locations or at scales or densities that would cause scenic quality ratings to shift especially where managed as VRM Class I or VRM Class II. Changes in scenic quality scoring factors, including landform modification, vegetation modification, or cultural modifications associated with these management activities, could reduce the scenic quality rating where managed as VRM Class III or IV, allowing for a greater level of visual contrast.

Changes to the scenic quality outside the BLM's influence or control, including climate change and development of adjacent non-BLM-managed lands, would continue to impact landscape character within GSENM, as described in above in *Affected Environment*.

### **Alternative A**

As described under *Impacts Common to All Alternatives*, Alternative A assigns VRM Class I objectives to all lands within WSAs and [wild segments of WSRs](#), where previous administrative decisions have been made to preserve the natural landscape. To minimize impacts, to only allow management activities that retain the existing characteristic landscape, and to only allow management activities that would not attract a viewer's attention, 422,300 acres (23 percent) of GSENM are allocated as VRM Class II objectives. Similarly, 346,500 acres (19 percent) are allocated as VRM Class III objectives where management activities would partially retain the existing characteristic landscape and would not dominate views. As identified in [Table 3-56](#), portions of scenic quality A inventoried landscapes are allocated as VRM Class III objectives under this alternative, where management activities would continue to be allowed to attract attention. This could [result in a potential decrease in scenic quality in these areas, which would](#) modify the landscapes' scenic quality inventory key factor scores. Specifically, this includes portions of the following scenic quality ratings units:

- Butler Valley/Big Dry Valley
- Circle Cliffs
- Henderson/Pardner/Mud Spring Canyons
- Straight Cliffs/Fiftymile Bench
- The Cockscomb
- Upper Gulch/Wolverine Bench
- Upper Kaiparowits Plateau
- Vermilion Cliffs/Paria-Hackberry
- Wahweap/Rimrocks
- White Cliffs
- Willis Creek

The BLM allocated 215,700 acres (12 percent) VRM Class IV objectives, where management activities could dominate the characteristic landscape and be the major focus for viewers. As identified in [Table 3-56](#), portions of scenic quality A inventoried landscapes are allocated as VRM Class IV objectives under this alternative, specifically the Upper Kaiparowits Plateau scenic quality rating unit.

To enhance the scenic quality and the characteristic landscape, to the extent practicable and as the opportunity arises, existing visual contrasts remaining from past land uses would continue to be brought into conformance with allocated VRM class objectives.

Under Alternative A, temporary projects, such as research projects and meteorological monitoring stations, would continue to be allowed to exceed VRM class objectives, if the project terminates within 3 years of initiation with rehabilitation ongoing throughout project implementation or beginning at the end of the 3-year period. By allowing short-term contrast levels to exceed VRM class objectives, visual values

would be impacted in GSENM, including a short-term reduction of scenic quality until rehabilitation has been successfully completed.

### **Alternative B**

Under Alternative B, additional VRM Class I areas would protect more expansive lands with wilderness characteristics than under Alternative A. Alternative B also protects more scenic quality A inventoried areas with VRM Class I and II allocations than Alternative A (see **Table 3-56**). To minimize impacts on scenic quality A inventoried areas (except for the congressionally designed utility corridor along U.S. Highway 89) and to retain the natural landscape character, the BLM would allocate VRM Class II objectives to lands in VRI Class II areas within the BLM foreground and **middle ground** distances of designated scenic routes, the area adjacent to the OSNHT **Management Corridor** Box of Paria high-potential segment. All other lands would be allocated as VRM Class III objectives, including the designated utility corridor along U.S. Highway 89, to partially retain the existing landscape character. Because no lands would be managed under VRM Class IV objectives, no management activities would be allowed to dominate the view or be the major focus of viewer attention.

As identified in **Table 3-56**, a portion of a scenic quality A inventoried landscape would be allocated as VRM Class III objectives under this alternative, where management activities would be allowed to attract attention. This could modify the landscape's scenic quality inventory key factor scores, resulting in a potential decrease in scenic quality in these areas. Specifically, this includes a portion of **I** Cockscomb, which would be allocated as VRM Class III objectives based the presence of a congressionally designated utility corridor along U.S. Highway 89. The portion of the Cockscomb that would be allocated as VRM Class III objectives could be further modified through utility development; these future development projects would be required to partially retain the area's existing landscape character as analyzed through the BLM contrast rating process to determine conformance with VRM Class III objectives.

To enhance the scenic quality and characteristic landscape, existing visual contrasts from past land uses would be reduced, to the extent possible, through appropriate mitigation measures. Compared with Alternative A, Alternative B would seek to reduce visual contrast for past land uses more universally, though past projects would not need to meet VRM class allocations under this alternative.

Under Alternative B, temporary projects, such as research projects, would be allowed to exceed VRM standards in Class II and III areas if the project terminates within 2 years of initiation with rehabilitation needing to occur at the end of this 2-year period. By allowing short-term contrast levels to exceed VRM class objectives, visual values would be impacted in GSENM, including a short-term reduction of scenic quality until rehabilitation has been successfully completed. These effects would be shorter in duration than under Alternative A. This **is** because Alternative A identified a 3-year period for temporary projects, whereas Alternative B has a 2-year period.

### **Alternative C**

Under Alternative C, additional VRM Class I areas would protect more expansive lands with wilderness characteristics within the primitive area, compared with Alternative A. Other portions of lands with wilderness characteristics, in the passage and outback areas, would be managed under VRM Class II objectives to retain their existing landscape character. Additionally, to minimize impacts on scenic quality A inventoried areas and to retain the natural landscape character, the BLM would allocate VRM Class II objectives to the lands within the BLM foreground and **middle ground** distances of designated scenic routes

and the and the OSNHT corridor, except for portions of the corridor that fall within the congressionally designated utility corridor along HWY 89, which would be managed as Class III. All other lands in GSENM would be managed under VRM Class III objectives, where management actions would be required to partially retain the existing landscape character and may attract attention, but should not dominate the view.

Because no lands would be managed under VRM Class IV objectives, no management activities would be allowed to dominate the view or be the major focus of viewer attention. As identified in **Table 3-56**, there are no scenic quality A inventoried areas that would be allocated as VRM Class III or IV objectives under this alternative. It is not anticipated that management activities in these scenic quality A inventoried areas, allocated as either VRM Class I or II objectives, would result in modification of the scenic quality inventory key factor scores associated with these high-quality landscapes.

To enhance the scenic quality and characteristic landscape, existing visual contrasts from past land uses would be reduced, to the extent practicable, through appropriate mitigation measures within the front country and passage areas. Further, within the outback and primitive areas, existing visual contrasts from past land uses would be brought into conformance with allocated VRM class objectives. Compared with Alternative A, Alternative C would seek to reduce the visual contrast for past land uses more universally and within the outback and primitive areas. Alternative C would also require past projects to meet VRM objectives, in the outback and primitive areas, which are more stringent than current management.

Under Alternative C, the effects of temporary projects, such as research projects, on visual resources would be the same as those described under Alternative B.

#### **Alternative D**

Under Alternative D, all of GSENM would be managed as VRM I or II, including additional VRM Class I areas to protect more expansive lands with wilderness characteristics, compared with Alternative A. Because no land would be managed under VRM Class III or IV objectives, no management activities would be allowed to attract attention, dominate the view, or be the major focus of viewer attention.

As identified in **Table 3-56**, there are no scenic quality A inventoried areas that would be allocated as VRM Class III or IV objectives under this alternative. It is not anticipated that management activities in these scenic quality A inventoried areas, allocated as either VRM Class I or II objectives, would result in modification of the scenic quality inventory key factor scores associated with these high-quality landscapes. Alternative D would also allocate the most acreage of scenic quality A inventoried areas as VRM Class I compared with all other alternatives. Because VRM Class I and II would be allocated across GSENM, the landscape character would be retained. Further, because only VRM Class I and II would be allocated under Alternative D, all landscapes within GSENM would be protected with the natural landscape character being retained. Any proposed future land uses would be required to not attract attention of the casual viewer.

To enhance the scenic quality and characteristic landscape, existing visual contrasts from past land uses would be brought into conformance with allocated VRM class objectives. Unlike Alternative A, Alternative D would require these past projects to meet the objectives associated with the VRM class allocations, which are more stringent than current management.



Under Alternative D, the effects of temporary projects, such as research projects, on visual resources would be the same as those described under Alternative B.

### **Alternative E**

Under Alternative E, additional VRM Class I areas would protect more expansive lands with wilderness characteristics within the primitive area, compared with Alternative A. Lands with wilderness characteristics in the passage and outback areas, as well as all lands within primitive and outback areas not managed under VRM Class I, would be managed under VRM Class II objectives to retain their existing landscape character. Additionally, to minimize impacts on scenic quality A inventoried areas and to retain the natural landscape character, the BLM would allocate VRM Class II objectives to the lands within the BLM foreground and middle ground distances of designated scenic routes, a 4-mile segment within the designated utility corridor along Highway 89 near the Cockscomb formation, the area within the OSNHT management corridor (except for the portion that falls within the designated utility corridor along Highway 89), and all other VSR scenic and recreation segments not managed under VRM Class I objectives. All other lands in GSENM would be managed under VRM Class III objectives, where management actions would be required to partially retain the existing landscape character and may attract attention but should not dominate the view.

Because no lands would be managed under VRM Class IV objectives, no management activities would be allowed to dominate the view or be the major focus of viewer attention. As identified in **Table 3-56**, there are no scenic quality A inventoried areas that would be allocated as VRM Class III or IV objectives under this alternative. Management activities in these scenic quality A inventoried areas, allocated as either VRM Class I or II objectives, would not result in modification of the scenic quality inventory key factor scores associated with these high-quality landscapes.

To enhance the scenic quality and characteristic landscape, existing visual contrasts from past land uses would be reduced, to the extent practicable, through appropriate mitigation measures within the front country and passage areas. Further, within the outback and primitive areas, existing visual contrasts from past land uses would be brought into conformance with allocated VRM class objectives. Compared with Alternative A, Alternative E would seek to reduce the visual contrast for past land uses more universally and within the backcountry and primitive areas. Alternative E would also require past projects in the outback and primitive areas to meet VRM objectives, which are more stringent than current management.

Under Alternative E, the effects of temporary projects, such as research projects, on visual resources would be similar to those described under Alternative B. An exception would be rehabilitation of impacts that exceed VRM objectives, which would be brought into conformance within 3 years after project termination. This would result in reduced potential effects on scenic quality associated with temporary projects over the long term compared to Alternative B.

### **Cumulative Impacts**

The cumulative impacts analysis area for visual resources is the visible area surrounding GSENM up to 15 miles beyond the boundary. This is the same as the direct and indirect effects analysis area, which corresponds to the background distance zone of the GSENM visual inventory. Views can extend beyond this distance, but the BLM chose this 15-mile distance because it represents the limit beyond which most anticipated development around GSENM would be visible to casual observers.

Past, present, and reasonably foreseeable future actions and conditions (**Appendix F**, Analytical Framework) in the cumulative impacts analysis area that have and would likely continue to adversely affect visual resources include development of non-BLM-managed inholdings and adjacent areas for residential, commercial, and other uses. Additionally, proposed utility ROW projects, mineral extraction, vegetation management, and renewable energy development, including the Lake Powell Pipeline, Garkane Transmission Lines, Alton Coal, Rangeland Wells and Pipelines, , and solar development near Big Water, could result in additive, long-term effects on visual resources. Alternatives B, C, D, and E would offer more protection of visual resources than Alternative A.

Management of visual resources on BLM-managed lands may also be incompatible with visual management objectives on adjacent lands. Alternative A includes VRM Class IV objectives within the viewsheds of Glen Canyon and Bryce Canyon National Park; these Class IV objectives could result in adverse impacts on these NPS landscapes because management activities could dominate the characteristic landscape and be the major focus for viewers. Additionally, Alternative A includes VRM Class III objectives within the viewsheds of Glen Canyon, Bryce Canyon National Park, and Capitol Reef National Park; this could result in adverse impacts on these NPS landscapes where management activities would be allowed to attract attention of the casual viewer.

Alternatives B,C, and E include smaller areas of VRM Class III objectives within the viewsheds of Glen Canyon, Bryce Canyon National Park, and Capitol Reef National Park compared with Alternative A. This would limit the potential effect on these adjacent NPS units. Because Alternative D would only allocate VRM Class I and VRM Class II objectives, it would protect viewsheds from the adjacent NPS units, including Glen Canyon, Bryce Canyon National Park, and Capitol Reef National Park.

**3.11 DARK NIGHT SKIES**

**3.11.1 Affected Environment**

Dark skies are an important and noteworthy attribute of the GSENM landscape. Research revealed that GSENM is one of the most naturally dark outdoor spaces of its size left in the lower 48 states. This section and Appendix I.11 discuss dark night skies in and around GSENM. The detail provided here and in Appendix I.11 includes a discussion of on-the-ground reading of sky luminance, taken from 18 locations in and adjacent to GSENM (Table 3-57), areas of GSENM where different thresholds of light pollution (Bortle Scale classes) currently exist (Table 3-58 and Figure 3-35 in Appendix A), and the trends and forecasts of current and future conditions of dark night skies in GSENM.

**Table 3-57. Baseline Night Sky Quality Reading Locations – Existing Sky Luminance**

| Site Name                   | Sky Luminance Average |
|-----------------------------|-----------------------|
| Big Spencer Flat            | 21.813                |
| Big Water Visitor Center*   | 20.628                |
| Boulder Town*               | 21.781                |
| Burr Trail Scenic Backway   | 21.862                |
| Butler Valley Viewpoint     | 21.548                |
| Cannonville Visitor Center* | 18.732                |
| Circle Cliffs Overlook      | 21.934                |
| Devil’s Garden              | 21.875                |
| Escalante Visitor Center*   | 21.695                |
| Kanab GSENM Headquarters*   | 18.542                |
| Kanab Visitor Center*       | 17.485                |

| Site Name                    | Sky Luminance Average |
|------------------------------|-----------------------|
| Kitchen Wash: Big Bird Panel | 22.186                |
| New Home Bench               | 21.774                |
| Paria Contact Station        | 21.767                |
| Pet Hollow                   | 21.812                |
| Skutumpah Road               | 21.754                |
| The Blues Overlook           | 21.816                |
| Tropic Main Street*          | 17.890                |

Source: [Dark Sky International](#) and Ogden Valley Starry Nights Chapter 2016

\*Located outside the boundary of GSENM

Note: Higher numbers correspond to more pristine night skies.

**Table 3-58. Existing Light Pollution (Ratio of Artificial Sky Brightness to Natural Sky Brightness)**

| Ratio of Artificial Sky Brightness to Natural Brightness (Bortle Class) | Acres     |
|---|-----------|
| 0.00–0.01 (Bortle Class 1)  | 1,863,500 |
| 0.01–0.02 (Bortle Class 2)  | 2,100     |

Source: Falchi et al. 2016

Note: Higher numbers correspond to locations with increased light pollution.

### 3.11.2 Environmental Consequences

Refer to **Section F.16**, Dark Night Skies, in **Appendix F**, Analytical Framework, for descriptions of the indicators, analysis areas, and assumptions used for the following analysis.

#### Issue

- How would proposed management under the alternatives affect dark night skies?

The geographic scope for dark night skies corresponds to the planning area and adjacent communities producing light pollution in GSENM. The temporal scope of the analysis is the life of the RMP. The BLM assessed the impacts on dark night skies by identifying the extent of GSENM where lighting restrictions would occur to protect dark night skies. By identifying the areas where lighting would be restricted, the extent of protection for dark night skies can be quantified for each alternative. There would be no areas with lighting restrictions or prohibitions in GSENM under Alternative A. Under Alternative B, C, D, and E, 1,865,400 acres would have lighting restrictions, but there would be no areas of lighting prohibitions. Additional narrative discussions identify other potential impacts on dark night skies associated with each alternative.

#### Impacts Common to All Alternatives

The protection, preservation, and enhancement of the dark night sky would vary among the alternatives, with varying levels of protection for dark night skies through additional protective measures and by identifying where outdoor lighting would [have restrictions](#) in GSENM. [Management direction for other resources are not expected to have impacts on dark night skies outside of the restrictions on outdoor lighting fixtures.](#)

Because the BLM does not have the ability to restrict or prohibit lighting on non-BLM-managed lands outside GSENM, impacts on dark night skies from adjacent communities would occur regardless of the

alternative selected. The communities of Kanab and Boulder have passed ordinances that seek to protect against light pollution, likely resulting in less expansion of light pollution in these areas.

#### **Alternative A**

Under Alternative A, existing trends for dark night skies would continue. The goal would be to manage uses to protect the quality of dark night sky resources through application of BMPs, as outlined in the 2020 GSENM RMPs (BLM 2020a) and the KEPA RMP (2020b). The BLM would continue to inventory and monitor night skies in partnership with local communities and stakeholders. There would be no acres within GSENM where lighting would be further restricted and where outdoor lighting would be prohibited. This alternative does not include further night-lighting restrictions or prohibit outdoor lighting in specific areas and the enhancement of dark night sky resources through additional protections would not occur. Under Alternative A, there would be no management direction to seek [International Dark Sky Place](#) status; therefore, the associated astrotourism economic benefits would not be realized.

#### **Alternative B**

Dark night skies would be more protected under Alternative B than under Alternative A. Alternative B establishes the objective to manage outdoor lighting fixtures to protect the quality of dark night skies. Specifically, outdoor lighting fixtures would only be allowed for public safety with a set of BMPs (see **Appendix C**) for any new lighting; these BMPs would analyze whether the lighting is necessary, assess lighting's impacts on the adjacent area, focus lighting only where it is needed, limit the brightness of installed lighting, only illuminate fixtures when it is useful, and use warmer-spectrum lighting.

The BLM would manage the entirety of the GSENM decision area (1,865,600 acres) where lighting would be further restricted. There would be no areas where outdoor lighting would be prohibited. Because Alternative B would introduce additional night-lighting restrictions, this alternative would further protect, preserve, and enhance dark night sky resources compared with Alternative A. Under Alternative B, the BLM would seek to acquire International Dark Sky Place status for GSENM, which would further prioritize management of dark night skies. Based on the additional status this designation would grant GSENM, there would be a potential increase in visitation and economic development opportunities associated with astrotourism to experience pristine night skies.

#### **Alternative C**

Impacts on dark night skies under Alternative C would be similar to those described under Alternative B. In addition to the effects described under Alternative B, any existing exterior artificial light fixtures would be removed, replaced, or retrofitted to meet the same BMPs, where possible.

#### **Alternative D**

Impacts on dark night skies under Alternative D would be to the same as those described under Alternative C.

#### **Alternative E**

Impacts on dark night skies under [Alternative E](#) would be the same as those described under [Alternative C](#).

### Cumulative Impacts

The cumulative impacts analysis area for dark night skies corresponds to the planning area, adjacent communities, and any other adjacent development with nighttime lighting that could produce light pollution in GSENM. Past, present, and reasonably foreseeable future actions and conditions (Appendix F, Analytical Framework) in the cumulative impacts analysis area that have and would likely continue to adversely affect dark night skies include artificial lighting associated with residential, commercial, and industrial developments, as well as some recreational activities, like camping in developed areas. Furthermore, mining and energy projects in the region with nighttime lighting, including the Alton Coal Mine, have the potential to generate light pollution within GSENM unless these projects incorporate BMPs, such as those identified in BLM Technical Note 457, to minimize these potential effects. Towns and cities adjacent to GSENM, as well as those farther away, are anticipated to continue to grow and lead to further encroachment of light pollution into the edges of GSENM.

## 3.12 NATURAL SOUNDSCAPES

### 3.12.1 Affected Environment

The natural soundscape of GSENM is important and contributes to the overall GSENM landscape. This section and Appendix I.12 discuss natural soundscapes in and around GSENM. The detail provided here and in Appendix I.12 includes existing modeled sound levels in GSENM (NPS 2021) with examples of common sounds to correlate the different sound levels (Table 3-59 and Figure 3-36 in Appendix A), sites where baseline acoustic monitoring has been conducted within GSENM (Table 3-60 and Figure 3-36 in Appendix A), and the trends and forecasts of current and future conditions of natural soundscapes in GSENM.

**Table 3-59. Existing Modeled L50 Sound Levels (A-weighted Decibels [dBA])**

| Sound Level dBA<br>(example)                                     | Acres in<br>GSENM |
|--|-------------------|
| Less than 25 dBA<br>(rustling leaves and normal human breathing) | 884,500           |
| 25–30 dBA<br>(quiet whisper and ticking watch)                   | 978,700           |
| More than 30 dBA<br>(refrigerator hum and quiet library)         | 2,500             |

Source: NPS 2021

**Table 3-60. Baseline Acoustic Monitoring Locations – Existing L50 Sound Levels (A-weighted Decibels)**

| Site Number | Site Name  | Season | Day/Night | L50 (dBA) |
|-------------|------------|--------|-----------|-----------|
| GSENM001    | Calf Creek | Fall   | Day       | 30.3      |
|             |            |        | Night     | 32.6      |
| GSENM001    | Calf Creek | Winter | Day       | 33.3      |
|             |            |        | Night     | 33.7      |
| GSENM002    | Deer Creek | Fall   | Day       | 23.8      |
|             |            |        | Night     | 31.5      |
| GSENM002    | Deer Creek | Winter | Day       | 24.2      |
|             |            |        | Night     | 24.2      |
| GSENM003    | Dry Fork   | Fall   | Day       | 16.9      |
|             |            |        | Night     | 15.6      |

| Site Number | Site Name                       | Season | Day/Night | L50 (dBA) |
|-------------|---------------------------------|--------|-----------|-----------|
| GSENM004    | Dance Hall Rock                 | Fall   | Day       | 23.2      |
|             |                                 |        | Night     | 23.0      |
| GSENM005    | Paria Townsite                  | Winter | Day       | 17.7      |
|             |                                 |        | Night     | 15.7      |
| GSENM006    | Wahweap Hoodoos                 | Winter | Day       | 20.2      |
|             |                                 |        | Night     | 15.5      |
| GSENM006    | Wahweap Hoodoos                 | Spring | Day       | 22.9      |
|             |                                 |        | Night     | 17.2      |
| GSENM007    | Lower Hackberry                 | Spring | Day       | 24.0      |
|             |                                 |        | Night     | 26.8      |
| GSENM008    | Yellow Rock                     | Summer | Day       | 20.2      |
|             |                                 |        | Night     | 33.6      |
| GSENM009    | Phipps Arch                     | Summer | Day       | 21.8      |
|             |                                 |        | Night     | 21.0      |
| GSENM010    | Willis Creek                    | Summer | Day       | 24.1      |
|             |                                 |        | Night     | 20.6      |
| GSENM010    | Willis Creek                    | Fall   | Day       | 20.7      |
|             |                                 |        | Night     | 18.7      |
| GSENM011    | Upper Escalante River           | Fall   | Day       | 30.4      |
|             |                                 |        | Night     | 31.5      |
| GSENM012    | Kaiparowits Plateau             | Fall   | Day       | 17.4      |
|             |                                 |        | Night     | 13.5      |
| GSENM012    | Kaiparowits Plateau             | Winter | Day       | 15.5      |
|             |                                 |        | Night     | 13.2      |
| GSENM013    | Devil's Garden                  | Spring | Day       | 24.0      |
|             |                                 |        | Night     | 16.0      |
| GSENM014    | No Mans Mesa                    | Spring | Day       | 26.2      |
|             |                                 |        | Night     | 24.2      |
| GSENM014    | No Mans Mesa                    | Summer | Day       | 27.1      |
|             |                                 |        | Night     | 29.7      |
| GSENM015    | Wolverine Petrified             | Fall   | Day       | 17.9      |
|             |                                 |        | Night     | 14.8      |
| GSENM015    | Wolverine Petrified             | Winter | Day       | 16.3      |
|             |                                 |        | Night     | 14.6      |
| GSENM016    | Dry Fork (sensitive microphone) | Winter | Day       | 13.4      |
|             |                                 |        | Night     | 10.0      |
| GSENM017    | Dry Fork (signage)              | Summer | Day       | 20.6      |
|             |                                 |        | Night     | 31.3      |

Source: Southern Utah University 2020

### 3.12.2 Environmental Consequences

Refer to **Section F.17**, Natural Soundscapes, in **Appendix F**, Analytical Framework, for descriptions of the indicators, analysis areas, and assumptions used for the following analysis.

#### Issue

- How would proposed management affect natural quiet soundscapes?

A 3-mile distance beyond the GSENM boundary is used as the geographic scope for natural soundscapes and is based on the attenuation of a typical OHV (75 dBA) to levels acceptable in GSENM (30 dBA). The temporal scope of the analysis is the life of the RMP. The BLM assessed impacts on soundscapes by comparing the area (in acres) where noise-producing facilities would be prohibited with existing modeled

noise levels of less than 25 dBA, 25 to 30 dBA, and more than 30 dBA across GSENM. This includes the areas where OHV use and noise-producing facilities would not be allowed under each alternative, as described in **Chapter 2** and **Table 3-61**. By identifying the acres where noise-producing facilities are prohibited, compared with the existing soundscape conditions, the extent of the soundscape protected by each alternative can be quantified, including where existing soundscapes are highly intact. This analysis does not consider the extent of OHV use in these areas, but instead focuses on the extent of protection of soundscapes through closing areas to OHV use. The assessment of impacts from drone use and aircraft landing areas is described qualitatively based on management direction associated with each alternative.

**Table 3-61. Existing Modeled L50 Sound Levels (A-weighted Decibels) and Areas Where Different Noise-Producing Facilities are Prohibited by Alternative**

| <b>Alternative Area</b>        | <b>Less than 25 dBA (Acres)</b> | <b>25–30 dBA (Acres)</b> | <b>More than 30 dBA (Acres)</b> |
|--------------------------------|---------------------------------|--------------------------|---------------------------------|
| <b>Alternative A</b>           |                                 |                          |                                 |
| No noise-generating facilities | 0                               | 0                        | 0                               |
| Closed to OHV use              | 0                               | 1,500                    | 0                               |
| <b>Alternative B</b>           |                                 |                          |                                 |
| No noise-generating facilities | 370,000                         | 474,800                  | 400                             |
| Closed to OHV use              | 441,100                         | 510,500                  | 400                             |
| <b>Alternative C</b>           |                                 |                          |                                 |
| No noise-generating facilities | 308,500                         | 398,000                  | 500                             |
| Closed to OHV use              | 615,600                         | 593,200                  | 600                             |
| <b>Alternative D</b>           |                                 |                          |                                 |
| No noise-generating facilities | 200                             | 300                      | 0                               |
| Closed to OHV use              | 749,300                         | 687,900                  | 700                             |
| <b>Alternative E</b>           |                                 |                          |                                 |
| No noise-generating facilities | 255,900                         | 355,200                  | 500                             |
| Closed to OHV use              | 615,600                         | 593,200                  | 600                             |

Source: BLM GIS 2022; NPS 2021

Additionally, to identify soundscapes most at risk, soundscape monitoring locations, developed as part of the GSENM Baseline Acoustic Monitoring Report (Southern Utah University 2020), are listed by alternative where noise-producing facilities could occur. The NPS-modeled sound level data were compared with the sound levels measured at GSENM soundscape monitoring locations to cross-check the data and acknowledge any differences between these data. Overall, the modeled sound level and monitored sound levels are within 5 dBA, which equates to being just above the perceptible difference for the average person, demonstrating that the NPS-modeled sound data provide a general sense of existing noise levels. For context, 3 dbA is the threshold for humans to identify different noise levels. It is important to note that one site, Calf Creek (site GSENM0001), was monitored to be noisier than the modeled data. Also, several sites were monitored to be quieter than the modeled data; specifically, Dry Fork (site GSENM016) measured more than 15 dBA quieter than the modeled data. Additional monitoring locations found to be quieter than the modeled data include Dance Hall Rock (site GSENM004), Paria Townsite (site GSENM005), Phipps Arch (site GSENM009), Kaiparowits Plateau (site GSENM012), Devil's Garden (site GSENM013), and Wolverine Petrified (site GSENM015).

Further narrative discussions identify other potential impacts on soundscapes associated with each alternative.

### **Impacts Common to All Alternatives**

The protection, preservation, and enhancement of natural soundscapes would vary among the alternatives with varying levels of additional protective measures and identification of where different noise-producing uses would be prohibited in GSENM. All alternatives include increasing public awareness and appreciation of—and engagement with—natural soundscape resources.

Because the BLM does not have the ability to restrict travel on rural highways (such as U.S. Highway 89 and State Route 12), noise generated along these travel corridors would continue under all alternatives; this would continue affecting GSENM soundscapes.

### **Alternative A**

Existing trends for soundscapes would continue under Alternative A. The goal would continue to be managing uses to protect the quality of natural soundscapes through application of BMPs, as outlined in the 2020 GSENM RMPs (BLM 2020a) and the KEPA RMP (2020b), with more specific direction to be included in the forthcoming natural soundscape management plan. Increasing use along primary and secondary travel routes would continue, resulting in the areas adjacent to these routes becoming less quiet over time. Additionally, the use of OHVs in open and limited use areas, as well as the ability to take off and land drones in most locations within GSENM, would continue to result in increased noise levels where these uses occur.

**Table 3-61** identifies the acres under Alternative A, by existing noise threshold, where OHV use and noise-producing facilities are prohibited; this highlights the extent of protection for existing soundscapes under this alternative. It is important to note that under Alternative A, WSAs would continue to be managed as limited OHV use areas; however, no new routes could be **designated** in these areas (and **drones can only take off and land on designated routes**), resulting in these portions of GSENM being further protected from increased noise levels beyond what is shown in **Table 3-61**. Alternative A does not identify management direction related to landing areas or landing strips for aircraft, which could lead to increased noise in GSENM soundscapes during takeoffs and landings adjacent to the one maintained airstrip in GSENM (New Home Bench airstrip). Also, because this alternative does not include the establishment of quiet hours at campgrounds, designated camping locations, and other locations, potential intermittent noise from generators associated with recreational use would continue to impact soundscapes where concentrated recreation use occurs.

Overall, proposed management actions under this alternative have the potential to impact soundscapes within GSENM because no areas are identified where noise-producing facilities are prohibited, including drone takeoffs and landings, as well as not further limiting where OHV use could occur.

Alternative A would prohibit recreational **shooting** from, on, or across highways and within 0.25 miles of residences, campgrounds, developed recreation facilities. The majority of GSENM (1,856,800 acres) would be open to recreational **shooting** and would therefore be susceptible to noise associate with **recreational shooting** that would diminish the natural soundscape.

### **Alternative B**

Existing soundscapes would be more protected under Alternative B than under Alternative A. The goal under Alternative B would be to protect the quality of natural soundscapes. To protect existing soundscapes, noise-generating facilities would be prohibited in WSAs, lands with wilderness characteristics



managed to protect those characteristics, and two RNA (ACECs). Short-term anthropogenic noise would be kept below 75 dBA, and long-term anthropogenic noise would be kept below 55 dBA (observed L50 sound level) at no more than 50 feet from the source. Alternative B would identify the establishment of quiet hours at developed campgrounds, resulting in a reduction of potential intermittent noise associated with recreation users' generators.

Alternative B would also have a requirement to install sound-attenuation features for any approved uses that generate noise. The use of OHVs in limited use areas (there are no open use areas under Alternative B) would result in increasing noise levels within these portions of GSENM. Based on management direction, increased noise levels could occur outside WSAs, lands with wilderness characteristics managed to protect those characteristics, two RNA (ACECs) in OHV limited use areas, near the following identified noise monitoring locations:

- Calf Creek (GSENM001)
- Paria Townsite (GSENM005)
- Lower Hackberry (GSENM007)
- Yellow Rock (GSENM008)
- No Mans Mesa (GSENM014)
- Wolverine Petrified (GSENM015)

**Table 3-61** identifies the acres under Alternative B, by existing noise threshold (see **Figure 3-36**, Existing Soundscape Conditions, in **Appendix A**), where OHV use and noise-producing facilities would be prohibited (OHV use under Alternative B is shown on **Figure 2-33**, Alternative B: Travel and Transportation Management, in **Appendix A**); this highlights the extent of protection for existing soundscapes under this alternative. By only allowing drones to take off or land along designated OHV routes in OHV limited areas assigned for the activity via implementation-level travel planning, Alternative B would facilitate the protection of soundscapes throughout GSENM by focusing drone use where other human-generated noise would occur. Additionally, not allowing drones to take off or land within 300 feet of recreation facilities, as well as the establishment of quiet hours at campgrounds, designated camping locations, and other locations, would further protect soundscapes where concentrated recreation use occurs. This includes potential intermittent noise from generators associated with recreational use.

Alternative B includes management direction regarding the identification of appropriate landing areas or landing strips for aircraft; however, it would not specifically prohibit any portion of GSENM from this use. Identification of additional landing areas and landing strips for aircraft could allow for increased aircraft access compared with Alternative A, resulting in a potential increase in noise levels in areas adjacent to any new proposed landing areas.

To protect natural soundscapes, existing uses that generate sounds would be retrofitted to reduce sound generated below the identified thresholds, to the extent possible, which would not be completed under Alternative A.

Alternative B would prohibit recreational shooting from, on, or across highways and within 0.25 miles of residences, campgrounds, developed recreation facilities, and in WSAs/ISAs and RNAs. These prohibitions would protect natural soundscapes mainly near WSAs and RNAs (ACECs). Compared to Alternative A, there would be 905,300 more acres prohibited to recreational shooting under Alternative C.

### **Alternative C**

Existing soundscapes would be more protected under Alternative C than under Alternative A. Like Alternative B, the goal under Alternative C would be to protect the quality of natural soundscapes. Alternative C would identify the establishment of quiet hours at developed campgrounds, resulting in a reduction of potential intermittent noise associated with recreation users' generators. To protect existing soundscapes, noise-generating facilities would be prohibited in the primitive area. Within the front country area, sound-attenuation features would be required for any approved uses that generate noise to keep short-term anthropogenic noise below 75 dBA and long-term anthropogenic noise below 55 dBA (observed L50 sound level) at no more than 50 feet from the source. For the passage and outback areas, sound-attenuation features would be required for any approved uses that generate noise, to keep noise below 10 dBA above the L90 measured background sound level at no more than 50 feet from the source. The use of OHVs in limited use areas (there are no open areas under Alternative C) would result in increasing noise levels within these areas. In particular, increased noise levels could occur near the following identified noise monitoring location:

- Calf Creek (GSENM001)

**Table 3-61** identifies the acres under Alternative C, by existing noise threshold (see **Figure 3-36**, Existing Soundscape Conditions, in **Appendix A**), where OHV use and noise-producing facilities would be prohibited (OHV use under Alternative C is shown on **Figure 2-34**, Alternative C: Travel and Transportation Management, in **Appendix A**); this highlights the extent of protection for existing soundscapes under this alternative. By not allowing drones to take off or land within 300 feet of recreation facilities in the front country and passage areas, as well as focusing drone landings and takeoffs along designated OHV routes in OHV limited areas and prohibiting takeoff and landing of drones without a permit in all outback and primitive areas, Alternative C would facilitate further protection of existing soundscapes within these management areas. Additionally, like under Alternative B, the establishment of quiet hours at campgrounds, designated camping locations, and other locations would further protect soundscapes where concentrated recreation use occurs; this includes potential intermittent noise from generators associated with recreational use.

Alternative C includes management direction regarding the identification of appropriate landing areas or landing strips for aircraft. This use would be prohibited in the GSENM primitive area, which would further protect soundscapes in these areas, compared with Alternative B. To protect natural soundscapes, existing uses that generate sounds would be retrofitted to reduce sound generated below the identified thresholds, to the extent possible.

Alternative C would prohibit recreational **shooting** in the primitive and front country areas. These prohibitions would protect natural soundscapes mainly near WSAs and RNAs (ACECs) which make up the majority of the primitive area, as well as the front country area which would protect human health and safety as this area is where most visitation occurs. Compared to Alternative A, there would be 1,159,200 more acres closed to recreational **shooting** under Alternative C.

### **Alternative D**

Existing soundscapes would be more protected under Alternative D than under Alternative A. Like Alternatives C and D, under Alternative D, the goal would be to protect the quality of natural soundscapes. Alternative D would identify the establishment of quiet hours at developed campgrounds, resulting in a

reduction of potential intermittent noise associated with recreation users' generators. To protect existing soundscapes, noise-generating facilities would be prohibited outside developed campgrounds (defined in the analysis as the area within 0.25 miles of campgrounds). The use of OHVs in limited use areas (there are no open areas under Alternative D) would result in increasing noise levels within these areas. Increased noise levels are not anticipated to occur near any of the noise monitoring locations identified in **Table 3-60**.

**Table 3-61** identifies the acres under Alternative D, by existing noise threshold (see **Figure 3-36**, Existing Soundscape Conditions, in **Appendix A**), where OHV use and noise-producing facilities would be prohibited (OHV use under Alternative D is shown on **Figure 2-35**, Alternative D: Travel and Transportation Management, in **Appendix A**); this highlights the extent of protection for existing soundscapes under this alternative. By not allowing drones to take off or land in GSENM without a permit issued by the BLM Authorized Officer, Alternative D would facilitate the protection of existing soundscapes throughout GSENM. Additionally, like Alternatives B and C, the establishment of quiet hours at campgrounds, designated camping locations, and other locations would further protect soundscapes where concentrated recreation use occurs; this includes potential intermittent noise from generators associated with recreational use.

Alternative D would include management direction regarding the identification of appropriate landing areas or landing strips for aircraft. However, it would not specifically prohibit any portion of GSENM from this use, resulting in similar impacts as Alternative B. To protect natural soundscapes, existing uses that generate sound would be retrofitted to reduce sound generated below 10 dBA above the L90 measured background sound level at no more than 50 feet from the source.

Alternative D would prohibit recreational shooting throughout GSENM, which would increase the protection of natural soundscapes. Compared to Alternative A, there would be 1,856,800 more acres closed to recreational shooting under Alternative D.

### **Alternative E**

Existing soundscapes would be more protected under Alternative E than under Alternative A. Like Alternative B, the goal under Alternative E would be to protect the quality of natural soundscapes. Alternative E would establish quiet hours at developed campgrounds, resulting in a reduction of potential intermittent noise associated with recreation users' generators. To protect existing soundscapes, noise-generating facilities would be prohibited in the primitive area. Within the front country area, sound-attenuation features would be required for any approved uses that generate noise to keep short-term anthropogenic noise below 75 dBA and long-term anthropogenic noise below 55 dBA (observed L50 sound level) at no more than 50 feet from the source. For the passage and outback areas, sound-attenuation features would be required for any approved uses that generate noise, to keep noise below 10 dBA above the L90 measured background sound level at no more than 50 feet from the source. The use of OHVs in limited use areas (there are no open areas under Alternative E) would result in increasing noise levels within these areas. In particular, increased noise levels could occur near the Calf Creek (GSENM001) noise monitoring location.

**Table 3-61** identifies the acres under Alternative E, by existing noise threshold (see **Figure 3-36**, Existing Soundscape Conditions, in **Appendix A**), where OHV use and noise-producing facilities would be prohibited. (OHV use under Alternative E is shown in **Figure 2-36**, Alternative E: Travel and

Transportation Management, in **Appendix A.**) This highlights the extent of protection for existing soundscapes under this alternative. By not allowing drones to take off or land within 300 feet of recreation facilities in the front country, passage, and outback areas, as well as focusing drone landings and takeoffs along designated OHV routes in OHV limited areas and prohibiting takeoff and landing of drones without a permit in all primitive areas, Alternative E would facilitate further protection of existing soundscapes within these management areas. Additionally, like under Alternative B, the establishment of quiet hours at campgrounds, designated camping locations, and other locations would further protect soundscapes where concentrated recreation use occurs; this includes potential intermittent noise from generators associated with recreational use.

Alternative E includes management direction regarding the identification of appropriate landing areas or landing strips for aircraft. This use would be prohibited in the GSENM primitive area, which would further protect soundscapes in these areas, compared with Alternative B. Until a new travel management planning has been completed, the Boulder/New Home Bench Airstrip would remain available for motorized aircraft use, increasing potential impacts on adjacent soundscapes compared to Alternative B. To protect natural soundscapes, existing uses that generate sounds would be retrofitted to reduce sound generated below the identified thresholds, to the extent possible.

Alternative E would prohibit recreational shooting in the front county areas as well as prohibit recreational shooting within 600 feet of archaeological and historic resources in all areas. Additionally, recreational shooting would be prohibited within 600 feet of residences, campgrounds, and developed recreation facilities within the passage, outback, and primitive areas. These prohibitions would protect natural soundscapes near recreation areas as well as within the front country area, which would protect human health and safety as this is where most visitation occurs. Impacts on soundscapes in and near WSAs and RNAs (ACECs), which make up the majority of the primitive area, would be elevated compared to management under other action alternatives because recreational shooting would not be prohibited in these areas. Compared with Alternative A, there would be 154,200 more acres closed to recreational shooting under Alternative E.

### **Cumulative Impacts**

The cumulative impacts analysis area for natural soundscapes corresponds to the planning area and the area within 3 miles of the planning area. Past, present, and reasonably foreseeable future actions and conditions (**Appendix F**, Analytical Framework) in the cumulative impacts analysis area that have and would likely continue to adversely affect natural soundscapes include recreation uses (for example, OHVs or generators at recreation sites); air travel, including scenic overflights; travel along primary and secondary corridors; and drone use for recreational and scientific purposes. Additionally, proposed utility ROWs, mineral extraction, and road construction projects, including the Lake Powell Pipeline and Skutumpah Road paving, would generate additional noise during their construction and operation in and adjacent to GSENM.

Implementation of air tour management plans for adjacent NPS units could result in increased, additive noise along the periphery of GSENM where GSENM is within 0.5 miles of Bryce Canyon National Park, Capitol Reef National Park, and Glen Canyon. The Bryce Canyon Air Tour Management Plan (NPS 2022) identified fixed-wing and helicopter routes across the northwest corner of GSENM; this could result in potential increased noise in the areas west of Cannonville and the Skutumpah Road, near Bryce Canyon National Park, during scenic overflights.

### 3.13 FIRE AND FUELS MANAGEMENT

#### 3.13.1 Affected Environment

This section summarizes, and **Appendix I.13** describes in detail, the current conditions, trends, and forecasts of fire and fuels management in the GSENM. Current and desired fire and fuels conditions are described by fire regime groups (FRGs)<sup>13</sup> and vegetation condition classes (VCCs)<sup>14</sup>. Most acres in GSENM are in FRGs I, II, and V. The dominance of FRGs I, II, and V, along with the vegetation types found in these groups, is predictive of future mixed-severity, large-scale wildfire. Sixty percent of vegetation in GSENM is moderately or highly departed from (VCC class IIA and IIB) historical fire conditions as less fire occurs now compared with historical conditions. Fuel loading because of fire suppression has increased the susceptibility of vegetation and other resources to large-scale, catastrophic fires. **Due to past and current climate conditions and fire suppression, fuel loads have increased across broad portions of GSENM.** The number of fuels projects in GSENM has increased in recent years. **In summary, sagebrush-steppe landscapes have shifted toward landscapes with higher cover of woodlands and invasive annual grasses, increasing fuel loads above historical levels. Fuels projects provide** for resilient and resistant landscapes by restoring and/or improving the VCC; **protect** fire-adapted communities by reducing fire hazard, with an emphasis on wildland-urban interface areas; and **improve** safe and effective wildfire response. **Fuels projects** have mainly included mechanical **treatments** (hand thinning, hand piling, harrow, Ely chaining, and mechanical mulching). Seeding is used in conjunction with each treatment, where appropriate.

Prescribed **fire** has played a limited role in GSENM over the past 20 years. The largest factor that makes it difficult to plan prescribed burns is increased and unnatural fuel **loading**, as described above. Prescribed fire has only been used on a total of 1,273 acres in GSENM over the past 20 years (BLM GIS 2022). Typically, mechanical vegetation management are required to bring fuel conditions closer to historical conditions prior to implementing the use of prescribed fire.

Based on prolonged drought conditions and invasive species establishment, the BLM anticipates that the potential for uncharacteristic wildfire effects will continue under present management. It is also anticipated that, under continued management, live and dead fuel **loadings** in forest stands and conifer and juniper expansion into aspen and higher-elevation sagebrush communities will continue, increasing the risk for wildfires with potentially uncharacteristic fire effects. Management actions to reduce fire severity, including hazardous fuel reductions and emergency stabilization and rehabilitation, could slow resource decline.

#### 3.13.2 Environmental Consequences

Refer to **Section F.18**, Fire and Fuels Management, in **Appendix F**, Analytical Framework, for descriptions of the indicators, analysis areas, and assumptions used for the following analysis.

---

<sup>13</sup> A classification of fire regimes into a discrete number of categories based on frequency and severity. The national, coarse-scale classification of fire regime groups commonly used includes five groups: I - frequent (0–35 years), low severity; II - frequent (0–35 years), stand replacement severity; III - 35–100+ years, mixed severity; IV - 35–100+ years, stand replacement severity; and V - 200+ years, stand replacement severity (National Wildfire Coordinating Group 2022).

<sup>14</sup> VCC indicates the general level to which current vegetation is different from the estimated historical vegetation conditions (LANDFIRE 2022). Historical conditions are generally considered to be prior to Euro-American contact.

**Issues**

- How would land use allocations and discretionary [actions](#) affect fire and fuels?
- How would vegetation management actions affect fire and fuels?

**Impacts Common to All Alternatives**

Regardless of the alternative, the effects of climate change would likely combine with and exacerbate some effects that result from implementing the alternatives. This, in turn, would affect fire and fuels. The planning area is expected to experience an increase in fire risk as climate trends continue and become more pronounced. Fire frequency is expected to increase as a result of warmer temperatures, higher fuel, and longer fire seasons. Fire severity is also expected to increase as a result of more extreme fire weather, dryer fuels and higher fuel loading.

Increased fire frequency and fire size in high-severity fire regimes (primarily FRGs II and V, typically [sagebrush](#) and sagebrush communities that have been encroached on by pinyon and juniper trees, and stable pinyon-[juniper](#) woodlands) could increase the amount of vegetation-type conversion to communities dominated by invasive annual grasses, lowering ecological resilience from future disturbance.

Because the effects on fire and fuels from weather and changing climate would not vary substantially across alternatives, this is not discussed further.

[Air Quality management will be the same across all alternatives including regarding management of prescribed fires.](#)

[Landscape-scale vegetation management to restore functional vegetative communities would continue to be done on a project-by-project basis. Where treatments were done in areas where the VCC is the most departed from historical conditions, treatments would incidentally reduce woody fuel loads, and reduce the risk of uncharacteristic wildland fire.](#)

A full suite of options for fire response (including, but not limited to, hand crews, dozers, and engines), would be available to the BLM under all alternatives. However, differing management prescriptions and allocations under each alternative may dictate how response is carried out in certain areas. For example, fire response in a highly protective land management allocation may require more reliance on hand crews and other nonmotorized or [minimum-impact response tactics](#), which may increase response complexity. More detail is provided in the analyses below.

[Where possible, the BLM could allow natural-caused wildland fire to function in its natural ecological role to protect, maintain, and enhance resources. As described in the \*Affected Environment, Trends\*, numerous fire-adapted vegetation communities are in the decision area, including grasslands, \[sagebrush\]\(#\), mountain shrub, aspen, and mixed conifer forests. Where allowed to burn in these communities, fire would be expected to reduce excess woody and fine fuels, stimulate growth of fire-adapted vegetation, and help maintain ecological conditions and functions. This would help maintain the VCC and FRG at or close to historical conditions. Due to hazardous fuel loads in some areas, allowing a naturally ignited fire to burn for resource benefits may not be appropriate without mechanical pre-treatment to reduce fuels. This may be the case in sagebrush communities that have been encroached on by pinyon and juniper trees or in areas that have been invaded by invasive annual grasses.](#)

The BLM would not allow natural-caused wildland fire to burn, and would instead respond to wildland fire with suppression, where suppression would protect life and property, prevent uncharacteristic wildland fire in native habitats, and protect special status species habitat and GSENM objects from uncharacteristic wildland fire. In these cases, the resources listed would remain unchanged, but excess woody and fine fuels would also remain, if present, continuing the risk for uncharacteristic wildland fire in these areas.

Post-fire rehabilitation activities are evaluated on a case-by-case basis and would be done under all alternatives, though the priorities and methods used under each alternative would differ. Evaluation considers the structure and diversity of vegetation before fire, the presence of noxious weeds in the area, and the likelihood that noxious weeds would increase as a result of fire. Using native species for post-fire seeding is a GSENM priority, but nonnative species may be used for post-fire soil stabilization or seeding if the area is threatened by species with high invasive potential. Carrying out emergency stabilization and rehabilitation after wildland fire may lower the potential that burned areas would become dominated by invasive annual grasses, though success or failure of restoration likely depends on multiple site variables, including soil moisture and nutrient content, pre-fire native and invasive plant cover, and biological soil crust presence (Evangelista et al. 2004). Where rehabilitation effects are successful, maintenance of native plant richness and cover would help maintain the VCC and FRG of burned areas.

Management directions for other resources and resource uses across the alternatives may affect fire and fuels in GSENM. These are discussed in more detail below.

Soil management directions would contain measures to stabilize soils and minimize the potential for surface water runoff during and after projects. For example, minimization measures would be in place on slopes (10 to 15 percent) and in areas of vulnerable soils, such as areas with biological soil crusts, and actions would generally be prohibited on steep slopes (30 percent or more). These measures and prohibitions may affect the location where proactive vegetation and fuel reduction treatments could be carried out, as well as the methods the BLM uses to carry out the treatments. As a result, proactive vegetation treatments may be carried out in fewer areas, resulting in slower movement toward desired VCC and the continued potential for uncharacteristically large and severe fire, especially in areas of slopes or other vulnerable soils.

The BLM would manage 559,600 acres of lands with wilderness characteristics across all alternatives, but the management prescriptions would change under each alternative. The number of acres of vegetation in each VCC that would be in each type of management prescription under the alternatives is summarized in **Table 3-62**, VCCs in Lands with Wilderness Characteristics.

In general, managing for more conservative or protective allocations (to protect lands with wilderness characteristics while providing for compatible uses) may reduce the number of human-caused fire ignitions and number of acres burned over time. This would occur because there would be less recreation in these areas, especially motorized recreational activities that are more likely to result in ignitions. When a fire burns in these areas, such protective allocations may make responses more complex or difficult. For instance, response may need to rely more heavily on hand crews, as dozers, engines, or other motorized response may be limited. Conversely, allowing for multiple uses while not protecting lands with wilderness characteristics may increase the number of human-caused ignitions and acres burned in these areas. This prescription may lower response complexity, as a full range of response options would likely be available. Additional analysis is provided under each alternative below.

**Table 3-62. Vegetation Condition Classes in Lands with Wilderness Characteristics**

| Alternative | Vegetation Condition Class  | Protect lands with wilderness characteristics while providing for compatible uses (Acres and Percent) | Minimize impacts on wilderness characteristics while emphasizing other uses (Acres and Percent) | Allow for other uses while not protecting lands with wilderness characteristics (Acres and Percent) |
|-------------|-----------------------------|---|---|---|
| A           | IA                          | —   | —   | 41,300 (7)  |
|             | IB                          | —   | —   | 115,600 (21)  |
|             | IIA                         | —   | —   | 260,500 (47)  |
|             | IIB                         | —   | —   | 57,100 (10)   |
|             | IIIA                        | —   | —   | 6,800 (1)   |
|             | Other <sup>1</sup>          | —   | —   | 78,200 (14)   |
|             | <b>Total, Alternative A</b> | <b>—</b>  | <b>—</b>  | <b>559,400 (100)</b>  |
| B           | IA                          | 3,200 (4)   | —   | 38,100 (8)  |
|             | IB                          | 8,600 (12)  | —   | 107,100 (22)  |
|             | IIA                         | 35,200 (49)   | —   | 225,300 (46)  |
|             | IIB                         | 4,800 (7)   | —   | 52,200 (11)   |
|             | IIIA                        | 900 (1)   | —   | 5,900 (1)   |
|             | Other <sup>1</sup>          | 19,400 (27)   | —   | 58,700 (12)   |
|             | <b>Total, Alternative B</b> | <b>72,000 (100)</b>   | <b>—</b>  | <b>487,400 (100)</b>  |
| C           | IA                          | 12,200 (4)  | 28,900 (9)  | 100 (4)   |
|             | IB                          | 44,300 (14)   | 69,700 (24)   | 1,600 (23)  |
|             | IIA                         | 111,700 (56)  | 146,300 (42)  | 2,500 (27)  |
|             | IIB                         | 18,600 (8)  | 37,700 (11)   | 800 (15)  |
|             | IIIA                        | 4,300 (2)   | 2,400 (1)   | —   |
|             | Other <sup>1</sup>          | 49,500 (17)   | 27,800 (12)   | 1,100 (31)  |
|             | <b>Total, Alternative C</b> | <b>240,600 (100)</b>  | <b>312,800 (100)</b>  | <b>6,100 (100)</b>  |
| D           | IA                          | 41,300 (7)  | —   | —   |
|             | IB                          | 115,600 (21)  | —   | —   |
|             | IIA                         | 260,500 (47)  | —   | —   |
|             | IIB                         | 57,100 (10)   | —   | —   |
|             | IIIA                        | 6,800 (1)   | —   | —   |
|             | Other <sup>1</sup>          | 78,200 (14)   | —   | —   |
|             | <b>Total, Alternative D</b> | <b>559,400 (100)</b>  | <b>—</b>  | <b>—</b>  |
| E           | IA                          | 18,300 (4)  | 22,800 (9)  | 100 (4)   |
|             | IB                          | 62,400 (14)   | 51,600 (24)   | 1,600 (23)  |
|             | IIA                         | 156,300 (56)  | 101,700 (42)  | 2,500 (27)  |
|             | IIB                         | 27,100 (8)  | 29,200 (11)   | 800 (15)  |
|             | IIIA                        | 5,000 (2)   | 1,800 (1)   | —   |
|             | Other <sup>1</sup>          | 60,300 (17)   | 16,900 (12)   | 1,100 (31)  |
|             | <b>Total, Alternative E</b> | <b>329,300 (100)</b>  | <b>224,100 (100)</b>  | <b>6,100 (100)</b>  |

Source: BLM GIS 2022

<sup>1</sup> Other includes areas mapped as agriculture, developed, barren or sparse, and water



Continuing to monitor for and control invasive plant species and noxious weeds using an integrated weed management program and early detection and rapid response actions would slow the establishment and spread of weeds in the planning area. Where control treatments were carried out, woody- and fine-fuel loading would be reduced, lessening the risk for uncharacteristically large, severe fire and movement of the VCC away from historical conditions in burned areas. The alternatives would generally limit or prohibit discretionary surface-disturbing actions (such as surface-disturbing mechanical vegetation treatments) within 330 of riparian areas, so invasive plant control would likely be primarily used to reduce fuels in riparian areas.

As discussed in the *Affected Environment* section, prior to Euro-American contact, periodic naturally and Native American-ignited fires maintained a mosaic of vegetation types and prevented woody fuels from accumulating to hazardous levels. After Euro-American contact but before grazing became regulated with the passage of the Taylor Grazing Act in 1934, the planning area was likely overgrazed by cattle, which reduced fine fuels to the point that fire no longer carried across the landscape. This, among other factors like fire suppression, may have contributed to pinyon-juniper expansion, infilling, woody fuel accumulation, and current departures in VCC and FRG.

Administering livestock grazing to meet the BLM Utah Rangeland Health Standards, as well as management direction to rest revegetated areas from grazing until seedings are established, would continue under all alternatives, though the allocations, including the AUMs and acres available for livestock grazing, would differ under each alternative. Livestock grazing alone would be unlikely to substantially affect the VCC or FRG in the planning area. While targeted grazing may lower fine-fuel loadings due to livestock consumption of annual and perennial grasses and forbs, livestock grazing support activities like range improvement construction and maintenance and trailing also contribute to fine-fuel loadings via weed establishment and spread. Further, current VCCs and FRGs in the planning area are primarily driven by the presence or absence of woody fuels, as described above, particularly when they accumulate to hazardous levels. Because livestock grazing allocations would differ under each alternative, the extent to which livestock grazing would be anticipated to alter fine-fuel loadings would also differ under each alternative. However, for the reasons above, livestock grazing is not anticipated to have substantial or varying effects on VCCs and FRGs under the different alternatives, and is therefore not analyzed further in this section.

The number of acres of vegetation in each VCC that would be in each type of ROW allocation under the alternatives is summarized in **Table 3-63**, Vegetation Condition Classes in Right-of-way Allocations. Generally, maintaining existing ROW corridors would result in continued or increased potential for human-caused fire ignitions and potentially the number of acres burned in resulting fires. This would come about for several reasons. First, developing transmission or other linear ROWs involves ground disturbance, which can increase the potential for establishment and spread of invasive plant species. Often, these ROWs include maintenance roads, which can facilitate weed spread across relatively long distances within the corridor, either from natural processes, like wind and water transport of weed seeds, or from weed seeds being transported by maintenance and recreational vehicles that use these roads. The combination of increased vehicle use in these areas and increased cover of fine fuels from invasive plants would also increase the potential for human-caused fire ignitions. The risk would increase with the number of authorized ROWs in the corridor as ground disturbance, weed spread, and vehicle use increases. The potential for these effects may be highest where ROWs are located in areas where vegetation is most departed from historical conditions, as these areas would generally have the highest fuel loads.

Table 3-63. Vegetation Condition Classes in Right-of-way Allocations

| Alternative | Vegetation Condition Class  | ROW Open (Acres and Percent) | ROW Avoidance <sup>1</sup> (Acres and Percent) | ROW Exclusion (Acres and Percent) |
|-------------|-----------------------------|------------------------------|--|-----------------------------------|
| A           | IA                          | 45,300 (7)                   | 9,500 (3)                                      | 41,500 (5)                        |
|             | IB                          | 134,500 (21)                 | 42,500 (13)                                    | 104,900 (12)                      |
|             | IIA                         | 288,500 (47)                 | 176,800 (53)                                   | 408,000 (46)                      |
|             | IIB                         | 102,500 (16)                 | 32,900 (10)                                    | 62,200 (7)                        |
|             | IIIA                        | 7,200 (1)                    | 4,700 (1)                                      | 11,300 (1)                        |
|             | Other <sup>2</sup>          | 52,100 (8)                   | 66,100 (20)                                    | 253,100 (29)                      |
|             | <b>Total, Alternative A</b> | <b>630,100 (100)</b>         | <b>332,600 (100)</b>                           | <b>881,100 (100)</b>              |
| B           | IA                          | 2,600 (3)                    | 47,800 (5)                                     | 45,900 (6)                        |
|             | IB                          | 12,900 (15)                  | 158,300 (18)                                   | 111,100 (12)                      |
|             | IIA                         | 35,400 (42)                  | 399,500 (50)                                   | 444,500 (45)                      |
|             | IIB                         | 13,200 (16)                  | 118,400 (14)                                   | 66,500 (6)                        |
|             | IIIA                        | 1,100 (12)                   | 9,700 (1)                                      | 12,500 (1)                        |
|             | Other <sup>1</sup>          | 19,800 (23)                  | 87,400 (12)                                    | 265,100 (30)                      |
|             | <b>Total, Alternative B</b> | <b>85,000 (100)</b>          | <b>821,000 (100)</b>                           | <b>945,600 (100)</b>              |
| C           | IA                          | 0 (<1)                       | 35,700 (5)                                     | 60,500 (6)                        |
|             | IB                          | 2,600 (24)                   | 123,300 (17)                                   | 156,000 (13)                      |
|             | IIA                         | 2,400 (22)                   | 337,700 (51)                                   | 533,800 (44)                      |
|             | IIB                         | 3,400 (31)                   | 110,400 (15)                                   | 83,900 (6)                        |
|             | IIIA                        | 200 (2)                      | 6,200 (1)                                      | 16,800 (2)                        |
|             | Other <sup>1</sup>          | 2,200 (20)                   | 57,800 (11)                                    | 312,200 (29)                      |
|             | <b>Total, Alternative C</b> | <b>10,900 (100)</b>          | <b>671,200 (100)</b>                           | <b>1,163,300 (100)</b>            |
| D           | IA                          | <100 (<1)                    | 4,000 (2)                                      | 92,300 (5)                        |
|             | IB                          | 300 (13)                     | 40,200 (18)                                    | 241,500 (15)                      |
|             | IIA                         | 700 (30)                     | 105,900 (42)                                   | 767,400 (48)                      |
|             | IIB                         | 100 (4)                      | 60,300 (24)                                    | 137,300 (9)                       |
|             | IIIA                        | <100 (<1)                    | 3,100 (2)                                      | 20,100 (1)                        |
|             | Other <sup>1</sup>          | 1,300 (57)                   | 21,300 (11)                                    | 349,600 (21)                      |
|             | <b>Total, Alternative D</b> | <b>2,300 (100)</b>           | <b>234,800 (100)</b>                           | <b>1,608,300 (100)</b>            |
| E           | IA                          | <100 (<1)                    | 29,800 (5)                                     | 66,500 (6)                        |
|             | IB                          | 2,600 (24)                   | 102,500 (17)                                   | 176,800 (13)                      |
|             | IIA                         | 2,400 (22)                   | 295,700 (51)                                   | 575,800 (45)                      |
|             | IIB                         | 3,400 (31)                   | 101,700 (17)                                   | 92,600 (6)                        |
|             | IIIA                        | 200 (2)                      | 5,700 (1)                                      | 17,400 (2)                        |
|             | Other <sup>1</sup>          | 2,200 (20)                   | 47,400 (8)                                     | 322,500 (29)                      |
|             | <b>Total, Alternative E</b> | <b>10,900 (100)</b>          | <b>582,900 (100)</b>                           | <b>1,251,600 (100)</b>            |

Source: BLM GIS 2022

<sup>1</sup> Other includes areas mapped as agriculture, developed, barren or sparse, and water<sup>2</sup> Does not include seasonal habitat avoidance areas

On the other hand, properly maintained ROWs may also serve as fuel breaks. Fuel breaks can improve firefighter safety and provide anchor points for fire suppression activities, expand opportunities to control wildfires, and create buffers for maintaining important habitats (BLM 2020). This may result in fewer acres burned in wildfires. Fuel breaks may also offer greater protection to human life and property and habitat restoration investments and slow the spread of invasive annual grasses that can become dominant after fire, helping to maintain the VCC.

Managing ROW exclusion, avoidance, and open areas under each alternative would also affect the potential for human-caused fire ignitions and acres burned. Generally, in ROW open and avoidance areas, the BLM may authorize linear or site ROWs, which would have effects similar to those described above. In ROW exclusion areas, the BLM would not authorize ROWs except on a site-by-site basis for minimum emergency services. Resulting increases in the potential for human-caused fire ignitions, and acres burned, are not expected in these areas.

Providing opportunities to develop solar, wind, and other renewable energy sources would have similar effects as described above for ROW development, because ROW allocations would apply to renewable energy development. However, the scale and magnitude of effects from renewable energy development would be smaller than utility-scale development. This is because utility-scale development would not be allowed in GSENM; rather, renewable energy development would be limited to small-scale energy sources to power GSENM facilities.

The BLM would manage 224.2 miles of suitable river segments under the alternatives, though the river segment classifications would vary slightly between Alternative A and the action alternatives (there would be about 23.2 more miles of wild- and 23.2 fewer miles of recreational-classified segments under Alternatives B, C, D, and E; this would be the Upper Paria River segment #1, and Lower Sheep Creek). In general, management of wild-classified segments would include restrictions for other types of land use, primarily ROWs. This may reduce the number of ROWs that are proposed or developed in and near WSR segments over time and also reduce the number of human-caused fire ignitions and number of acres burned over time. However, when a fire burns in these areas, such protective allocations may make response more complex or difficult. For instance, response may need to rely more heavily on hand crews, as bulldozers, engines, or other motorized response may be prohibited.

The BLM would manage 881,100 acres of WSAs and ISAs across all alternatives (BLM GIS 2022). Managing WSAs/ISAs would affect fire risk and fuel loads in a similar manner as managing to protect lands with wilderness characteristics and preserve ORVs in wild-classified WSR segments. In summary, the number of human-caused fire ignitions and number of acres burned over time would be reduced in these areas due to less motorized recreation, but fire response may be more complex or difficult due to limitations on available response methods. The potential for these effects may be highest where WSAs/ISAs are located in areas where fuel loading is most departed from historical conditions—in VCCs IIA, IIB, and IIIA. **Table 3-64** summarizes the acres of each VCC that would be managed in WSAs/ISAs. As shown in the table, 46 percent of WSA/ISA areas would encompass vegetation that is moderately departed from historical conditions (VCC IIA), and 8 percent would encompass vegetation that is moderately to highly departed (VCC IIB and IIIA).

**Table 3-64. Vegetation Condition Classes in Wilderness Study Areas and Instant Study Areas**

| <b>Vegetation Condition Class</b> | <b>WSA and ISA<br/>(Acres and Percent)</b> |
|-----------------------------------|--|
| IA                                | 41,600 (5)                                 |
| IB                                | 104,900 (12)                               |
| IIA                               | 407,800 (46)                               |
| IIB                               | 62,300 (7)                                 |
| IIIA                              | 11,300 (1)                                 |
| Other <sup>1</sup>                | 253,100 (29)                               |
| <b>Total</b>                      | <b>881,100 (100)</b>                       |

Source: BLM GIS 2022

<sup>1</sup> Other includes areas mapped as agriculture, barren or sparse, and water

Preserving and protecting the integrity, setting, and context of [cultural](#) resources may increase the complexity of [carrying out fuels reduction projects as well as](#) appropriate fire response when fires burn in the vicinity of these resources. For example, certain types of [mechanical treatments and](#) suppression response, particularly those that disturb the ground surface, are likely incompatible with preservation guidance for these resources. Guidance is provided by BLM resource advisors and archaeologists involved with the fire response. As a result, incorporating preservation guidance into [vegetation treatment planning and](#) fire response in these areas may [reduce the areas that are treated, or](#) complicate response or preclude certain suppression activities. In some cases, this could result in [slower pace and scale towards desired VCC conditions, and](#) more acres being burned [when fires are ignited near resources](#), but the overall effects would be relatively minor and localized to the site vicinity.

Maintaining and improving the biological integrity and connectivity of terrestrial and aquatic wildlife habitats and populations, including special status species [and critical habitats for listed species](#), would incidentally maintain, and in some cases improve, fuel loading conditions, vegetation community climate resiliency, and fire response. This would happen because in most cases wildlife and special status species habitat-improvement projects would move vegetation conditions toward desired conditions; often, this would include reducing uncharacteristic fuel loading to improve habitat resilience, such as in sagebrush communities that have been encroached by pinyon and juniper trees.

The BLM would carry out management to maintain or improve forest and woodland health and reduce the potential for catastrophic wildfire under all alternatives. Where management is carried out, VCC and FRG would be maintained or moved toward historical conditions. When fires ignited or burned into these areas, such conditions may facilitate response efficiency.

[BLM would ensure that smoke generated during prescribed burning conforms with the Utah Smoke Management Plan and are timed for maximum smoke dispersal, would limit the time and duration that prescribed burning would be allowable.](#)

Providing recreational opportunities to meet recreational demands, which are expected to continue to increase over time, would increase the potential for human-caused ignitions and acres burned in resulting fires. This would happen because certain forms of recreation, including motorized recreational activities, campfires, [and recreational shooting](#), increase the likelihood of human-caused ignitions. Campfire use recommendations, such as having campfires in fire grates or on fire pans or blankets and removing ash, could reduce, but would not remove, the potential for human-caused ignitions from campfires, [as would](#)

BLM Utah guidance on certain kinds of ammunition and prohibition of incendiary targets<sup>15</sup> that are more likely to ignite fires under certain environmental conditions (Finney et al. 2013; Finney et al. 2019). As such, there would be an increased need to implement fuels reduction treatments in popular recreation areas to protect life, property, and other values at risk from the effects of uncharacteristically large and severe fire, should one be ignited in these areas.

These effects would be concentrated in RMAs as recreational use would be concentrated in these areas. RMAs with vegetation conditions that are most departed from historical conditions may have the greatest potential to be affected. The acres of VCCs in ERMAs and SRMAs that would be managed under each alternative are summarized in **Table 3-65, Vegetation Condition Classes in Recreation management Areas.**

Similarly, allowing OHV use on designated GSENM routes—especially those that traverse areas with departed vegetation conditions—would increase the potential for human-caused ignitions and increase the potential for number of acres burned in resulting fires.

**Table 3-65. Vegetation Condition Classes in Recreation Management Areas**

| Alternative | Vegetation Condition Class  | ERMAs (Acres and Percent) | SRMAs (Acres and Percent) |
|-------------|-----------------------------|---------------------------|---------------------------|
| A           | IA                          | 91,000 (5)                | 5,300 (8)                 |
|             | IB                          | 262,300 (15)              | 20,500 (30)               |
|             | IIA                         | 876,300 (49)              | 14,900 (22)               |
|             | IIB                         | 191,400 (11)              | 7,200 (11)                |
|             | IIIA                        | 21,800 (1)                | 1,500 (2)                 |
|             | Other <sup>1</sup>          | 354,200 (20)              | 18,200 (27)               |
|             | <b>Total, Alternative A</b> | <b>1,797,100 (100)</b>    | <b>67,500 (100)</b>       |
| B           | IA                          | 95,200 (5)                | 1,100 (1)                 |
|             | IB                          | 267,300 (15)              | 15,200 (16)               |
|             | IIA                         | 867,400 (49)              | 24,400 (26)               |
|             | IIB                         | 194,400 (11)              | 4,400 (5)                 |
|             | IIIA                        | 22,100 (1)                | 1,200 (1)                 |
|             | Other <sup>1</sup>          | 323,000 (18)              | 48,900 (51)               |
|             | <b>Total, Alternative B</b> | <b>1,769,400 (100)</b>    | <b>95,200 (100)</b>       |
| C           | IA                          | 32,400 (7)                | 8,200 (2)                 |
|             | IB                          | 73,300 (15)               | 60,900 (15)               |
|             | IIA                         | 223,800 (46)              | 148,400 (35)              |
|             | IIB                         | 88,700 (18)               | 20,600 (5)                |
|             | IIIA                        | 4,600 (1)                 | 4,300 (1)                 |
|             | Other <sup>1</sup>          | 63,500 (13)               | 174,900 (42)              |
|             | <b>Total, Alternative C</b> | <b>486,200 (100)</b>      | <b>417,200 (100)</b>      |
| D           | IA                          | 3,900 (1)                 | 4,100 (4)                 |
|             | IB                          | 45,500 (15)               | 12,700 (13)               |
|             | IIA                         | 121,200 (39)              | 26,100 (26)               |
|             | IIB                         | 14,600 (5)                | 5,600 (6)                 |
|             | IIIA                        | 3,300 (1)                 | 900 (1)                   |
|             | Other <sup>1</sup>          | 123,400 (40)              | 50,800 (51)               |
|             | <b>Total, Alternative D</b> | <b>311,900 (100)</b>      | <b>100,200 (100)</b>      |

<sup>15</sup> Information on recreational shooting restrictions is available on the BLM's internet website: [https://www.blm.gov/programs/recreation/utah/recreational\\_shooting](https://www.blm.gov/programs/recreation/utah/recreational_shooting).

| Alternative | Vegetation Condition Class  | ERMAs (Acres and Percent) | SRMAs (Acres and Percent) |
|-------------|-----------------------------|---------------------------|---------------------------|
| E           | IA                          | 32,400 (7)                | 8,200 (2)                 |
|             | IB                          | 73,300 (15)               | 60,900 (15)               |
|             | IIA                         | 223,700 (46)              | 148,400 (35)              |
|             | IIB                         | 88,700 (18)               | 20,600 (5)                |
|             | IIIA                        | 4,600 (1)                 | 4,300 (1)                 |
|             | Other <sup>1</sup>          | 63,500 (13)               | 174,900 (42)              |
|             | <b>Total, Alternative E</b> | <b>486,200 (100)</b>      | <b>417,200 (100)</b>      |

Source: BLM GIS 2022

<sup>1</sup> Other includes areas mapped as agriculture, developed, barren or sparse, and water

### Alternative A

The effects on fire and fuels from management direction specific to fire and fuels management contained under Alternative A would be as described under Impacts Common to All Alternatives.

The effects on fire and fuels from management directions under Alternative A for other resources and resource uses are described below.

Developing water sources in remote areas for recreation and livestock use may encourage increased human and livestock presence across GSENM. Along with this, would come the increased potential for invasive plant establishment and spread, of particular annual herbaceous plants that would provide fine fuels, as discussed under Impacts Common to All Alternatives. As a result, the potential for human-caused wildfire ignition would be increased.

The number of acres of VCCs that would be in each type of lands with wilderness characteristics management prescription under the alternatives, including Alternative A, is summarized in **Table 3-62, Vegetation Condition Classes in Lands with Wilderness Characteristics**. Under Alternative A, managing lands with wilderness characteristics for multiple uses without applying provisions to specifically protect wilderness characteristics may increase the potential that VCC in these areas may move away from historical conditions or become more departed. This would happen because the potential for fires would likely be higher, as discussed under *Impacts Common to All Alternatives*. The potential for these effects may be highest where vegetation is most departed from historical conditions, as these areas would provide potentially hazardous levels of fuels, would be at greatest risk of burning with uncharacteristic severity, and would have the greatest potential to become further departed after fire. As shown in **Table 3-62**, about 57 percent of acres of lands with wilderness characteristics would encompass vegetation that is moderately departed from historical conditions (VCC IIA) or moderately to highly departed (VCC IIB).

Continuing to protect, enhance, and restore vegetation communities in accordance with ecological site potential would help maintain vegetation community ecological processes and functions where management is carried out. In these areas, the VCC could initially move toward historical conditions – that is, the amount of departure from historical conditions would decrease in these areas. However, as climate and fire trends become more pronounced, it is likely that the resilience of treated vegetation communities would decrease unless specific consideration is given to increasing climate resiliency. Areas with decreased resiliency would be at heightened risk for uncharacteristically large, severe fire, likely increasing the acres burned over time. In burned areas, increased potential for invasive annual grass establishment would move the VCC further from historical conditions.

The number of acres of VCCs that would be in each type of ROW allocation under the alternatives is summarized in **Table 3-63**, Vegetation Condition Classes in Rights-of-way Allocations. Under Alternative A, 630,400 acres would be managed as open to ROWs; 64 percent of these acres would encompass VCCs that are moderately to highly departed from historical conditions, increasing the potential for human-caused fire and affecting the acres burned in wildfires, for the reasons described in *Impacts Common to All Alternatives*. Approximately 881,300 acres would be managed as ROW exclusions; 54 percent of these acres would be in VCCs that are moderately or highly departed.

Maintaining current limitations on post-fire restoration, weed treatments, seedings, and prescribed fire within and near special status species habitat, including for special status plants, may slow the pace and scale of treatments that the BLM can employ. As a result, burned habitat areas may move away from historical conditions, especially if invasive annual grasses were present in the area before the fire. In this case, invasive annual grasses would be more likely to regenerate in burned areas and outcompete native vegetation, changing the fire regime to one with more frequent fires facilitated by continuous fine fuels.

Commercial harvest would continue to be a tool used for forest health treatments across GSENM. Allowing commercial harvest may result in more acres being treated over time, as treatments would carry economic incentive. As described under *Impacts Common to All Alternatives*, where treatments were carried out, VCC and FRG would be maintained or moved toward historical conditions. When fires ignited or burned into these areas, such conditions may facilitate response efficiency. While commercial harvest would continue to be allowed in GSENM, in practice, such treatments are unlikely to be carried out in WSAs due to potential incompatibilities with wilderness values.

The number of acres of VCCs that would be in ERMA and SRMA is summarized in **Table 3-65**, Vegetation Condition Classes in Recreation Management Areas. About 1,797,700 acres would be managed in ERMA; 61 percent of these acres would encompass VCCs that are moderately to highly departed from historical conditions, increasing the potential for human-caused fire and acres burned, for the reasons described under *Impacts Common to All Alternatives*. About 67,600 acres would be managed in SRMA; 35 percent of these acres would be in VCCs that are moderately or highly departed.

### **Alternative B**

Prioritizing wildland fire to protect, maintain, and enhance resources and to function in its natural ecological role would have similar effects as described under *Impacts Common to All Alternatives*. However, under Alternative B, additional administrative guidance would be in place to identify what fires could be allowed to burn, and where such management would be appropriate (for example, where wildland fire would not harm life and property, native habitats, special status species habitats, or GSENM objects). As a result, when wildland fires are allowed to burn, they would likely result in movement toward desired conditions. This is because the BLM would identify the most appropriate areas for such management, including areas where fuels have not accumulated to hazardous levels. Like Alternative A, only natural-caused fires would be allowed to potentially burn for resource benefit.

Proactive, landscape-scale vegetation management to restore functional vegetative communities would help maintain the extent and function of vegetation communities in the longer term as climate trends become more pronounced. Vegetation management is likely to be focused in areas where the VCC is the most departed from historical conditions, for instance, in historical sagebrush communities that have been encroached on by pinyon and juniper trees, and in historical woodlands where infill by pinyon and juniper

trees has occurred. Vegetation management proposals would be informed by a number of ecological factors, like soil, hydrology, and biological soil crust conditions, helping improve the design and rationale for carrying out treatments. As a result, the VCC would likely move toward historical conditions in more areas than under Alternative A. This would occur because treatments would address the risk of uncharacteristically large, severe fire by reducing woody fuel loads. As a result, the acres burned over time would decrease relative to Alternative A, leading to less potential for invasive annual grass establishment.

Proactive vegetation management, as described above, would result in VCCs more typical of conditions prior to Euro-American contact; conditions that would experience more frequent, low-severity fire. When ignitions occur in treated areas, or fires burn into treated areas, these fires would be expected to provide fewer challenges for response. As a result, there would be a higher likelihood that such fires could be more effectively and efficiently managed, compared with Alternative A.

Rehabilitating and restoring landscapes after wildland fire would be done according to site management goals; goals would vary generally based on ecosystem function and if ecosystems are at risk of losing ecosystem components or are functioning within their historical range. Adapting rehabilitation and restoration goals based on site function would help maintain or restore the VCC and FRG in burned areas.

The effects on fire and fuels from management directions under Alternative B for other resources and resource uses are described below.

Completing land health assessments would facilitate identification of causal factors affecting vegetation and fuel loading conditions, which would in turn, facilitate vegetation and fuel reduction treatments to move VCC toward desired conditions. Carrying out assessments in nine priority watersheds before other areas would help move VCC toward desired conditions in these areas faster than other watersheds in GSENM.

Protecting and maintaining surface water availability in GSENM would have similar effects as described under Alternative A. In addition, because the BLM would also manage to prevent loss of groundwater, beneficial effects described in Alternative A would be enhanced due to continued availability of groundwater in the face of climate change, helping to maintain riparian vegetation community structure and function, and prevent build up of standing dead woody fuels in these areas. This would help maintain the VCC at desired conditions and reduce the risk of uncharacteristically large and severe fire in riparian areas, to a greater extent than under Alternative A.

Developing water sources for recreation and livestock use would have similar effects on fire and fuels as described under Alternative A. There would be additional considerations for protecting GSENM objects during livestock water developments, however, there would still be the increased potential for annual herbaceous invasive plant establishment and spread associated with these developments, and the same effects on fuel loadings and potential for human-caused ignition. Since new water developments would not be allowed in natural plant communities that lack invasives, these effects would be avoided in such areas, however, these areas are relatively limited across GSENM.

The number of acres of VCCs that would be in each type of management prescription for lands with wilderness characteristics under the alternatives is summarized in **Table 3-62**, Vegetation Condition Classes in Lands with Wilderness Characteristics. Under Alternative B, managing 72,000 acres to protect lands with wilderness characteristics (including 35,200 acres or 49 percent of which would be in VCCs



that are moderately departed from historical conditions) may reduce the number of human-caused fires and acres burned in these areas compared with Alternative A. When fires did occur, response may be more complex than under Alternative A. This prescription would apply for lands with wilderness characteristics that are wholly surrounded by WSAs.

The effects from managing lands with wilderness characteristics for multiple uses and not applying provisions specifically to protect wilderness characteristics would be as described under Alternative A. While fewer acres would fall under this allocation than under Alternative A, the same proportion of those acres (57 percent) would be in VCCs that are moderately departed from historical conditions (VCC IIA) or moderately to highly departed (VCC IIB).

The number of acres of VCCs that would be in each type of ROW allocation under the alternatives is summarized in **Table 3-63**, Vegetation Condition Classes in Rights-of-way Allocations. Approximately 85,000 acres (86 percent fewer acres than under Alternative A) would be managed as open to ROWs; 70 percent of these acres would encompass VCCs that are moderately to highly departed from historical conditions. The potential for human-caused fires to start in these areas would therefore be lower than under Alternative A. The opportunities to use ROWs as fuel breaks during fire response would also be lower.

Approximately 945,700 acres would be managed as ROW exclusion; 52 percent of these acres would be in VCCs that are moderately or highly departed from historical conditions. This is similar to the amount of ROW exclusion under Alternative A, so the potential for human-caused fires to start in these areas, and the potential for ROWs to be used as fuel breaks, also would be similar to Alternative A.

The pace and scale of post-fire restoration, weed treatments, seedings, and prescribed fire within and near special status species habitat would likely increase compared with Alternative A. This is because the current limitations on these activities would not apply; instead, treatments could be implemented as long as appropriate mitigation measures could protect special status species during treatments. As a result, fewer burned habitat areas would move away from historical conditions in terms of fuel loading and fire regime.

The number of acres of VCCs that would be in ERMA and SRMA under the alternatives is summarized in **Table 3-65**, Vegetation Condition Classes in Recreation Management Areas. Approximately 1,770,100 acres (nearly the same as under Alternative A) would be managed as ERMA; 61 percent of these acres would encompass VCCs that are moderately to highly departed from historical conditions. The potential for human-caused fires to start in these areas and the potential for acres burned would therefore be about the same as under Alternative A.

Approximately 95,300 acres (30 percent more acres than under Alternative A) would be managed as SRMA; 32 percent of these acres would encompass VCCs that are moderately to highly departed from historical conditions. The potential for human-caused fires to start in these areas and the potential for acres burned would therefore be greater than under Alternative A.

### **Alternative C**

The effects on fire and fuels from management direction specific to fire and fuels management contained under Alternative C would be as described under Alternative B.

The effects on fire and fuels from management directions under Alternative C for other resources and resource uses are described below.

Designating and managing the four types of management areas (front country, passage, outback, and primitive) would not directly affect fire and fuels on GSENM. However, managing these areas under Alternative C would affect other allocations (e.g., ROW allocations, RMAs, and others) that could, in turn, indirectly affect the condition of fire and fuels and the potential for fire ignitions. These are discussed in the analyses below for Alternative C.

Ensuring that smoke generated during prescribed burning conforms with the Utah Smoke Management Plan and are timed for maximum smoke dispersal, would limit the time and duration that prescribed burning would be allowable. This may reduce the opportunities for using prescribed burning as a tool for proactive vegetation management and woody fuel load reduction. As a result, the VCC would likely move toward historical conditions more slowly, and the risk of uncharacteristically large and severe fires would be greater than under Alternative A which does not include these restrictions on prescribed burning. There are no other air quality management directions that would affect fire and fuels management.

The effects from completing land health assessments in nine priority watersheds would be the same as described under Alternative B.

Developing water sources for recreation and livestock use would have similar effects on fire and fuels as described under Alternative A. There would be additional considerations for protecting GSENM objects during water developments depending on the management area they were developed in, however, there would still be the increased potential for annual herbaceous invasive plant establishment and spread associated with these developments, and the same effects on fuel loadings and potential for human-caused ignition. Since new water developments would not be allowed in natural plant communities that lack invasives, these effects would be avoided in such areas, however, these areas are relatively limited across GSENM.

The number of acres of VCCs that would be in each type of management prescription for lands with wilderness characteristics under the alternatives is summarized in **Table 3-62**, Vegetation Condition Classes in Lands with Wilderness Characteristics. Managing 312,800 acres to minimize impacts on lands with wilderness characteristics while emphasizing other multiple uses would likely have similar effects to those described under Alternative A. This is because other multiple uses would still be emphasized in these areas and, as a result, recreation trends and increased potential for human-caused fire ignitions would still occur in these areas. Approximately 54 percent of acres in this allocation would be in VCCs that are moderately departed from historical conditions (VCC IIA) or moderately to highly departed (VCC IIB).

The number of acres of VCCs that would be in each type of ROW allocation under the alternatives is summarized in **Table 3-63**, Vegetation Condition Classes in Rights-of-way Allocations. Approximately 10,900 acres (98 percent less than under Alternative A) would be managed as open to ROWs; 55 percent of these acres would encompass VCCs that are moderately to highly departed from historical conditions. The potential for human-caused fires to start in these areas would therefore be lower than under Alternative A, as would the potential that ROWs could serve as fuel breaks during fire response.

Approximately 1,163,500 acres (3 percent more than under Alternative A) would be managed as ROW exclusion; 56 percent of these acres would be in VCCs that are moderately or highly departed from historical conditions. The potential for human-caused fires to start in these areas would be lower than under Alternative A, as would the potential that ROWs in these areas could serve as fuel breaks during fire response.

The number of acres of VCCs that would be in ERMA and SRMA under the alternatives is summarized in **Table 3-65**, Vegetation Condition Classes in Recreation Management Areas. Approximately 486,300 acres (73 percent fewer acres than under Alternative A) would be managed as ERMA; 65 percent of these acres would encompass VCCs that are moderately to highly departed from historical conditions. The potential for human-caused fires to start in these areas and the potential for acres burned would therefore be less than under Alternative A.

Approximately 417,400 acres (6 times more acres than under Alternative A) would be managed as SRMA; 42 percent of these acres would encompass VCCs that are moderately to highly departed from historical conditions. The potential for human-caused fires to start in these areas and the potential for acres burned would therefore be greater than under Alternative A.

Managing recreational areas under Alternative C may similarly concentrate recreational use, including motorized use and overnight camping, into areas that provide facilities catering to these uses. This may also concentrate the potential for human-caused ignitions and acres burned in resulting fires in these areas. This would likely primarily include the front and passage areas, which would provide the greatest number of developed facilities. Potential effects in the outback area would be limited to designated roads and routes. The potential for these effects would be lowest in the primitive area, as motorized use and developed facilities would not be present.

The effects from fish and wildlife and special status species management would be the same as those described under Alternative B.

#### **Alternative D**

Prioritizing wildland fire to protect, maintain, and enhance resources and to function in its natural ecological role where such management would be appropriate (for example, where wildland fire would not harm life and property, native habitats, special status species habitats, or GSENM objects) would have the same effects as described under Alternative B.

Landscape-scale ecosystem restoration projects would be done to restore native functional vegetation communities would be carried out as described above, but management would prioritize natural processes and techniques over other methods. This means that management methods such as chaining and mechanical removal would be deemphasized in favor of prescribed fire and biological management methods. As a result, it is likely that fewer acres of management would be done. This is because there are uncharacteristic fuel loadings in many areas of GSENM, and prescribed fire would not be appropriate in these areas without mechanical pretreatments to remove fuels. Similarly, biological management methods may weaken, defoliate, or otherwise kill target vegetation, but would leave residual woody or fine fuels on the landscape, resulting in managed areas that would also not be appropriate for prescribed fire application. Carrying out fewer acres of management would mean more areas would remain at increased

risk for uncharacteristically large, severe fire, and more areas would remain in a VCC that is departed from historical conditions.

The effects on fire and fuels management from carrying out emergency stabilization and restoration would be similar to the effects described under in the *Impacts Common to All Alternatives* section. However, since Alternative D would prioritize natural processes and techniques, fewer acres of treatments would likely be done. The reasoning for this is explained above. In summary, natural processes and techniques are not appropriate for use in some areas of GSENM due to uncharacteristically high fuel loads. Carrying out fewer acres of treatments would mean more areas would remain at increased risk for uncharacteristically large, severe fire, and more areas would remain in a VCC that is departed from historical conditions. Further, in burned areas there would likely be more acres that move toward a FRG favoring higher frequency fire as invasive annual grasses become dominant in these areas.

The effects on fire and fuels from management directions under Alternative D for other resources and resource uses are described below.

Effects from air quality management would be the same as described under Alternative C.

The effects from completing land health assessments would be similar to those described under Alternative B. However, because assessments would not be done in priority watersheds, VCC would likely move toward desired conditions in other watersheds in GSENM where actions to rectify issues are carried out.

Developing water sources for recreation and livestock use—even when the primary purpose is for the benefit of GSENM objects—would have similar effects on fire and fuels as described under Alternative A, because there would still be the increased potential for annual herbaceous invasive plant establishment and spread associated with these developments, and the same effects on fuel loadings and potential for human-caused ignition. Since new water developments would not be allowed in natural plant communities that lack invasives, these effects would be avoided in such areas, however, these areas are relatively limited across GSENM.

The number of acres of VCCs that would be in each type of management prescription for lands with wilderness characteristics under all alternatives is summarized in **Table 3-62**, Vegetation Condition Classes in Lands with Wilderness Characteristics. Managing all (559,600 acres) lands with wilderness characteristics to protect wilderness character would reduce the potential for human-caused fire ignitions and acres burned in these areas compared with Alternative A. However, as discussed above, fire response would be more complex and potentially less efficient.

Monitoring for and controlling invasive plant species and noxious weeds would have similar effects on fuel loading and VCC as described under *Impacts Common to All Alternatives*. However, giving priority to natural processes for weed control may reduce management effectiveness or slow movement toward desired conditions. As a result, fuel loading reductions and movement of the VCC toward desired conditions may not be as pronounced as under other alternatives that would allow a full suite of management methods.

The number of acres of VCCs that would be in each type of ROW allocation under the alternatives is summarized in **Table 3-63**, Vegetation Condition Classes in Rights-of-way Allocations. Approximately 2,300 acres (a fraction of a percent of the acres under Alternative A) would be managed as open to

ROWs; 34 percent of these acres would encompass VCCs that are moderately to highly departed from historical conditions. The potential for human-caused fires to start in these areas would therefore be lower than under Alternative A, as would the potential for ROWs in these areas to serve as fuel breaks during fire response.

Approximately 1,608,800 acres (48 percent more than under Alternative A) would be managed as ROW exclusion; 59 percent of these acres would be in VCCs that are moderately or highly departed from historical conditions. The potential for human-caused fires to start in these areas would be lower than under Alternative A, as would the potential for ROWs in these areas to serve as fuel breaks during fire response.

The number of acres of VCCs that would be in ERMA and SRMA under the alternatives is summarized in **Table 3-65**, Vegetation Condition Classes in Recreation Management Areas. Approximately 311,900 acres (83 percent fewer acres than under Alternative A) would be managed as ERMA; 45 percent of these acres would encompass VCCs that are moderately to highly departed from historical conditions. The potential for human-caused fires to start in these areas and the potential for acres burned would therefore be lower than under Alternative A.

Approximately 100,300 acres (1.5 times more acres than under Alternative A) would be managed as SRMA; 33 percent of these acres would encompass VCCs that are moderately to highly departed from historical conditions. The potential for human-caused fires to start in these areas and the potential for acres burned would therefore be greater than under Alternative A.

### **Alternative E**

Because the goals, objectives, and management directions for fire management under Alternative E would be nearly identical to Alternative C, the effects on fire and fuels would generally be as described for that alternative. The primary difference between the alternatives would be that the BLM would allow, rather than prioritize, certain wildfire fires to burn for the benefit of other resources. Because using wildland fire would not be a priority over other resources, it is likely that fewer naturally ignited fires would be allowed to burn for the benefit of other resources relative to Alternative B. However, when wildland fires are allowed to burn, they would likely result in more effective movement toward desired conditions than under Alternative A, which lacks such management direction. As a result, the VCC would likely move toward historical conditions in more areas than under Alternative A.

The effects on fire and fuels from management directions under Alternative E for other resources and resource uses are described below.

As discussed for Alternative C, designating and managing the four types of management areas (front country, passage, outback, and primitive) could indirectly affect the condition of fire and fuels and the potential for fire ignitions primarily through other allocations in these areas. These are discussed in the analyses below for Alternative E.

Effects from air quality management would be the same as described under Alternative C.

The effects from completing land health assessments in nine priority watersheds would be the same as described under Alternative B.

Developing water sources for recreation and livestock use—regardless of the Management Area and even when the primary purpose is for the benefit of GSENM objects—would have similar effects on fire and fuels as described under Alternative A, because there would still be the increased potential for annual herbaceous invasive plant establishment and spread associated with these developments, and the same effects on fuel loadings and potential for human-caused ignition. Since new water developments would not be allowed in natural plant communities that lack invasives, these effects would be avoided in such areas, however, these areas are relatively limited across GSENM.

The number of acres of VCCs that would be in each type of management prescription for lands with wilderness characteristics under the alternatives is summarized in **Table 3-62**, Vegetation Condition Classes in Lands with Wilderness Characteristics. Allocations under Alternative E would be the same as under Alternative C. Effects would be as described for that alternative.

The number of acres of VCCs that would be in ERMA and SRMA under the alternatives is summarized in **Table 3-65**, Vegetation Condition Classes in Recreation Management Areas. Allocations under Alternative E would be the same as under Alternative C, as would the effects from these allocations on fire and fuels.

The number of acres of VCCs that would be in each type of ROW allocation under the alternatives is summarized in **Table 3-63**, Vegetation Condition Classes in Rights-of-way Allocations. Approximately 10,900 acres (98 percent less than under Alternative A) would be managed as open to ROWs; 55 percent of these acres would encompass VCCs that are moderately to highly departed from historical conditions. The potential for human-caused fires to start in these areas would therefore be lower than under Alternative A, as would the potential that ROWs could serve as fuel breaks during fire response.

Approximately 1,251,800 acres (2 percent more than under Alternative A) would be managed as ROW exclusion; 53 percent of these acres would be in VCCs that are moderately or highly departed from historical conditions. The potential for human-caused fires to start in these areas would be lower than under Alternative A, as would the potential that ROWs in these areas could serve as fuel breaks during fire response.

### **Cumulative Impacts**

The BLM, Forest Service, NPS, and adjacent state, tribal, county, and privately owned lands surrounding GSENM are considered to be the cumulative effects analysis area for fire and fuels management. Ongoing and planned actions in and near GSENM would influence fire and fuels management effectiveness on a regional scale. The time frame for cumulative environmental consequences for future actions is 15 years.

Portions of GSENM adjoin other BLM-managed lands, National Forest System lands, national parks, and national recreation areas, each having its own land management plan guiding vegetation and fuels management in the administrative area. Fire and fuels management is becoming more broadly consistent across federal land ownerships due to updated plan adherence with current federal law, regulation, and policy. Fire and fuels direction in the adjacent agency land management plans are complementary to the proposed plan components for GSENM. This means broad movement toward desired conditions for vegetation condition, fuel loading, and fire response would be facilitated across administrative boundaries in this region.

The cumulative impacts of past and present actions on fire and fuels management in the planning area are captured in the description of the affected environment (**Section 3.13.1**). Primarily this includes pre-Euro-American contact frequent, lower-intensity fire, followed by post-Euro-American contact livestock grazing and fire suppression. This includes policies established in the early 1900s and carried forward in other forest and land management plans and other state and local policies throughout the broader landscape, which have resulted in current hazardous fuel loading and VCC and fire regimes that are departed from historical conditions. This has resulted in a landscape with more flammable woody and fine vegetation and a greater potential for uncharacteristically large, severe fires compared with historical conditions. Ongoing climate trends, including more frequent extreme fire weather, combine with and exacerbate these conditions.

The importance of fuels treatments and wildland fire management is widely recognized by state and federal agencies, adjacent landowners, and the general public. Actions taken outside GSENM include federal and state-funded hazardous fuel reduction projects on National Forest System and BLM-managed lands that generally aim to move vegetation conditions and fuel loading toward historical conditions and restore historical FRGs. Continuation of management prescribed in the BLM's KEPA 2020 ROD would allow for activities that increase the risk of wildfires (such as recreation) and vegetation management projects that would reduce fuel loading. The KFO Noxious and Invasive Vegetation Management Environmental Assessment would continue to guide weed management on lands bordering GSENM and would, therefore, have the potential to reduce weeds encroaching onto GSENM. Other vegetation management projects in the cumulative effects analysis area include the Upper Kanab Creek Watershed Environmental Assessment. There are also additional renewable energy and other ROW projects in the cumulative effects analysis area, including industrial-scale solar energy development on [Utah Trust Lands Administration \(formerly State of Utah School and Institutional Trust Lands Administration\)](#) lands near Big Water. Other relevant activities include recreational activities such as camping/campfire use, OHV use, and continued livestock grazing that could affect the extent of fine fuels such as invasive annual grasses.

Also, nonfederal land management policies are likely to continue affecting fire and fuels management around GSENM. The cumulative effects across the large, geographically complex, and diverse cumulative analysis area are difficult to analyze, considering the uncertainties associated with government and private actions and ongoing changes to the region's economy. However, based on the trends identified in this section, cumulative effects, including increases in recreation, continued establishment and spread of weeds, continued encroachment of pinyon and juniper into sagebrush communities, ongoing livestock grazing, and expansion of the wildland-urban interface, including housing and commercial development, are likely to continue or increase.

Reasonably foreseeable future actions in GSENM have the potential to impact fire and fuels management; these are generally projects that would substantially alter fuel loading or VCC or projects for which there is a risk of human-caused fire. Projects that are anticipated to alter fuel loading include the Skutumpah Terrace Greater Sage-grouse Habitat Restoration Projects. Projects that may increase the potential for human-caused fire ignitions are ROW development projects including the [Garkane ROWs \(Cottonwood/Cockscomb; Buckskin to Kanab, Utah and Fredonia; Buckskin to Page\)](#), the [Arcadin ROW](#), the [Navajo-McCullough Powerline ROW](#), and the Lake Powell Pipeline ROW. These projects, which also involve surface disturbance, may facilitate invasive plant establishment and spread, increasing fuel loading along the ROW corridor.

Proposed wildland fire management activities under Alternatives B, C, D, and E would contribute to the cumulative effects of regional fire and fuels management by other agencies and stakeholders. These efforts would contribute to landscape restoration and ecological resilience on a larger scale, with a focus on achieving desired vegetation conditions, restoring more natural FRGs, and reducing the potential for uncharacteristically large and severe fires. Alternatives B, C, and E, which prioritize active management with a full range of treatment options, could have greater contributions toward these effects than Alternative D, which emphasizes passive management and more limited treatment options.

### **3.14 LANDS WITH WILDERNESS CHARACTERISTICS**

Congress has given the BLM broad authority to identify lands with wilderness characteristics and, if appropriate, to manage lands to protect such characteristics. Lands with wilderness character are considered based on factors identified in BLM Manual 6320 (BLM Manual 2021b). Factors include manageability, resource values and uses, and congressional release of WSAs. Under FLPMA Section 201 and later per guidance outlined in BLM Manual 6310 (BLM 2021a), the BLM began updating findings for lands with wilderness characteristics in 1996 and completed findings in early 1999 (BLM 1999). This inventory was updated in 2020 and 2023 to further identify which GSENM lands contain wilderness characteristics.

#### **3.14.1 Affected Environment**

##### ***Current Conditions***

Procedures for inventorying lands with wilderness characteristics are provided in BLM Manual 6310 (BLM 2021a). The inventory process includes maintaining existing wilderness inventory units and identifying new ones; keeping a current inventory of roads that meet the wilderness inventory road definition, assessing wilderness characteristics; and determining if an area meets the overall criteria for having wilderness characteristics.

There are 559,600 acres outside of existing WSAs that the BLM has determined through inventory to possess wilderness characteristics (see **Table I-20, Appendix I** and **Figure 2-8, Appendix A**). The detail provided in **Appendix I, Section I.14**, lists the specific areas and acreages inventoried for wilderness characteristics, and the trends and forecasts of current and future conditions of wilderness characteristics in GSENM.

#### **3.14.2 Environmental Consequences**

Refer to **Section F.19, Lands with Wilderness Characteristics**, in **Appendix F, Analytical Framework**, for descriptions of the indicators, analysis areas, and assumptions used for the following analysis.

##### ***Issue***

- How would proposed management affect the size; apparent naturalness; outstanding opportunities for solitude or primitive, unconfined recreation; and supplemental values of lands with wilderness characteristics?

##### ***Impacts Common to All Alternatives***

All lands with wilderness characteristics would continue being managed in accordance with BLM Manual 6320 to protect wilderness characteristics while providing for compatible uses, minimize impacts on



wilderness characteristics via management restrictions, or allow for other compatible uses in an area while not protecting wilderness characteristics (BLM 2021b).

Under all alternatives, adjustments made to administer livestock grazing could impact lands with wilderness characteristics. Livestock management including infrastructure, as well as direct impacts from livestock, can restrict unconfined recreation and/or decrease apparent naturalness.

#### **Alternative A**

Within the decision area, there are 559,600 acres of lands with wilderness characteristics that would continue to be managed to allow for other uses, providing minimal protection to wilderness characteristics.

Of the 559,600 acres of lands with wilderness characteristics, 344,800 acres (62 percent) would continue to be managed as open to ROW authorization, 214,400 acres (38 percent) would continue to be managed as a ROW avoidance areas, and 400 acres (less than 1 percent) would continue to be managed as a ROW exclusion areas. Land use authorization may lead to surface disturbance and a loss of apparent naturalness, outstanding opportunities for solitude or primitive and unconfined types of recreation, and supplemental values, where present. Further, linear features have the potential to act as boundaries for lands with wilderness characteristics units. If a linear feature were to bisect a unit, depending on its current size, it could reduce the area so that it no longer meets the size criteria. Developed ROWs are listed in the BLM Manual 6310 as a boundary for lands with wilderness characteristics units (BLM 2021a). Authorizing ROWs could impact lands with wilderness characteristics by reducing the acreage of a lands with wilderness characteristics unit. With the development of ROWs, like transmission lines, there is an impact on the surface of the land to create these features. This could contribute to a loss of apparent naturalness of the lands with wilderness characteristics.

The 559,600 acres of lands with wilderness characteristics would continue to be limited to designated routes for OHV use. Limiting visitors to designated routes would allow for more outstanding opportunities for solitude or primitive and unconfined recreation and decrease new disturbances that they may cause.

Under this alternative, lands with wilderness characteristics would continue to be managed as follows: VRM Class I (300 acres; less than 1 percent), VRM Class II (227,000 acres; 41 percent), VRM Class III (203,200 acres; 36 percent), and VRM Class IV (128,800 acres; 23 percent). VRM Class III and VRM Class IV objectives could impact lands with wilderness characteristics because these objectives allow for moderate and high levels of change to the landscape and allow for management activities to attract attention. Lands with wilderness characteristics are less likely to be impacted in VRM Class I and VRM Class II areas where the level of change permitted to the characteristic of the landscape is only permitted for natural ecological changes, or if the change is low.

Under this alternative, a full range of vegetation management methods would continue to be permitted. Vegetation management may provide short-term impacts on lands with wilderness characteristics depending on the treatment type. For example, chaining or mastication could cause a temporary reduction in solitude, with increased presence and noise. Mechanical vegetation removal also temporarily impacts apparent naturalness by creating abnormal concentrations of dead vegetation and fuel loading. Vegetation

management and restoration over time would improve vegetation structure, function, and condition, thereby protecting or enhancing the wilderness values, particularly apparent naturalness.

**Alternative B**

Of the 559,600 acres of lands with wilderness characteristics, 72,000 acres would be managed to protect those characteristics while also providing for compatible uses under this alternative. The remaining 487,600 acres of lands with wilderness characteristics would be managed for other compatible uses while not protecting wilderness characteristics. Depending on management, activities in the areas managed for other compatible uses may degrade the values and qualities of wilderness characteristics. Compared with Alternative A, there would be 72,000 more acres of protected lands with wilderness characteristics. This would preserve more areas with natural conditions, outstanding opportunities for solitude or primitive and unconfined recreation, and supplemental values.

Under Alternative B, the 72,000 acres managed to protect the lands with wilderness characteristics would be managed as a ROW exclusion area, thereby restricting all ROW development on these lands. Of the remaining lands with wilderness characteristics managed for other compatible uses, 11,800 acres would be open to ROW authorization, 462,600 acres would be managed as a ROW avoidance area, and 13,300 acres would be managed as a ROW exclusion area, but without additional protections for the lands with wilderness characteristics. Compared with Alternative A, lands with wilderness characteristics would be more protected from ROW disturbances under this alternative because majority of the lands with wilderness characteristics would be managed as a ROW exclusion or avoidance area. As a result, this would protect more lands with wilderness characteristics from the development of ROWs that could impact the size of the lands with wilderness characteristics units. This would also protect the lands with wilderness characteristics from surface disturbances that could impact the apparent naturalness, opportunities for primitive and unconfined recreation, and supplemental values.

Under Alternative B, the 72,000 acres of protected lands with wilderness characteristics would be closed to OHV use, thereby preventing potential damage from this use. The remaining lands with wilderness characteristics that would be managed for other compatible uses would have 300 acres closed to OHV use, but the majority of the lands (487,400 acres) would be limited to designated routes. Compared with Alternative A, lands with wilderness characteristics would be more protected from OHV use under this alternative because more acres would be closed to OHV use. This would increase the outstanding opportunities for solitude by restricting the sight and sound of vehicle use and other people. A decrease in motorized access on some lands with wilderness characteristics units could reduce opportunities for primitive nonmotorized recreation in adjacent areas by making remote trailheads less accessible during the hot and dry seasons. Reduced OHV use improves apparent naturalness by preventing user-created route proliferation, route widening or braiding, and dispersed camping impacts.

Under Alternative B, the 72,000-acres managed to protect lands with wilderness characteristics would be managed as a VRM Class I. The remaining lands with wilderness characteristics that would be managed for other compatible uses would be as follows: 2,000 acres managed as VRM Class I, 281,500 acres managed as VRM Class II, and 204,200 acres managed as VRM Class III. Compared with Alternative A, lands with wilderness characteristics would be more protected by VRM under this alternative because more acres would be managed as a VRM Class I and a VRM Class II. As a result, these areas would preserve or retain the existing character of the landscape.

Vegetation management under Alternative B would be similar to Alternative A, except on the 72,000 acres of lands with wilderness characteristics that are managed to protect those characteristics. Vegetation management and restorations would only be permitted on these acres if they enhance or preserve wilderness characteristics.

### **Alternative C**

Of the 559,600 acres of lands with wilderness characteristics, 240,600 acres would be managed to protect wilderness characteristics while also providing for compatible uses under this alternative. There would also be 312,800 acres of lands with wilderness characteristics managed to minimize impacts on those characteristics while allowing compatible uses that are consistent with protection of GSENM objects. The remaining 6,100 acres of lands with wilderness characteristics would be managed for other compatible uses, and therefore providing minimal protection to wilderness characteristics. Compared with Alternative A, an additional 240,600 acres of lands with wilderness characteristics would be protected.

Under Alternative C, the 240,600 acres managed to protect lands with wilderness characteristics would be managed as a ROW exclusion area. Additionally, of the 312,800 acres managed to minimize impacts on lands with wilderness characteristics, 11,500 acres would be managed as a ROW exclusion area and 301,300 acres would be managed as a ROW avoidance area. Of the remaining 6,100 acres of lands with wilderness characteristics that would be managed for other compatible uses, all acres would be managed as a ROW avoidance. Compared with Alternative A, lands with wilderness characteristics would be more protected from ROW disturbances under this alternative because all the lands with wilderness characteristics would be managed as a ROW exclusion or avoidance area. As a result, this would protect more lands with wilderness characteristics from the development of ROWs that could impact the size of the lands with wilderness characteristics units. This would also protect the lands with wilderness characteristics from surface disturbances that could impact the apparent naturalness, opportunities for primitive and unconfined recreation, and supplemental values.

Under Alternative C, the 240,600 acres managed to protect lands with wilderness characteristics would be closed to OHV use. Of the 312,800 acres managed to minimize impacts on lands with wilderness characteristics, 52,500 acres would be closed to OHV use and 260,300 acres would be limited to designated routes. There would be no acres closed to OHV use and 6,100 acres limited to designated routes in areas that are managed for compatible use while not protecting lands with wilderness characteristics. Compared with Alternative A, lands with wilderness characteristics would be more protected from OHV use under this alternative because more acres would be closed to OHV use. This would increase the outstanding opportunities for solitude by restricting sight and sounds of vehicle use and other people. A decrease in motorized access in some lands with wilderness characteristics units could reduce opportunities for primitive nonmotorized recreation in adjacent areas by making remote trailheads less accessible during the hot and dry seasons. The decrease in motorized and mechanized access would also increase the opportunities for primitive recreation in lands with wilderness characteristic units and reduce impacts on apparent naturalness.

Under Alternative C, the 240,700 acres managed to protect lands with wilderness characteristics would be managed as VRM Class I. There would also be 15,600 acres of VRM Class I, 308,100 acres managed as VRM Class II, and 4,000 acres managed as VRM Class III on lands that are managed to minimize impacts on wilderness characteristics. There would be no acres managed as VRM Class I, 5,700 acres managed as VRM Class II, and 400 acres managed as VRM Class III on lands that are managed for compatible uses

while not protecting wilderness characteristics. Compared with Alternative A, lands with wilderness characteristics would be more protected by VRM under this alternative because more acres would be managed as a VRM Class I and a VRM Class II. As a result, these areas would preserve or retain the existing character of the landscape.

The types of impacts from vegetation management and restorations on lands with wilderness characteristics under Alternative C would be the same as those described under Alternative B.

#### **Alternative D**

Of the 559,600 acres of lands with wilderness characteristics, 559,600 acres would be managed to protect wilderness characteristics while providing for compatible uses under this alternative. In comparison with Alternative A, which would continue to allow for other compatible uses and not outline any specific management restrictions in these areas, this alternative would protect wilderness characteristics while providing for compatible uses for all lands within GSENM that have been identified through the inventory process to protect wilderness characteristics.

Under Alternative D, there would be 559,600 acres that would be managed as a ROW exclusion area for lands that are managed to protect wilderness characteristics. Compared with Alternative A, lands with wilderness characteristics would be more protected from ROW disturbances under this alternative because all the lands with wilderness characteristics would be managed as a ROW exclusion area. As a result, this would protect more lands with wilderness characteristics from the development of ROWs that could impact the size of the lands with wilderness characteristics units. This would also protect the lands with wilderness characteristics from surface disturbances that could impact the apparent naturalness, opportunities for primitive and unconfined recreation, and supplemental values.

Compared with Alternative A, lands with wilderness characteristics would be more protected from OHV use under this alternative because no acres would be open to OHV use. This would increase the [outstanding](#) opportunities for solitude by restricting sight and sounds of vehicle use and other people. A decrease in motorized access in some lands with wilderness characteristics units could reduce opportunities for primitive nonmotorized recreation in adjacent areas by making remote trailheads less accessible during the hot and dry seasons. Reduced OHV use improves apparent naturalness by preventing user-created route proliferation, route widening or braiding, and dispersed camping impacts.

Under Alternative D, the 559,600 acres of protected lands with wilderness characteristics would be managed as a VRM Class I. Compared with Alternative A, lands with wilderness characteristics would be more protected by VRM under this alternative because all the lands with wilderness characteristics would be managed as a VRM Class I. As a result, these areas would preserve the existing character of the landscape.

The types of impacts from vegetation management and restorations on lands with wilderness characteristics under Alternative D would be the same as those described under Alternative B.

#### **Alternative E**

[Of the 559,600 acres of lands with wilderness characteristics, 329,400 acres would be managed to protect wilderness characteristics while also providing for compatible uses under this alternative. There would also be 224,100 acres of lands with wilderness characteristics managed to minimize impacts on those](#)

characteristics while allowing compatible uses that are consistent with protection of GSENM objects . The remaining 6,100 acres of lands with wilderness characteristics would be managed for other compatible uses, and therefore providing minimal protection to wilderness characteristics. Compared with Alternative A, an additional 329,400 acres of lands with wilderness characteristics would be protected.

Impacts on lands with wilderness characteristics under Alternative E would be similar to those described under Alternative C due to similar management direction being applied under both of these alternatives. Differences in allocations for lands with wilderness characteristics management strategies for Alternative E include 88,800 more acres managed to protect wilderness characteristics than under Alternative C. These areas would be managed to minimize impacts under Alternative C, resulting in a larger area with protection from impacts to lands with wilderness characteristics under Alternative E.

### **Cumulative Impacts**

Past and present land management activities and natural disturbance processes on lands with wilderness characteristics have included livestock grazing management and range improvements, vegetation management, fuels management, and noxious weeds control. These activities include the Rangeland Wells and Pipelines and the KFO Noxious and Invasive Vegetation Management. These types of actions are anticipated to continue in the relatively foreseeable future and could impact the lands with wilderness characteristics. The KFO Noxious and Invasive Vegetation Management project has the potential to reduce the possibility of invasive vegetation along the boundary of GSENM and KFO lands.

Resource uses also include recreational use. Recreational use is expected to increase throughout GSENM and will alter the landscape over time through increased human presence, drone use, OHV use, dispersed camping, and hiking in certain areas. This can lead to increased disturbances, such as crowding, noise, route widening, and campsite expansion. These alterations could increase surface disturbance and degrade the apparent naturalness of the area.

Existing and foreseeable developments and managements are likely to impact lands with wilderness characteristics under Alternative A because they are not currently protected. Alternative B, C, D, and E would have fewer impacts because wilderness characteristics would be managed to protect and minimize impacts. There could still be impacts from these activities seen in Alternatives B, C, and E in the areas that would be managed for other compatible uses while not protecting lands with wilderness characteristics.

## **3.15 FORESTRY AND WOODLAND PRODUCTS**

### **3.15.1 Affected Environment**

#### **Current Conditions**

Woodland resources in the decision area consist primarily of pinyon and juniper communities, with small, scattered patches of ponderosa pine forests, Douglas-fir forests, and aspen groves. Aspen is valuable because it contributes significantly to the species diversity of forest landscapes (Kivinen 2020). There has been a long-term reduction in the area of aspen forests in parts of Utah, and some aspen stands are not recovering or regenerating from disturbance the way they have in the past (Forest Service n.d.). The primary woodland product in the decision area is fuelwood harvesting. Cedar posts and Christmas trees are also harvested in smaller quantities. Additional detail about the affect environment for forestry and woodlands can be found in **Appendix I, Section I.15**. There are 858,300 acres of woodlands within the decision area.

### 3.15.2 Environmental Consequences

Refer to **Section F.20**, Forestry and Woodland Products, in **Appendix F**, Analytical Framework, for descriptions of the indicators, analysis areas, and assumptions used for the following analysis.

#### **Issue**

- How would vegetation management decisions affect woodland and forestry product harvest in the planning area?

#### **Impacts Common to All Alternatives**

The goals, objectives, and management actions common to all alternatives for woodlands and forests would help maintain forests in the long term by balancing forest health with forest uses. The management actions would provide direction for woodland product harvest throughout the life of the plan. Under all alternatives, the goal for forestry and woodland products is to promote, sustain, and improve forest health.

The planning area is expected to experience an increase in extreme temperatures and weather, a decrease in water availability, and an increase in fire risk as climate trends continue and become more pronounced. Regardless of the alternative, the effects of climate change would likely combine with and exacerbate some of the effects that result from implementing the alternatives. This, in turn, would affect forestry and woodland products. Increased extreme temperatures, weather events, fire frequency, and fire size could increase the amount of type conversion to communities dominated by invasive annual grasses. This would lower the ecological resilience to future disturbance and thereby alter forestry and woodland product availability.

Since the effects on forestry and woodland products from weather and changing climate would not vary substantially across alternatives, climate change impacts are not discussed further.

Continuing to monitor for and control invasive plant species and noxious weeds using an integrated weed management program would slow the establishment and spread of weeds in the planning area. Where these treatments are carried out, it would help to promote, sustain, and improve forest health.

Warming temperatures, drought, and other extreme weather could lead to an increased fire risk. Effects are expected to increase in frequency and will likely contribute to impacts on forestry and woodland products. The Colorado Plateau Rapid Ecological Assessment suggests the ecoregion is expected to undergo general warming, with as much as a 3.6°F (2°C) increase by 2060 in some locations, particularly in the southern portion of the ecoregion (Bryce et al. 2012, p. 130). Since the effects on forestry and woodland products from fire would not vary substantially across alternatives, fire management is not discussed further.

#### **Alternative A**

Under Alternative A, the objective to improve forest and woodland health to protect plant populations, watershed values, and support wildlife habitat requirements would continue. Alternative A would continue to prohibit the removal of ponderosa pine for Christmas trees. Alternative A would continue to allow commercial timber harvesting for the purposes of promoting or sustaining forest health across the entirety of GSENM. Approximately 984,500 acres would remain open to commercial and noncommercial harvest. The WSA acreage would remain closed to commercial and noncommercial woodland products. The management direction for commercial and noncommercial fuelwood harvesting under Alternative A

would allow for noncommercial fuelwood harvesting, post cutting, and Christmas tree cutting, except in WSAs and areas posted or signed as closed to meet forestry goals and objectives otherwise designated or subject to a stipulation. The BLM would continue to manage areas with ponderosa pine and aspen to maintain and improve the stand health.

Management direction for Alternative A would allow for permit harvesting of woodland products in riparian areas for the maintenance or improvement of riparian ecosystems. Management direction for Alternative A also would allow for the sale of forest treatment residues as secondary wood products or biomass.

Landscape-scale restoration projects would not be implemented under this alternative, but individual woodland product removal and rangeland restoration projects would likely still occur. Continuing to protect, enhance, and restore vegetation communities in accordance with the ecological site potential would help maintain the vegetation community ecological processes and functions where treatments are implemented. Where treatments are carried out, forest and woodland health could be improved. However, as climate and fire trends become more pronounced, it is likely the resilience of treated vegetation communities would decrease unless specific consideration is given to increasing climate resiliency. Climate and fire trends could impact forest and woodland health negatively by the spread of noxious and invasive species and increased fire potential.

Recreation could impact forestry and woodlands by spreading noxious and invasive weeds, increasing the risk of wildfire, and causing ground disturbances, especially OHV use. Outside of WSAs, where commercial and noncommercial timber harvest is prohibited, OHV use is limited to designated routes and Alternative A would allow motorized travel on the most miles of routes. Therefore, Alternative A has the greatest potential to spread noxious and invasive weeds and increase the risk of wildfire, which would impact the availability of timber for harvest.

### **Alternative B**

Under Alternative B, the objective is to maintain and restore forest and woodland health to protect watershed values, support wildlife habitat requirements, and reduce the potential for catastrophic wildfires.

Management direction for Alternative B would prohibit the commercial harvest of forest and woodland products but would allow for the noncommercial harvest of forestry and woodland products over approximately 906,300 acres, if the harvest would maintain watershed values, support wildlife habitat requirements, and reduce the potential for catastrophic wildfires. However, Alternative B would prohibit noncommercial harvest of forestry and woodland products in the following areas:

- WSAs
- Lands with wilderness characteristics managed for protection
- Ponderosa pine, Douglas-fir, mixed conifer, and aspen stands
- Areas undergoing restoration
- 330 feet from riparian areas

The primary difference between Alternative B and Alternative A is that Alternative B would prohibit the commercial harvest of forestry and woodland products in all areas and would prohibit the noncommercial

harvest of forestry and woodland products in certain areas (such as lands with wilderness characteristics managed for protection); Alternative A would not prohibit noncommercial harvest in these areas.

Alternative B would be more restrictive compared with Alternative A. This is because Alternative B would prohibit the commercial harvest of forestry and woodland products, whereas Alternative A would allow commercial harvesting except for the removal of ponderosa pine for Christmas trees. This could mean that companies currently doing commercial harvest in GSENM would no longer be able to do so.

Likewise, fewer opportunities for woodland product harvest would occur when more areas are closed to harvest under Alternative B. This could result in the public and tribes being unable to collect products in certain locations due to harvest restrictions.

Proactive vegetation management to increase vegetation community climate resiliency would help maintain the extent and function of vegetation communities in the longer term, as climate trends become more pronounced. Treatments would likely be focused in areas where noxious and invasive weeds are the most prevalent or where pinyon and juniper trees have encroached on historical sagebrush communities. As a result, forestry and woodland health would have more improvement compared with under Alternative A.

Recreation could impact forestry and woodlands by spreading noxious and invasive weeds, increasing the risk of wildfire, and causing ground disturbances, especially OHV use. Under Alternative B, the BLM would not open any acres to authorized OHV use. OHV use would be limited to designated routes on 913,600 acres, and 952,000 acres would be closed to OHV use. Compared with Alternative A, Alternative B would have fewer acres open to OHV use, thereby reducing the risk of damage, fragmentation, and surface disturbances on woodland resources.

### **Alternative C**

The objective for Alternative C is the same as the Alternative B objective.

Under Alternative C, the BLM would not open any acres to commercial harvest and would open **738,400** acres to noncommercial harvest. The remaining acres would be closed to noncommercial woodland products. Management direction for Alternative C would allow for the noncommercial harvest of forestry and woodland products in designated wood harvesting areas. However, Alternative C would prohibit noncommercial harvest of forestry and woodland products in the following areas:

- WSAs
- Lands with wilderness characteristics managed for protection
- Ponderosa pine, Douglas-fir, mixed conifer, and aspen stands
- Areas undergoing restoration
- 330 feet from riparian areas

The management direction stated above is more restrictive than alternatives A and B, which only would prohibit the removal of ponderosa pine for Christmas trees and allow for noncommercial harvest for the purposes of promoting or sustaining forest health.



Alternative C would allow noncommercial harvest on 738,400 acres, a 25 percent reduction from Alternative A.

Recreation could impact forestry and woodlands by spreading noxious and invasive weeds, increasing the risk of wildfire, and causing ground disturbances, especially OHV use. Under Alternative C, the BLM would not open any acres to cross-country OHV use. OHV travel would be limited to designated routes on 656,200 acres, and 1,209,400 acres would be closed to OHV use. Compared with alternative A and B, Alternative C would have fewer acres open to OHV use, thereby reducing the risk of damage, fragmentation, and surface disturbances on woodland resources.

Managing recreational areas under Alternative C could similarly concentrate recreational use, including motorized use into areas that provide facilities catering to these uses. This could also concentrate the potential disturbance. This would likely include the front country and passage areas, which would provide the greatest number of developed facilities. Potential effects in the outback area would be limited to designated roads and routes. The potential for recreation effects would be lowest in the primitive area, as motorized use and developed facilities would not be present.

#### **Alternative D**

Alternative D's objective is to maintain, enhance, and/or restore forest and woodland health. This objective differs from Alternative A's objective to improve forest and woodland health. Both alternatives aim to protect watershed values and wildlife habitat.

Under Alternative D, the BLM would open no acres to commercial harvest and noncommercial harvest. Alternative D would be similar to alternative B and C, except Alternative D would prohibit commercial and noncommercial harvest of forestry and woodland products unless the harvest furthers the protection of GSENM objects.

In terms of management direction for commercial and noncommercial fuelwood harvest, Alternative D would be more restrictive than Alternative A because the use would not be allowed.

Vegetation management under Alternative D would prioritize natural processes and techniques, compared with active restoration under Alternative A.

#### **Alternative E**

Alternative E's objective is to manage forest and woodland health in a manner that maintains and restores forest and woodland health, including watershed values, healthy soils, and maintenance of plant and wildlife habitats.

As under Alternative C, Alternative E prohibits the commercial harvest of forestry and woodland products and allows for the BLM to consider noncommercial harvest on 649,700 acres.

Under Alternative E, determinations to allow for the harvest of forestry and woodland products would be made by the BLM on a site-specific basis, consistent with the protection of GSENM objects and in accordance with applicable law. Additionally, areas and species available for collection would be determined as climatic conditions allow as well as ensuring maintenance and health of the applicable ecosystems.

As under Alternative C, OHV travel would be limited to designated routes on 620,000 acres, and 1,245,600 acres would be closed to OHV use.

Harvest of forestry and woodland products would be prohibited in WSAs; lands with wilderness characteristics managed for protection; ponderosa pine, Douglas-fir, mixed conifer, and aspen stands; areas undergoing restoration; and within 330 feet from riparian areas.

### **Cumulative Impacts**

The BLM-managed, Forest Service-managed, NPS-managed, and adjacent state, tribal, county, and privately owned land surrounding GSENM are the cumulative effects analysis area for forestry and woodland products management. Ongoing and planned actions in and near GSENM would influence forestry and woodland products management's effectiveness on a regional scale. The time frame for cumulative environmental consequences for future actions is the life of the plan.

The cumulative impacts of past and present management actions on woodlands in the planning area are captured in the description of the affected environment (**Section 3.15.1 and Appendix I, Section I.15**).

Reasonably foreseeable future actions in GSENM have the potential to impact forestry and woodland products management; these are generally projects that would alter product harvest areas or access to woodland and forest harvest areas, sustain or increase forest health and future harvest opportunities. Projects that are anticipated to sustain or increase forest health and maintain opportunities for future forestry and include the Skutumpah Terrace Greater Sage-grouse Habitat Restoration Projects and post-fire restoration projects. Projects that may increase the potential for human-caused fire ignitions are ROW development projects, including the Newer Garkane Transmission ROW (Buckskin to Fredonia Powerline), the Garkane Transmission ROW, and Lake Powell Pipeline ROW.

Proposed forestry and woodland product harvest management activities under Alternatives B, C, D, and E would contribute to the cumulative effects of regional fire and fuels management by other agencies and stakeholders. These efforts would contribute to maintaining and restoring forest and woodland health to protect watershed values, support wildlife habitat requirements, and reduce the potential for catastrophic wildfires. Where Alternatives B, C, D, and E prioritize forest restoration and woodland health, they could have greater contributions toward these effects.

### **3.16 LIVESTOCK GRAZING**

Presidential Proclamation 10286 speaks specifically to livestock grazing by stating:

“The Secretary shall manage livestock grazing as authorized under existing permits or leases, and subject to appropriate terms and conditions in accordance with existing laws and regulations, consistent with the care and management of the objects identified above and in Proclamation 6920. Should grazing permits or leases be voluntarily relinquished by existing holders, the Secretary shall retire from livestock grazing the lands covered by such permits or leases pursuant to the processes of applicable law. Forage shall not be reallocated for livestock grazing purposes unless the Secretary specifically finds that such reallocation will advance the purposes of this proclamation and Proclamation 6920.”

### 3.16.1 Affected Environment

#### Current Conditions

The livestock grazing planning area is 2,257,200 acres and is comprised of all BLM-managed livestock grazing allotments. The livestock grazing planning area contains 2,117,300 acres available for livestock grazing and 139,900 allotted acres that are unavailable for livestock grazing (Figure 2-18, Appendix A). The livestock grazing decision area (1,865,600 acres) includes 76 active BLM-managed livestock grazing allotments in GSENM; 14 allotments are completely or partially unavailable for grazing. There are 10 vacant allotments available for grazing but livestock are currently not present because no permits have been authorized for these allotments.

The total AUMs permitted in the decision area is 105,452 AUMs (76,207 active AUMs and 29,245 suspended AUMs). The 2020 Approved RMPs also directed the BLM to activate all suspended AUMs (BLM 2020a, 2020b). However, the BLM has not yet completed any permit renewals that would move the suspended AUMs to the active category.

#### Trends

Actual (billed) use (42,377 AUMs) totaled approximately 55 percent of permitted use (76,207 AUMs) on average between 1996 and 2020. Actual use means where, how many, and what kind or class of livestock, and how long livestock graze on an allotment, or on a portion or pasture of an allotment (43 CFR 4100.0–5).

Proper riparian management and improvement continue to be a high priority. Riparian areas comprise only a small fraction of the total BLM-managed acreage but receive a disproportionate amount of use, while providing key habitat for wildlife. The BLM coordinates water quality monitoring with other federal, state, and technical agencies, and BLM Utah Rangeland Health Standards are assessed according to BLM Handbook H-4180-1, Rangeland Health Standards (BLM 2001). See Appendix I, Table I-23 for greater detail on allotments not meeting rangeland health standards and actions taken since 2006. The BLM continues to monitor and assess rangeland conditions through a variety of landscape-scale and site-specific data, such as AIM strategy data, the landscape monitoring framework, and the LANDFIRE VCC. However, few land health assessments have been completed since 2006.

#### Forecasts

The BLM forecasts that the demand for livestock forage and livestock permits will continue. Local ranchers have stressed the importance of the area to their ranching operations and the importance of ranching to their families. An overall increase in area visitation has also resulted in livestock grazing and recreational use conflicts, such as access issues and damage to range improvements.

There is direct competition for forage and water between livestock and wildlife in some areas, especially in riparian areas. Structural and nonstructural range improvements across the livestock grazing decision area will reduce wildlife-livestock conflicts. Range improvements are generally used to assist with livestock management, but some are also used to assist with wildlife management, such as fences.

The BLM forecasts that feral cattle removals will continue in the Escalante River corridor and throughout GSENM as needed.

As discussed in **Section 3.3**, Vegetation, ongoing and planned vegetation management provide quality habitat for wildlife and livestock. Vegetation management may involve rest from grazing for the establishment of seeded species. See [Appendix I, Section I.15](#) for greater detail.

### 3.16.2 Environmental Consequences

Refer to **Section F.21**, Livestock Grazing, in **Appendix F**, Analytical Framework, for descriptions of the indicators, analysis areas, and assumptions used for the following analysis.

#### **Issue**

- How would proposed management impact livestock grazing and ranching operations under existing permits and leases?
- How would proposed management affect rangeland condition?

This analysis assesses the potential impacts on rangelands and grazing in all current allotments in the livestock grazing decision area. Because grazing operations are generally confined to allotments, the discussion of the impacts from the alternatives below would apply only to allotments available and unavailable for grazing in GSENM. This includes those that are active, vacant, or [made unavailable](#). Impacts are analyzed for the life of this RMP.

Several management actions would impact permitted livestock grazing. These include changes to the terms and conditions of livestock grazing permits, land allocation decisions, activities associated with the lands and realty program, changes to recreation management and recreation activities, special land use designations, and changes to vegetation and forest management.

The indicators of effects on livestock grazing from GSENM management include changes to allotment availability or acres available for grazing; changes to the terms and conditions of grazing permits, including alterations to the stocking rate, season of use, and permitted AUMs; and the quality and quantity of forage in allotments, including forage removal through land use allocations or anticipated changes to forage from vegetation management.

In April 2023, the NPS sent a letter to the BLM, requesting that the BLM include designation of 11 allotments and pastures in Glen Canyon as unavailable to livestock grazing within at least one alternative of the GSENM RMP. Six of the 11 allotments/pastures have active livestock grazing permits and the remaining five allotments do not have active livestock grazing permits because they have historically been unallotted or unavailable for livestock grazing for varied reasons. These five allotments were made available in the 2020 RMPs, but the BLM has not issued any permits for these allotments to date. In response to this request the BLM analyzed in the Draft RMP/EIS the five unpermitted allotments and the other six allotments with active permits as unavailable for the portions of those allotments/pastures within the Glen Canyon under Alternatives C and D.

In March 2024, Glen Canyon sent a follow-up letter to the BLM, requesting to rescind the request they previously made in the April 2023 letter and that the BLM not analyze the previously listed allotment as unavailable to eliminate the public's misunderstanding that the BLM's plan would make decisions that would impact lands managed by the NPS (Glen Canyon NRA). Further noting that Glen Canyon will develop and lead their own resource planning effort. The BLM sent a response to Glen Canyon confirming

receipt of the request to rescind the previous request and confirmed the intent of the letter and detailed how the BLM would revise alternatives C and D in the Proposed RMP and Final EIS to meet the request.

In the Proposed RMP and Final EIS the BLM has revised and removed the unavailable acres and AUMs in alternatives C and D associated with the Glen Canyon portions of the six allotments with active permits. For the five allotments/pastures that do not have active permits and were previously unallotted or unavailable for livestock grazing prior to the 2020 RMPs, the BLM will continue to analyze them as unavailable. Alternative E does not include acres within Glen Canyon, only acres within the boundaries of GSENM are included in Alternative E.

### **Impacts Common to All Alternatives**

The BLM would manage rangelands consistent with protection of GSENM objects of historic or scientific interest. Management to protect GSENM objects across the decision area could result in changed terms and conditions of grazing permits to prevent impacts from livestock on GSENM objects. Changes could include reduced stocking rate, changed duration or season of use, or other flexibilities in grazing permits to promote GSENM object protection. [Changes to grazing permits, as well as renewals, would require at least an EA-level NEPA to ensure protection of GSENM objects .](#)

The alternatives indicate whether to [allocate as unavailable](#), establish a [forage reserve](#)<sup>16</sup>, or reallocate vacant allotments. Under all alternatives, some allotments or pastures would be made unavailable for grazing [including through voluntary permit or lease relinquishment](#).

[Under Alternative A, no range improvements would be implemented for the primary purpose of increasing forage for livestock, while under Alternatives B, C, D, and E nonstructural range improvements with a primary purpose of increasing forage for livestock would be prohibited.](#) Prioritizing maintenance or improvement of [existing](#) structural range improvements, such as fences and water developments; and nonstructural range improvements [allowable under all alternatives](#), such as seedings and mineral blocks, would improve the overall rangeland condition by protecting sensitive areas, including riparian zones, and increasing the overall livestock distribution across the landscape. Increased livestock dispersal would contribute to improved range conditions throughout each allotment by allowing previously high-use areas to recover and encouraging grazing in underutilized areas where decadent vegetation can benefit from light disturbance. Conversely, alternatives that limit structural and nonstructural range improvements may limit or reduce AUMs on allotments where it is impractical to manage livestock without maintenance and construction of range improvements.

Under all alternatives, changing livestock AUM allocations would vary by either reducing, increasing, or maintaining the availability of forage for livestock grazing operations. Reducing available AUMs could impact grazing operations by limiting the number of, or total production of, livestock. Loss of the ability to graze livestock on BLM-managed lands would impact the ability of local ranching operations to persist. In the long term, loss of AUMs could lead to reduced economic output [in local communities](#) and reduced ranching operations continuity. While ranching operations are required to have adequate amounts of base property to support their livestock, the inability to graze livestock on BLM-managed lands would have

---

<sup>16</sup> Forage reserve allotments are a designation for a type of allotment on which there is no current term permit obligation for some portion of or all the estimated livestock grazing capacity, and where there has been a project-level environmental analysis and decision made to infrequently use the available forage on the allotment to enhance management flexibility for authorized livestock use or to achieve a desired vegetation condition.

substantial economic impacts on operations due to increased need for feed/forage. Conversely, increasing the number of AUMs has the potential to increase economic output by making more forage available for livestock. Additional economic analysis can be found in **Section 3.21**, Social and Economic Values.

**Feral cattle removals would continue under all alternatives.**

All alternatives would continue to manage WSAs and ISAs under the Wilderness Act of 1964; grazing on existing active allotments within these areas **could** remain available. Pursuant to the nonimpairment standard, the BLM manages WSAs to prevent impairment of the suitability of such areas for preservation as wilderness, until Congress passes legislation to either designate them as part of the National Wilderness Preservation System or release them from further study or protection. Thus, WSAs and ISAs would continue to be managed in a manner that would not impair their ability to be designated as Wilderness. Thus, in accordance with the Wilderness Act of 1964, section 4(d)(4)(2), minimum requirements for livestock grazing administration, such as motor vehicle use, would be permitted for livestock administration and range infrastructure maintenance. However, the nonimpairment standard would reduce the flexibility of allotment permit holders to use motor vehicles to gather and move livestock and create new range improvements.

Meeting minimum requirements for livestock administration in WSAs and ISAs could restrict motor vehicle use and reduce opportunities for permittees to maintain structural range developments, haul salt and minerals, and retrieve sick or injured animals. Under all alternatives, over the long term, management direction for WSAs and ISAs could improve overall range and forage condition through these designated area protections. Managing areas as ROW exclusion and closing them to OHV use would prevent impacts on livestock grazing from surface-disturbing activities, as well as negative interactions with recreationists, such as harassment of livestock by OHV use.

Inventoried lands with wilderness characteristics would not be afforded minimum requirements and nonimpairment standards like WSAs and ISAs. Therefore, livestock grazing use, including vehicle use for administrative livestock administration within active allotments, would continue under all alternatives, regardless of location within or outside lands with wilderness characteristics.

Under all alternatives, livestock grazing operations could be impacted by protecting eligible or suitable WSRs. This is because livestock grazing operations would be limited to not adversely impact or otherwise degrade each eligible or suitable WSR segment's ORVs. Limitations could include constructing new range improvements, such as water developments or fences, or mineral lick placement within eligible or suitable WSR corridors. However, existing livestock grazing practices and related structures are not affected by eligible or suitable WSR segments, because grazing is compatible with all tentative classifications (wild, scenic, and recreational). Livestock grazing may occur in an eligible or suitable WSR corridor, as long as the uses do not adversely impact the ORVs.

ROW authorizations foreseeable in areas open to ROWs or in ROW avoidance areas include, but are not limited to, construction of roads, facilities, and structures; removal or manipulation of vegetation; trampling of vegetation by overland OHV travel; and grading or excavation of the land surface. Any surface-disturbing activities within ROWs can remove or lower the quality of available forage for livestock. On a site-specific level, grazing operations could be enhanced by ROW authorizations such as road improvements or construction, as these could facilitate increased access to pastures and allotments for operators.

OHV closures under the alternatives could reduce impacts from trampling of vegetation by overland OHV travel, as well as reducing access to range improvements by operators.

Generally for land allocations, the greater size of an area allocation would result in more ground-disturbing activities that are authorized, thus a greater potential impact on livestock grazing activities and forage. Activities that result in vegetation removal or natural surface feature disturbance could impact forage quality and availability, resulting in a potential loss of available AUMs. Areas that are managed as ROW exclusion would be subject to the fewest potential ground-disturbing activities and, therefore, would have the least impact on livestock grazing operations. Areas that are managed as ROW avoidance areas would have more potential for impacts on livestock grazing than ROW exclusion areas. The greatest impacts on livestock grazing would result from ground disturbance in areas that are open to ROW authorization.

While primitive and nonmotorized recreation such as hiking, mountain biking, recreational shooting, and dispersed camping generally have fewer impacts than motorized recreation, shared use of rangelands can result in vegetation trampling, fragmentation, and increased weed invasion, thus lowering forage quality. Additionally, user-livestock conflicts, such as not securing gates or recreational shooting fence posts, could impact livestock grazing operations. For example, unlocked gates or damaged fence posts could allow cattle to escape pastures and trespass onto other lands. Recent and future recreational use increases across the planning area are likely to intensify conflicts among recreationists and livestock across all alternatives.

Under all alternatives, motorized recreation in GSENM would continue at varying levels, which could affect livestock administration and forage condition. Recreational motorized vehicles could lead to conflicts with livestock and operators, as well as a reduction of forage quality and availability from crushing vegetation through trail widening or unauthorized off-trail use. Motorized recreation could directly impact livestock through vehicle collisions and stress from noise and human presence. Motorized recreation is also known to increase the spread of invasive plants, further reducing forage quality (Wolf et al. 2017). Additionally, motorized recreation without the use of proper spark arresters could lead to spark-ignited wildfires, resulting in the loss of available forage. Impacts from motorized recreation could lead to both short- and long-term impacts on vegetation, which could result in a loss of AUMs. Additionally, fugitive dust can increase the incidence of dust pneumonia in livestock and reduce forage palatability.

Primitive and nonmotorized recreation would continue at varying levels under all alternatives, which could affect livestock by reducing forage quality or affecting livestock grazing operations. The potential impacts of mismanaged or heavy nonmotorized recreation on rangelands include erosion and trail damage, increased trail footprints, trampled vegetation, and increased invasive plant spread. All these could reduce forage quality and availability over the short and long terms.

All alternatives would allow vegetation management, though the treatment methods and acres would vary by alternative, as discussed below. Over the short term, vegetation management projects, including timber harvest, mechanical thinning, and prescribed fire, would affect rangelands by removing forage and by compacting or eroding soils for one or more growing seasons, potentially up to 5 years. Pastures that have received vegetation management may need to be rested or deferred during treatments and restoration, thus removing forage availability in those areas during regrowth. However, vegetation management is generally planned with permittees to occur around grazing rotations when livestock are not present, to minimize impacts on grazing operations.

Over the long term, vegetation management would enhance forage quality and availability, potentially leading to increased forage and AUMs, as evaluated during subsequent plan amendments or implementation-level NEPA analysis. Under all alternatives, vegetation management would help move vegetation communities and fuels loading toward more desirable and resilient conditions, thereby reducing the risk of uncharacteristically large and landscape-altering wildfire. In addition, decreasing the fire risk would lower the potential for AUMs to be lost to wildfire.

All alternatives include protecting sensitive natural resources, such as restoring PFC in riparian zones. This management could affect grazing operations by altering the timing, intensity, and availability of permitted grazing, thereby limiting livestock numbers and season of use authorized to grazing operators. Over the long term, additional protections of sensitive natural resources could lead to more sustainable vegetation conditions, which could increase forage availability for livestock.

While all alternatives have varying degrees of impacts on livestock grazing (see below), all alternatives would provide for the proper care and management of GSENM objects. Alternative A would have the lowest level of protections. Alternatives B, C, and E would offer progressively more protections, with Alternative D providing the most protections.

#### **Alternative A**

Under Alternative A, nearly all allotments would be available for livestock grazing, and all currently suspended AUMs would be activated over time through new allotment management plans supported by site-specific NEPA analysis (**Table 3-66**). Assessments would be conducted to determine the available AUMs on suspended pastures or allotments. Activating additional AUMs would increase the forage available for livestock grazing operations. Alternative A does reflect the voluntary relinquishment of a livestock grazing permit for the Big Bowns Bench allotment. This relinquishment permanently retires approximately 18,600 acres and unallocated 750 AUMs that cannot be reallocated for livestock purposes unless reallocation will advance the purposes of Proclamation 10286 and Proclamation 6920.

**Table 3-66. Livestock Grazing Availability and AUM Allocations by Alternative**

| <b>Livestock Grazing</b>                | <b>Alternative A</b> | <b>Alternative B</b> | <b>Alternative C</b> | <b>Alternative D</b> | <b>Alternative E</b> |
|---|----------------------|----------------------|----------------------|----------------------|----------------------|
| <b>Planning Area</b>                    |                      |                      |                      |                      |                      |
| Acres available for livestock grazing   | 2,117,300            | 2,042,100            | 2,042,100            | 918,300              | 1,737,300            |
| Acres unavailable for livestock grazing | 139,900              | 215,100              | 215,100              | 1,338,900            | 128,300              |
| AUMs allocated for livestock grazing    | 107,995              | 105,034              | 105,034              | 43,970               | 104,980              |
| <b>Decision Area</b>                    |                      |                      |                      |                      |                      |
| Acres available for livestock grazing   | 1,817,800            | 1,742,600            | 1,742,600            | 686,300              | 1,737,300            |
| Acres unavailable for livestock grazing | 47,800               | 123,000              | 123,000              | 1,179,300            | 128,300              |

Source: BLM GIS 2022

The goals and objectives under Alternative A would maintain, restore, and enhance the overall condition of rangeland ecosystems based on standards not being met, as stated in **Appendix I, Table I-23**. Adaptive management of livestock grazing permit terms and conditions would lead to short-term changes in livestock administration, including changes to season of use, duration of use, and forage allocations, to



promote BLM Utah Rangeland Health Standards. Over the short term, changes to permit terms and conditions could limit the forage available for livestock grazing operations. However, improving overall rangeland condition through actions such as maintenance or restoration of nonstructural (seedings) and structural range improvements would lead to greater rangeland health and could lead to increased available AUMs over the long term.

All existing WSAs and ISAs would remain; impacts on livestock grazing in these areas would be as described under Impacts Common to All Alternatives. WSAs or ISAs released from wilderness consideration would be managed in accordance with the goals, objectives, and management prescriptions for rangelands under the RMP and would not receive nonimpairment standard protections, thus livestock grazing operations would be afforded increased flexibility with regard to motorized vehicle use and maintenance or construction of range improvements.

Lands with wilderness characteristics would not be managed to protect those characteristics (Table 3-67), so there would be no impact on forage or livestock grazing operations in those units.

**Table 3-67. Acres Available for Livestock Grazing within Lands with Wilderness Characteristics**

| Management Type   | Alternative A | Alternative B | Alternative C | Alternative D | Alternative E |
|---|---------------|---------------|---------------|---------------|---------------|
| Lands managed to protect wilderness characteristics   | 0             | 65,900        | 231,600       | 308,600       | 306,100       |
| Lands managed for discretionary action while not protecting lands with wilderness characteristics | 552,900       | 466,700       | 5,900         | 0             | 5,600         |

Source: BLM GIS 2022

Management under Alternative A would maintain existing land management practices and acreages for ROWs; impacts would be as described under *Impacts Common to All Alternatives*.

Alternative A would manage the most acres of ERMA of all alternatives and the fewest acres of SRMAs. ERMAs are generally less restrictive of recreation activities than SRMA, as recreation is typically more distributed in ERMAs than in SRMAs. Recreation activities under Alternative A would have the potential to impact livestock grazing in terms of potential conflicts between livestock and recreationists, as well as direct impacts on forage vegetation from recreation activities.

OHV travel on designated routes would continue to be allowed in the majority of GSENM. OHV travel and recreation use is expected to continue creating vegetation damage, trail widening, and user conflicts with livestock.

Prioritization of rangeland health using the full suite of vegetation management methods would remove forage over the short term, but could improve overall forage quality and quality and rangeland condition over the long term. Optimizing rangeland health could create conditions that would improve forage productivity. Rangeland vegetation would continue trending toward conversion to pinyon-juniper woodland, with increased invasion of invasive annual grasses, such as cheatgrass. These conditions would lead to vegetation conditions that are less resistant to and resilient from wildfire, and the potential for forage loss from wildfire would increase.

### **Alternative B**

The goals and objectives under Alternative B facilitate landscape-scale restoration projects and would increase rangeland resiliency to drought and wildfire. This could lead to overall rangeland condition improvement in the decision area, compared with Alternative A.

Alternative B would make unavailable approximately 75,200 additional acres of allotments than under Alternative A **Table 3-66**) in both the planning area and the decision area, as the additional unavailable allotments occur within GSENM. This acreage consists of 11 allotments/pastures listed below that were unavailable prior to the 2020 RMPs have not been used for livestock grazing since prior to the establishment of GSENM and are largely in a natural state and currently do not have permits (BLM 2020a and BLM 2020b). Three of the allotments/pastures that were previously designated as forage reserves prior to the 2020 RMPs have not be consistently utilized since their designation in the 2000 MMP and are therefore largely in a natural state and currently do not have permits. These allotments have not been used for livestock grazing or have incurred minimal use (forage reserves) since prior to the 1999 amendment and are therefore largely in a natural state. Managing fewer acres as available for livestock grazing would decrease the forage available for livestock grazing operations by 2,961 AUMs. The 2020 proposed RMPs and Final EIS made available the following 11 allotments/pastures. While the Final EIS did include some analysis for reopening these allotment/pastures, permitting of these allotments would be based on site-specific analysis (BLM 2020a and BLM 2020b). To retain protections originally authorized under the Escalante Management Framework Plan (BLM 1979), Vermilion Management Framework Plan (BLM 1979) and subsequent amendment (BLM 1999), Alternative B would make unavailable the following allotments/pastures.

Antone Flat – Made unavailable under the Escalante Management Framework Plan. The rationale for continued unallotted status was for high watershed and wildlife values along with steep and rough terrain. (BLM 1999).

Deer Creek Allotment, Cottonwood pasture – The Cottonwood pasture was made unavailable in a 1999 amendment to the Escalante Management Framework Plan (BLM 1999) for riparian resource concerns and recreation conflicts.

Deer Creek Allotment, Wolverine Bench Pasture – Allocated as a forage reserve (BLM 1999).

Little Bown's Bench – Allocated as a forage reserve (BLM 1999).

Longneck – Made unavailable through the Escalante Management Framework Plan (BLM 1979). Allotment is unsuitable for grazing or contains few suitable AUMs that livestock grazing is not practical (BLM 1979).

Long Canyon Strock Driveway – Unallotted area. Not currently part of any allotment authorized for grazing in GSENM by the BLM.

McGath Point – McGath Point was made unavailable in a 1999 amendment to the Escalante Management Framework Plan (BLM 1999) for riparian resource concerns and recreation conflicts.

Phipps Allotment, Phipps pasture – A portion of the Phipps pasture along the Escalante River was made unavailable in a 1999 amendment to the Escalante Management Framework Plan for riparian resource concerns and recreation conflicts. The remaining portion was allocated as a forage reserve. (BLM 1999).

Rock Creek-Mudholes Allotment, Middle Rock Creek pasture – The Middle Rock Creek pasture was made unavailable in the 1979 Escalante Monument Framework Plan (BLM 1979) due to slope and topography, lack of access, and limited forage. This would mitigate watershed/livestock grazing conflicts and provide for any future bighorn sheep transplants.

Saltwater Creek – Saltwater Creek was made unavailable in a 1999 amendment to the Escalante Management Framework Plan (BLM 1999) for riparian resource concerns and recreation conflicts.

Steep Creek – Steep Creek was made unavailable in a 1999 amendment to the Escalante Management Framework Plan (BLM 1999) for riparian resource concerns and recreation conflicts.

Upper Paria, South Unallotted Area – Not currently part of any allotment authorized for grazing in GSENM by the BLM. This is primarily due to topography as it is extremely rugged and incised with deep canyons and narrow ridges. The topography also makes the area difficult to access and the dominant vegetation type provides minimal forage for grazing livestock.

Impacts on livestock grazing from WSA and ISA management under Alternative B would be the same as those described under Alternative A. Under Alternative B, WSAs or ISAs released from wilderness consideration would continue to be managed in accordance with past management prescriptions and would continue to receive nonimpairment standard protections, consistent with the protection of GSENM objects, until a new wilderness inventory has taken place to establish new management prescriptions. In these areas, livestock grazing operations would not be afforded increased flexibility unless a wilderness inventory has taken place within the released WSA or ISA.

Alternative B would designate the Fiftymile Mountain RNA (ACEC), which is approximately 54,800 acres and overlaps an active grazing allotment. The BLM would develop a cultural resources monitoring plan and coordinate with the permittee to identify potential impacts from livestock grazing. The cultural resources monitoring plan would include adaptive management thresholds that would indicate the appropriate level of grazing, including no grazing for the protection of cultural resources in the applicable allotment management plans. Grazing permit terms and conditions would change based on monitoring that revealed adverse impacts.

Alternative B would manage to protect 72,000 acres of lands with wilderness characteristics that overlap with active grazing allotments which are comprised of previous Utah Trust Lands Administration (formerly the Utah School and Institutional Trust Lands Association), inholdings within WSA boundaries (Table 3-67). Management to protect lands with wilderness characteristics could benefit forage quality and quantity by prohibiting some surface-disturbing activities. No management associated with protecting lands with wilderness characteristics under Alternative B would reduce forage availability or inhibit livestock grazing operation administration.

Impacts on livestock grazing from managing areas as ROW exclusion under Alternative B would be similar to those described under Alternative A; types of impacts would be as described under *Impacts Common to All Alternatives*. However, the number of acres open to ROW authorization would be 87 percent less under Alternative B (85,100 acres) than under Alternative A (630,400 acres). Restrictions on ROW development in these areas would have greater benefits on forage availability over the long term where allotments overlap with acres previously open to ROW authorization; therefore, impacts from potential development would be greatly reduced under Alternative B.

Alternative B would manage slightly fewer acres as ERMAs than Alternative A and would slightly increase acres of SRMAs. Impacts on livestock grazing would be similar to those described under Alternative A. However, because more SRMAs would be designated, the potential for recreation in these areas to impact livestock grazing in terms of potential conflicts between livestock and recreationists, as well as direct impacts on forage vegetation from recreation activities, would be increased.

Compared with Alternative A, Alternative B would reduce available OHV areas by closing WSAs/ISAs, lands with wilderness characteristics identified for protection, and No Mans Mesa RNA (ACEC), totaling approximately 952,000 acres. Alternative B would allocate as unavailable an additional 950,500 acres, compared with Alternative A, and would reduce impacts on livestock from user-related conflicts and forage trampling or removal.

Vegetation management under Alternative B would focus on landscape-scale restoration projects, such as seedings, to increase vegetation community climate resiliency. This would help maintain forage extent and quality in the long term. Vegetation restoration would move rangeland health toward desired conditions to a greater extent than under Alternative A by increasing forage quality and resiliency on a larger scale. Because vegetation removal and restoration-associated surface disturbance would occur over a larger area under Alternative B than under Alternative A, short-term impacts on forage quality and quantity may occur on a larger scale than under Alternative A.

Alternative B would require that land health assessments be complemented within 2 years of the signing of the ROD, including causal factor determinations, across nine watersheds identified in **Chapter 2**. This could impact livestock grazing operations through changed permit terms and conditions, including forage allocations, depending on causal factor determinations. Identification of causal factor determinations by conducting land health assessments within these watersheds would lead to improved forage conditions within overlapping allotments over the long term, as management actions would be taken to fulfill the appropriate land health standards.

New discretionary actions would be avoided within a 330-foot buffer of riparian and wetland areas, unless the action would result in no net loss of riparian or wetland resources, which could result in site-specific impacts on livestock grazing operations.

### **Alternative C**

The goals and objectives under Alternative C focus on protecting existing landscapes while allowing for management of discretionary actions, such as livestock grazing, consistent with protecting GSENM objects.

Alternative C would manage the same allotments acres as unavailable for livestock grazing as under Alternative B. (Table 3-66). Reducing areas available for livestock grazing would decrease available forage under alternatives B and C by 4 percent, compared with Alternative A.

Livestock grazing under Alternative C would be managed the same as under Alternative B and in a manner that is consistent with the protection of GSENM objects. Allotments that are not currently under permit would be made unavailable for livestock grazing. Alternative C would make the same allotments unavailable as Alternative B, and impacts would be the same as Alternative B. Alternative C, like Alternative B would require land health assessments within 2 years on allotments within watersheds that have shown a substantial departure from historical conditions. Changes in grazing terms and conditions would be made if livestock are determined to be the causal factor according to the results of the land health assessments

and determinations; impacts from changes to terms and conditions would be as described under *Impacts Common to All Alternatives*. Additionally, no new structural range improvements would be permitted until a land health assessment and determination is completed for the allotment, unless the improvement would prevent imminent damage to GSENM objects.

Impacts on livestock grazing from WSA and ISA management under Alternative C would be the same as those described under Alternative A. If WSAs were released from wilderness consideration, impacts on livestock grazing would be the same as those described under Alternative B. Impacts of designating the Fiftymile Mountain RNA (ACEC) under Alternative C would be the same as those described under Alternative B.

Alternative C would manage for the protection of approximately 231,600 acres of lands with wilderness characteristics that overlap with active grazing allotments (Table 3-67). Protection of lands with wilderness characteristics would benefit forage by preventing surface disturbance as described under *Impacts Common to All Alternatives*.

Alternative C would increase the acres of ROW exclusion and avoidance areas by approximately 282,200 acres and 338,900 acres, respectively, compared with Alternative A; types of impacts on livestock grazing from restricting ROW development would be as described under *Impacts Common to All Alternatives*. Acres open to ROW authorization would be 98 percent less (619,500 acres) under Alternative C (10,900 acres) than under Alternative A (630,400 acres).

Compared with Alternative A, Alternative C would manage approximately 3 times more acres of SRMAs and less than one-third the acres of ERMAs. Because SRMAs tend to concentrate recreational uses more so than ERMAs, there would be higher potential for impacts on livestock from recreation conflicts under Alternative C than under Alternatives A and B.

Alternative C would reduce available OHV areas from Alternative A and would have similar impacts as those described under Alternative B. Closing 806 times more acres (1,209,500 acres) to OHV use under Alternative C than under Alternative A would reduce impacts on livestock from user-related conflicts and forage trampling or removal.

Under Alternative C, restoration with native species would be prioritized; however, nonnative species may be used in phased restoration efforts that lead towards a native vegetation community. Opportunities for seedings with nonnative forage would be similar to those described under Alternative B but would be reduced under Alternative C. Other impacts on livestock grazing under this alternative would be like those described under Alternative B, though there may be fewer opportunities to return degraded forage to desired conditions without widespread restoration activities. However, when compared with Alternative A, there would be more opportunities to increase rangeland health with native restoration under Alternative C.

Alternative C also includes the same management direction to complete rangeland health assessments and causal determinations as under Alternative B and impacts would be as described under Alternative B.

#### **Alternative D**

Alternative D would maximize natural processes through limiting all discretionary actions, including livestock grazing. Passive management of rangelands would be the primary approach under this alternative.

Alternative D would manage the most acres as unavailable for livestock grazing of all the alternatives. This alternative would reduce areas available for livestock grazing by 1,199,000 acres in the planning area and 1,131,500 acres in the decision area, compared with Alternative A (Table 3-66). Alternative D would reduce the number of AUMs available across the planning area to reflect active use, discontinuing suspended AUMs resulting in a decrease of more than 50 percent when compared with all other alternatives and by 64,025 AUMs (59 percent) from Alternative A.

Like Alternative C, under Alternative D, allotments that are not currently under permit would be made unavailable for livestock grazing. Allotments and pastures managed as unavailable for livestock grazing under Alternative D would include all those in Alternative C. Additional allotments and pastures that would be made unavailable under Alternative D were based on AIM data that identified departed watersheds within those pastures or allotments. These closures would also take place for the protection of riparian and upland vegetation, as well as cultural resources. The BLM would conduct rangeland health assessments and fully processed permit renewals within 10 years on all remaining allotments. Like Alternative C, new structural range improvements would not be permitted until a land health assessment and determination is completed for the allotment, unless the improvement would prevent imminent damage to GSENM objects. Also, like Alternative C, seedings and other nonstructural range improvements with a primary purpose of increasing livestock forage would not be permitted under Alternative D.

Impacts on livestock grazing from WSA and ISA management under Alternative D would be the same as those described under Alternative A. If WSAs were released from wilderness consideration, they would continue to be managed in accordance with past management prescriptions and would continue to receive nonimpairment standard protections, consistent with the protection of GSENM objects, until a new wilderness inventory establishes new management prescriptions. In these areas, livestock grazing operations would not be afforded increased flexibility, unless a wilderness inventory has occurred within the released WSA or ISA.

Alternative D would manage for the protection of approximately 308,600 acres of lands with wilderness characteristics that overlap with active grazing allotments (Table 3-67). Protection of lands with wilderness characteristics would benefit forage by preventing surface disturbance as described under *Impacts Common to All Alternatives*.

Alternative D would manage 83 percent more acres as ROW exclusion areas than Alternative A (1,608,800 acres and 881,300 acres, respectively). Types of impacts on livestock grazing from restricting ROW development would be as described under *Impacts Common to All Alternatives*.

Alternative D would manage less acreage of SRMAs than Alternative C and 3 percent more acres than Alternative A. Approximately 17 percent the acreage of ERMA would be designated under Alternative D, compared with Alternative A. Because SRMAs are more restrictive of recreational uses than ERMAs, there would be fewer impacts on livestock from recreation conflicts under Alternative D than under Alternative A.

Alternative D would designate more lands as made unavailable to OHV use than any other alternative. Closing an additional 1,436,500 (959 times more) acres to OHV use under Alternative D, compared with Alternative A, would reduce impacts on livestock from user-related conflicts and forage trampling or removal.

Vegetation management under Alternative D would focus on widespread vegetation restoration while prioritizing natural techniques for land health recovery. Like Alternative C, opportunities for seedings with nonnative forage would be reduced under this alternative compared with Alternatives A. Prioritizing natural processes and reducing opportunities to use nonnative forage species under this alternative could lead to an increase in invasive annual grasses over the long term, as some nonnative species may help to inhibit the growth of invasive annuals. Other impacts on livestock grazing under this alternative would be like those described under Alternative B. However, when compared with Alternative A, there would be more opportunities to improve rangeland health with native restoration.

This alternative also includes the same management direction to complete rangeland health assessments and causal determinations as under Alternatives B, and impacts would be as described under Alternative B.

### **Alternative E**

Alternative E, like Alternative C, would focus on protecting existing landscapes while allowing for management of discretionary actions, such as livestock grazing, consistent with protecting GSENM objects.

Alternative E does not include acres outside of the decision area (i.e. lands managed by NPS on Glen Canyon), only acres within the boundaries of GSENM are included in Alternative E, resulting in less acres when comparing to all other alternatives. Alternative E would manage 128,300 acres as unavailable for livestock grazing, the least amount of unavailable acres when compared to all other alternatives. (**Table 3-66**). The same allotments would be made unavailable for grazing in Alternative E as in alternatives B and C, with the addition of four pastures within the Circle Cliffs, Cottonwood, and Upper Paria allotments that would allow for livestock trailing to adjacent or nearby allotments as necessary. These areas were made unavailable after consideration of public comments and evaluation of updated AIM data (see Appendix M). The Long Canyon Stock Driveway area, which was previously unallotted also remains unavailable for grazing but can allow trailing as necessary under Alternative E. Allotments available for grazing in Alternative E would also include 14,603 acres available as forage reserves, limited to nonrenewable permits and leases.

When compared with Alternative A, Alternative E would also reduce the total number of AUMs as the direct result of the Big Bowns relinquishment, allotments/pastures allocated as unavailable, and removing the AUM increase associated with the 11 previously unavailable allotments that were made available in the 2020 RMPs. However, there would be no net loss of permitted AUMs under Alternative E, as those areas made unavailable are not currently permitted. Over time, Alternative E could reduce the number of allocated AUMs through voluntary relinquishment of a grazing permit or lease. Thus, the number of allocated AUMs would automatically decrease by the number of AUMs authorized by that permit or lease at the time of relinquishment, unless the BLM determines that the reallocation of grazing forage associated with the relinquished permit or lease would advance the purposes of Proclamations 10286 and 6920. Additionally, the BLM would implement seasonal reductions in AUMs in allotments during drought years using the U.S. Drought Monitor as a guide to indicate drought.

Similar to Alternative C, changes in grazing terms and conditions would be made if livestock are determined to be the causal factor according to the results of the land health assessments and determinations; impacts from changes to terms and conditions would be as described under *Impacts Common to All Alternatives*.

Like Alternatives C and D, under Alternative E, allotments that are not currently under permit or those with voluntary relinquishment would be made unavailable for livestock grazing. Like Alternative C, new structural range improvements would not be permitted until a land health assessment and determination is completed for the allotment, unless the improvement would exclude livestock from an area and/or prevent imminent damage to GSENM objects. Also like Alternatives C and D seedings and other nonstructural range improvements with a primary purpose of increasing livestock forage would not be permitted under Alternative E.

Impacts on livestock grazing from WSA and ISA management under Alternative E would be the same as those described under Alternatives A and D. If WSAs were released from wilderness consideration, they would continue to be managed in accordance with past management prescriptions and would continue to receive nonimpairment standard protections, consistent with the protection of GSENM objects, until a new wilderness inventory establishes new management prescriptions. In these areas, livestock grazing operations would not be afforded increased flexibility, unless a wilderness inventory has occurred within the released WSA or ISA.

Alternative E would manage for the protection of approximately 306,100 acres of lands with wilderness characteristics that overlap with active grazing allotments (**Table 3-67**). Protection of lands with wilderness characteristics would benefit forage by preventing surface disturbance as described under *Impacts Common to All Alternatives*.

Alternative E would manage 32 percent more acres as ROW exclusion areas than Alternative A (1,251,800 acres and 881,300 acres, respectively). Types of impacts on livestock grazing from restricting ROW development would be as described under *Impacts Common to All Alternatives*.

Alternative E would manage the same acreage of SRMAs as Alternative C and approximately three times more acres than Alternative A. Approximately 27 percent the acreage of ERMA would be designated under Alternative E, compared with Alternative A. Because SRMAs are more restrictive of recreational uses than ERMAs, there would be fewer impacts on livestock from recreation conflicts under Alternative E than under Alternative A.

Alternative E would designate nearly the same acres of lands as closed to OHV as Alternative C. Closing 1,245,600 acres to OHV use under Alternative E would reduce impacts on livestock from user-related conflicts and forage trampling or removal when compared with Alternative A.

Under Alternative E, restoration with native species would be prioritized; however, nonnative species may be used in phased restoration efforts that lead towards a native vegetation community. Opportunities for seedings with nonnative forage would be similar to those described under Alternative B but would be reduced under Alternative E. Other impacts on livestock grazing under this alternative would be like those described under Alternative B, though there may be fewer opportunities to return degraded forage to desired conditions without widespread restoration activities. However, when compared with Alternative A, there would be more opportunities to increase rangeland health with native restoration under Alternative E.

This alternative also includes the same management direction to complete rangeland health assessments and causal determinations as under Alternatives B, and impacts would be as described under Alternative B.



### **Cumulative Impacts**

The cumulative impacts analysis area for livestock grazing includes allotments within the planning area. The area includes allotments and pasture areas that could be directly affected by management decisions and lands that could also experience impacts due to management decisions in the planning area, such as base property. The timeframe for the cumulative effects analysis is the life of the [RMP](#).

Cumulative impacts may result from activities on adjacent BLM-managed lands and national recreation areas, and in adjacent communities and from other resource-use activities. Past, present, and reasonably foreseeable range improvement projects in the analysis area could contribute to cumulative impacts on livestock grazing in the cumulative effects analysis area. Livestock grazing management is broadly consistent across federal land ownership due to adherence with current federal law, regulation, and policy, including adherence to the BLM Utah Standards and Guidelines for Rangeland Health. This means broad movement toward desired conditions would be facilitated across administrative boundaries in this region.

The cumulative impacts of past and present actions on livestock grazing management in the planning area are captured in the description of the affected environment. These past and existing rangeland management projects include the development or repair of water developments and pipelines, including the Rangeland Wells and Pipelines [project and the GSENM Water Catchment project \(Appendix F, Analytical Framework\)](#). In general, these projects would contribute to improving livestock grazing facilities and meeting BLM Utah Standards and Guidelines for Rangeland Health. Other relevant activities include ongoing and anticipated future increases in recreational activities, as recreation can potentially conflict with continued livestock grazing for the reasons discussed in *Impacts Common to All Alternatives*.

Proposed livestock grazing under all alternatives would have similar contributions to cumulative effects on rangeland condition in the planning area, as all alternatives would manage for the protection of GSENM objects, and in adherence to BLM Utah Standards and Guidelines for Rangeland Health. Proposed livestock grazing management under Alternative C would make a relatively high number of acres available to livestock grazing, while managing a relatively low number of acres of RMAs. As a result, the potential for recreation-livestock conflicts may be fewest under this alternative, and so this alternative would have the lowest contribution to cumulative effects in this respect. [Cumulative effects under Alternative E would be similar to those under C, with the same acreage of RMAs, but fewer available pastures and allotments made available for grazing.](#)

## **3.17 RECREATION**

### **3.17.1 Affected Environment**

#### **Current Conditions**

[This section summarizes the current conditions related to recreation for the GSENM planning area, additional detail is provided in Appendix I, Section I.16\).](#) The BLM reports recreation visitation estimates using the Recreation Management Information System, which is an internal database. The system estimates participation in 65 types of recreational activities recorded at BLM sites and areas based on registrations, permit records, observations, and professional judgment. Visitation is estimated by the number of visitors and visitor days. Visitors are the actual number of people who take part in a recreational activity. A visitor day is a common recreation unit of measure used among federal agencies that represents an aggregate of 12 visitor hours at a single site or area. Visitor days at GSENM increased from 742,586 in 2010, to 1,371,036 in 2021, and [then decreased slightly to 1,110,948 in 2022 \(BLM 2022a, 2023; BLM GIS 2022\).](#)

Recreation levels in the planning area have been monitored for many years; however, recorded visitor numbers are only a representation of the actual level of recreation use. Known types of recreational use in GSENM include hiking, camping, backpacking, bikepacking, ATV and UTV riding, automobile touring, equestrian activities, canyoneering, rock climbing, wildlife viewing, photography, and hunting. ATV and UTV use [have](#) become one of the fastest-growing recreational activities.

#### *Recreation Management Areas*

RMAs are the BLM's land use planning-level tool for managing recreational use of the BLM-managed lands. BLM-managed lands are identified for recreation as a SRMA or an ERMA. All lands that are not designated as either a SRMA or ERMA are considered BLM-managed lands not designated as RMAs, or non-RMA lands.

SRMAs recognize unique and distinctive recreation values; those values are managed to enhance a targeted set of activities, experiences, benefits, and recreational setting characteristics, which become the priority management focus. These areas often have high levels of recreation or valuable natural resources. ERMAs recognize existing recreational use, demand, or recreation and visitor services program investments. They are managed commensurate with other resources and resource uses to sustain the ERMA's principal recreational activities and associated qualities and conditions.

An RMA may be subdivided into RMZ to further delineate specific recreational opportunities. SRMAs may be subdivided into RMZs with discrete objectives. SRMA/RMZ objectives must [have measurable outcome-focused objectives. Supporting management actions and allowable use decisions are required to: 1\) sustain or enhance recreation objectives; 2\) protect the desired recreation setting characteristics; and 3\) constrain uses, including incompatible recreation activities that are detrimental to meeting recreation or other critical resource objectives.](#) ERMAs may be subdivided into RMZs to ensure recreation and visitor services are managed commensurate with the management of other resources and resource uses.

For non-RMA lands, the BLM manages the lands to meet basic recreation and visitor services and resource stewardship needs. Recreation is not emphasized on these lands; however, recreational activities and related management may occur, except on those lands closed to public use. Recreation and visitor services are managed to allow recreational uses that are not in conflict with the primary uses of these lands.

Currently, the BLM manages five SRMAs and two ERMAs in GSENM. These areas are shown in **Figure 3-39** (Recreation Management Areas, 2020 Management Plan) in **Appendix A**.

#### *Developed Recreation Sites*

Developed recreation sites are areas that incorporate visitor use with infrastructure such as roads, parking areas, and facilities that protect the resource and support recreation users in their pursuit of activities, experiences, and benefits. Examples of these sites are listed in **Table 3-68**. Visitor-use infrastructure is a management tool that can minimize impacts on resources, concentrate use, and reduce visitor conflicts. Developed recreation sites help accomplish these goals.

**Table 3-68. Current Day Use Sites and Trailheads by Unit**

| <b>RMA*</b>                | <b>Day Use Site or Contact Station</b>  | <b>Campground</b> | <b>Trailhead</b>  | <b>Point of Interest</b>  |
|----------------------------|---|-------------------|---|---|
| Escalante Canyons          | Devil's Garden  | Deer Creek        | Deer Creek<br>Early Weed<br>Egypt<br>Forty Mile Water Tank<br>Harris Wash<br>Horse Canyon<br>Hurricane Wash<br>Little Death Hollow<br>Red Well Lower Gulch<br>Wolverine<br>Upper Dry Fork<br>Lower Dry Fork | Dance Hall Rock<br><br>Twenty Mile<br>Dinosaur Track Site<br>Chimney Rock   |
| Highway 12 Corridor        | Cannonville Visitor Center<br><br>Escalante Visitor Center<br><br>Calf Creek Recreation Area    | Calf Creek        | Boulder Mail<br><br>Lower Calf Creek<br><br>Upper Calf Creek<br><br>Escalante River Bridge<br><br>Escalante River Town  | Highway 12 Blues Overlook<br>Highway 12 Fremont Granary<br>Highway 12 Hole-in-the-Rock<br>Highway 12 Head of the Rocks<br>Highway 12 Boynton Overlook |
| Highway 89 Corridor        | Big Water Visitor Center<br>Kanab Visitor Center<br>Old Paria Townsite<br>Paria Contact Station | White House       | Toad Stools<br><br>Great Western Trail North and South<br><br>White House   | Paria Overlook<br><br>Paria Townsite  |
| Paria Canyons and Plateaus | -   | Stateline         | Buckskin<br><br>Wire Pass   | -   |
| Paria/Hackberry            | Grosvenor Arch  | -                 | Cottonwood Narrows North and South<br><br>Paria Box<br>Lick Wash<br>Lower Hackberry<br>Round Valley Draw<br>Willis Creek<br>Bull Valley Gorge   | -   |

Sources: BLM 2000

\*RMAs reflect the 2000 MMP (BLM 2000)

*Commercial, Competitive, and Organized Group Recreation*

As authorized by 43 CFR Subpart 2932, Federal Lands Recreation Enhancement Act, and FLPMA, there are five types of uses for which SRPs are required: commercial, competitive, vending, individual or group

use in special areas, and organized group activity and event use. SRPs are issued to outfitters, guides, vendors, recreation clubs, and commercial competitive event organizers that provide recreational opportunities or services without using permanent facilities. The permits are issued to manage visitor use, protect natural and cultural resources, and accommodate commercial recreational uses. The BLM issues SRPs for noncommercial use in certain areas where a permit system for individual use would achieve management objectives. Large, noncommercial group activities outside developed campgrounds could require a SRP, if necessary, to meet planned resource management objectives or resource conditions. If the group or activity does not warrant an SRP, a letter of agreement is often used.

Commercial guiding activities often offer a specialized opportunity for the recreating public to experience activities that they themselves do not have the skills, equipment, or resource knowledge to experience independently. Some recreational use can be estimated through recreational activities requiring special permits. **Table 3-69** lists the numbers and types of SRPs (Recreation Management Information System data). Demand for SRPs has been increasing in the planning area. In 2021, the BLM issued 144 permits for activities including hiking, backpacking, vehicle and OHV tours, shuttle services, horseback riding, pack stock services, canyoneering, historical and educational programs, photography workshops, bicycle tours, outfitter-led hunting, therapeutic youth programs, and vending services.

ATV/UTV use has become a substantial component of recreational use. The Nephi Pasture region is a popular ATV/UTV recreation destination. Some locations receive unmanaged, intensive ATV/UTV use based on landscape characteristics and easy access from local communities.

**Table 3-69. Special Recreation Permits**

| <b>Recreational Activity</b>  | <b>Current Permits</b> |
|-------------------------------|------------------------|
| Art festival                  | 1                      |
| ATV jamboree                  | 2                      |
| Canyoneering                  | 6                      |
| Cycling                       | 6                      |
| Glamping                      | 1                      |
| Hiking/backpacking            | 41                     |
| Horseback riding              | 9                      |
| Hunting                       | 25                     |
| Llama pack trips              | 2                      |
| Outdoor education             | 20                     |
| Photography tours             | 8                      |
| OHV/vehicle/sightseeing tours | 19                     |
| Vending (Calf Creek firewood) | 1                      |
| Wilderness therapy            | 1                      |
| <b>Total Permits</b>          | <b>142</b>             |

Source: BLM 2022b

### 3.17.2 Environmental Consequences

Refer to **Section F.22**, Recreation, in **Appendix F**, Analytical Framework, for descriptions of the indicators, analysis areas, and assumptions used for the following analysis.

#### Issue

- How would proposed management affect the BLM's ability to provide recreational opportunities and infrastructure while protecting GSENM objects of historical and scientific interest?

### **Impacts Common to All Alternatives**

Management for lands and realty, livestock grazing and range improvements, transportation and access, vegetation, and fire and fuels may result in direct adverse impacts on recreational opportunities and experiences. Development and management of these resources and resource uses may create health and safety concerns for the recreational user, such as noise, dust, and vehicle conflicts; adverse effects on recreational experiences through damage to recreational settings and perceptions of naturalness; and reduced or restricted access to recreation areas. Changes to the landscape that can be seen from popular recreation sites, trails, or auto-touring drives (for example, Highway 12) could affect the recreational setting and the potential to realize certain recreational experiences.

Management of special designations, cultural resources, paleontology, visual resources, fish and wildlife [and special status wildlife species](#), and other resources has the potential to both adversely and beneficially affect recreation. Management to preserve and enhance fish and wildlife habitat is generally supportive of protecting recreational opportunities and experiences through preservation of the natural setting and maintenance of healthy wildlife populations for hunting and wildlife viewing. Conversely, fish and wildlife management can restrict the season of use or recreational opportunities available at a given location, such as restricting seasonal access to big game seasonal habitats, limiting OHV access, and closing climbing routes on cliffs with nesting raptors. Similar to fish and wildlife management, measures to protect soil and water and visual resources, as well as creating special designations, can be both adverse and beneficial to recreational opportunities and experiences. Where these measures limit changes to the natural setting, they can benefit primitive recreation experiences where such settings are important. For example, WSAs are managed and maintained to provide for unique recreational opportunities in a primitive setting by limiting development. Designating SRMAs and RMZs, and, to a lesser extent, ERMAs, would have long-term beneficial effects on the management and protection of specific recreational opportunities and experiences. SRMAs and RMZs set distinct recreation management strategies for identified values and characteristics at discrete locations, resulting in beneficial impacts on recreational use. Recreation planning across BLM-managed surface lands has shifted to an outcomes-focused management framework. Each SRMA and RMZ has specific measurable outcomes, focused objectives, and associated management actions that provide a beneficial impact by guiding the amounts and types of uses allowed. ERMA management is commensurate and considered in context with the management of other resources and resource uses. RMZs, which can be included as discrete units within a SRMA or ERMA, have a distinctive recreation character, provide opportunities for a different experience and benefit outcome, and require a different set of management actions.

The RMA frameworks have been developed for each SRMA, ERMA, and RMZ (**Appendix E**, Recreation Management Areas). These frameworks identify the key elements of the proposed RMAs, including targeted recreation activities, experiences, benefits, outcomes, allowable use activities, and management actions associated with each area. Impacts would vary depending on the number and size of the RMAs.

Under all alternatives, the BLM would continue to manage the No Mans Mesa RNA (ACEC) as closed to OHV use, in part because on-the-ground OHV use is not feasible. [All alternatives include direction for the establishment of an OSNHT management corridor and prohibitions on discretionary uses that would not be compatible with nature and purposes of the OSNHT. Due to the recent completion of the OSNHT Inventory, Assessment, and Monitoring Report \(Appendix N\), only Alternative E includes a fully developed management corridor and more specific management direction that could impact recreational uses and is discussed below.](#)

### **Alternative A**

Under Alternative A, the BLM would continue to manage 67,600 acres as six SRMAs and 1,797,700 acres as two ERMAs. The BLM would continue to manage 17,400 acres as 10 RMZs. These RMAs would cover the entirety of GSENM and are depicted in [Figure 2-23, Appendix A](#). These RMAs would be managed in accordance with the RMA frameworks developed in Appendix R, Recreation Management Areas, of the 2020 GSENM Approved RMP and 2020 KEPA Approved RMP. These frameworks identify the key elements of the RMAs, including targeted recreation activities, experiences, benefits, outcomes, allowable use activities, and management actions associated with each area.

Of all alternatives, Alternative A includes the greatest portion of the planning area as ERMAs. Unlike SRMAs, ERMAs do not include specific measurable recreation outcomes and, therefore, their management is generally less prescriptive on allowable recreation activities, experiences, and associated management and allocation decisions. Because they can be less prescriptive, ERMAs can provide greater management flexibility to adapt to changes in recreational use and facility/infrastructure needs. Less specific recreation management under Alternative A would do less to reduce adverse effects from recreation on other resources than would alternatives with fewer acres of ERMAs. In the long term, less specific management could damage recreational settings and result in long-term adverse effects on recreational experiences. However, less specific management could provide additional management flexibility.

Group sizes in certain SRMAs and RMZs would be limited as necessary to be consistent with the management of adjacent NPS units or to protect outstanding opportunities for solitude or primitive and unconfined recreation in certain WSAs, or to protect other resource values like riparian or wildlife resources. Within WSAs, group sizes would be limited to 25 unless otherwise noted in SRMA/RMZ management actions in the 2020 GSENM Approved RMP and 2020 KEPA Approved RMP. This would protect GSENM objects, but would inherently reduce recreational access for larger groups in these areas.

Under Alternative A, recreational shooting would continue to be prohibited within a 0.25-mile buffer around residences, campgrounds, and developed recreation facilities, which includes 8,800 acres ([Figure 2-27, Appendix A](#)). The buffer distance corresponds with the State of Utah code (Section 76-10-508) and may be increased depending on area-specific conditions. These restrictions would protect human health and safety as well as property. These restrictions would not pertain to the lawful pursuit of game. Opportunities for recreational shooting would continue throughout the rest of GSENM (1,856,800 acres). This would continue to result in the potential displacement of recreationists seeking opportunities for hiking, camping, sightseeing, and other activities due to noise and public safety risks associated with recreational shooting. This could also continue to result in conflicts with other recreational users in GSENM. Alternative A would benefit the recreational shooting sports community the most of all alternatives because it would manage the most area as available to recreational shooting.

Under Alternative A, the BLM would continue to manage 1,500 acres as closed to OHV travel in No Mans Mesa RNA (ACEC), which would prevent opportunities for motorized recreation in this area. Cross-country OHV travel would continue to be allowed in 100 acres in the Little Desert RMZ. Of all alternatives, this would provide the greatest benefits for users seeking OHV opportunities because it would provide unique cross-country OHV opportunities in OHV open areas. This could reduce unauthorized off-trail travel in areas where OHV use is limited or closed. This would also continue to result in damage to paleontological and cultural resources that could be considered inconsistent with the protection of GSENM's objects. OHV travel on designated routes would continue to be allowed on the

remaining 1,864,000 acres in GSENM (Figure 2-32, Appendix A). Alternative A would provide the greatest recreational access of all alternatives because it includes one OHV open area and the fewest acres of OHV closed areas. ATV and newer UTV recreation in some areas is expected to continue to involve resource and road damage and user conflicts. Because Alternative A would not close any designated routes, and would provide the most acres available for OHV use (limited to designated routes), this would reduce conflicts between motorized recreationists.

Pedestrian use would continue to be allowed throughout GSENM under Alternative A. Opportunities for pedestrian uses in GSENM would therefore continue to be widespread, though experiences would continue to be affected by conflicting recreational uses, such as OHV travel and recreational shooting. There would continue to be a need for GSENM management to consider designating additional trails for mountain bike and/or e-bike use. Nonmotorized and nonmechanized cross-country competitive events would continue to be prohibited, which would protect resources and would continue to allow nonmotorized/mechanized competitive events only along designated routes.

Under Alternative A, the BLM would create campgrounds or designated dispersed camping areas to support management goals and objectives for other resources. Camping would continue to be prohibited in alcoves, adjacent to rock writing sites, and within historic or prehistoric sites listed or eligible for listing on the NRHP. Additional camping restrictions may be included on SRPs to reduce or eliminate impacts on archaeological sites. Camping would continue to be allowed adjacent to range facilities and isolated water sources unless otherwise posted. Considered collectively, these actions would protect resources from potential impacts from camping but would reduce camping opportunities across GSENM. Dispersed vehicle camping would be allowed only in previously disturbed areas along designated routes in SRMAs and RMZs. This would limit potential resource impacts resulting from dispersed camping but would reduce overall dispersed camping opportunities across GSENM. Campfires would continue to not be allowed in Escalante and Paria/Hackberry Canyons, No Mans Mesa, and other relict plant areas as identified, or in archaeological and historic sites, rock shelters, or alcoves. This would protect resources from potential impacts from campfires in these areas but could reduce the quality of camping experiences in these areas. The BLM would continue to require the use of disposable, self-contained human waste management systems within 300 feet of a water source to protect resources.

Issuances of SRPs would continue to be discretionary actions. SRP holders would be prohibited from camping within 200 feet of riparian areas, unless site-specific analysis demonstrates that there would be no impacts on riparian vegetation or proper functioning condition. This would protect riparian resources within GSENM, but limit camping opportunities for SRP holders.

While the 2020 Approved RMPs do not expressly speak to recreational facilities, under Alternative A there would continue to be few restrictions outside of VSAs on where development could occur. In general, the establishment of additional recreational infrastructure would enhance certain types of recreational opportunities and provide for improved public health and safety.

### **Alternative B**

Under Alternative B, the BLM would manage 95,300 acres as six SRMAs. This is greater than but similar to the acreage managed as SRMAs under Alternative A; therefore, impacts on recreation related to SRMA management would be similar to those described under Alternative A. The BLM would manage 1,770,100 acres as eight ERMAs. This is slightly fewer than but similar to the acreage managed as ERMAs under

Alternative A; therefore, impacts on recreation related to ERMA management would be similar to those described under Alternative A. The BLM would manage 3,300 acres as three RMZs. Similar to Alternative A, these RMAs would cover the entirety of GSENM. Overall, impacts on recreation from designation of RMAs under Alternative B would be similar to Alternative A, with slightly different recreation decisions associated with the different SRMA/ERMA/RMZ designations.

Group sizes would be limited in accordance with RMA prescriptions in Appendix E. Within WSAs, group sizes would be limited to 25 unless further restricted in SRMA/RMZ management actions. This would protect objects but would inherently limit recreational access for larger groups in these areas. Impacts on recreation from limiting group sizes would be similar to those described under Alternative A.

Under Alternative B, recreational shooting would be prohibited across 914,100 acres, which includes WSAs, RNAs (ACECs), and a 0.25-mile buffer around residences, as well as prohibited from, on, or across routes, campgrounds, developed recreation sites and trails, and designated camping areas. These restrictions would protect human health and safety as well as property. Additionally, these restrictions would provide protections to WSAs consistent with BLM Manual 6330 – Management of BLM Wilderness Study Areas as well as FLPMA Section 202 which allows the BLM to include decisions in land use plans that may limit or exclude one or more of the major uses of BLM lands. Finally, these restrictions would also be consistent with 43 CFR 8223 which allows special management for the protection and purposes of RNAs (ACECs). These restrictions would not pertain to the lawful pursuit of game. This would reduce the displacement of and potential for conflicts with other recreational users in GSENM compared with Alternative A; however, these conflicts could still exist where recreational shooting is allowed. Alternative B would limit access for recreational shooting compared with Alternative A because it would make unavailable more acreage to recreational shooting.

Under Alternative B, the BLM would manage 952,000 acres as closed to OHV travel in WSAs and ISAs, lands with wilderness characteristics identified for protection within WSAs, and No Mans Mesa RNA (ACEC), which would prevent new routes from being designated in these areas, limiting opportunities for motorized recreation primarily in areas where those opportunities have not existed. This management direction is consistent with the Wilderness Act and FLPMA. This would not close any designated routes (Figure 2-33, Appendix A). Within these areas closed to OHV travel, impacts on GSENM objects would likely be reduced.

Under Alternative B, the ability to recreate away from motorized routes would be greater than under Alternative A. OHV travel on designated routes would continue to be allowed on the remaining 913,600 acres in GSENM (Figure 2-33, Appendix A). This would limit resource damage from cross-country OHV travel compared with Alternative A, and yield minimal beneficial effects on natural settings and primitive recreation experiences compared with Alternative A. Alternative B would eliminate access for cross-country OHV recreation on 100 acres when compared with Alternative A. This could result in unauthorized cross-country OHV travel occurring in the previously 100 acres OHV-open area under Alternative A, eliminating the OHV-open area near the town of Escalante, and would likely displace users of the OHV-open area, resulting in unauthorized cross-country travel. Alternative B manages more acres of OHV closed than Alternative A, limiting areas where future travel management planning could designate routes for OHV use.



Pedestrian use would continue to be allowed throughout GSENM under Alternative B. Opportunities for pedestrian uses in GSENM would therefore continue to be widespread, though experiences would continue to be affected (although to a lesser extent than under Alternative A) by conflicting recreational uses, such as recreational shooting. GSENM management would consider designating additional trails for mountain bike and/or e-bike use in future implementation level planning. Nonmotorized competitive events on designated routes may be considered by the authorizing officer in accordance with RMA prescriptions, while motorized competitive events would be prohibited. This would further restrict nonmotorized competitive events, and completely restrict these mechanized competitive events compared to Alternative A. Recreational stock would be limited in accordance with RMA prescriptions, which would limit this type of recreational use compared to Alternative A.

Camping and campfire prescriptions would be allowed in accordance with RMA prescriptions. Sensitive resource areas may be closed to camping consistent with the protection of GSENM objects. Considered collectively, these actions would protect resources from potential impacts from camping but would reduce camping opportunities across GSENM. The BLM would require the use of disposable, self-contained human waste management systems within 300 feet of a water source to protect resources unless facilities are provided. This management would be extended to within certain RMAs in accordance with RMA prescriptions, or based on monitoring visitor use levels and resource impacts. This would require greater preparation of visitors compared to Alternative A.

Multiyear SRPs would be subject to annual review. Motorized and nonmotorized SRPs on designated routes may be considered by the authorizing officer in accordance with RMA prescriptions. The BLM may require the public to obtain permits to engage in noncommercial recreational use, and impose limitations on the number of commercial and noncommercial permits issued for a given area over a certain time period. Considered collectively, these management directions would enable the BLM to better protect GSENM objects, but would inherently limit SRPs and certain recreational activities to a greater extent than under Alternative A.

Under Alternative B, the BLM may require the public to obtain permits to engage in non-commercial recreational use, and/or impose limitations on the number of commercial and non-commercial permits issued for a given area over a certain time period based on certain indicators. The issuance and limiting of permits would inherently reduce recreational access compared to Alternative A.

The BLM would provide signage as needed for safety, resource protection, identification, orientation, and interpretive/educational purposes. This would improve the quality of recreational opportunities compared to Alternative A.

Permanent fixed climbing anchors outside of WSAs could be permitted if shown to be consistent with the protection of GSENM objects and if they would enhance public safety. Canyoneering, rappelling, and climbing would not be allowed in paleontological and archaeological sites, natural bridges, arches, and flow or active waterfalls or special status species' habitat. Additionally, other areas may be buffered or seasonally closed to canyoneering, rappelling or climbing to prevent disturbance to raptor nesting. These actions considered collectively would reduce climbing access within GSENM, but likely improve public safety and protect GSENM objects.

To provide for public health and safety, recreational facilities such as campgrounds and [restrooms](#) would be allowed at some locations in accordance with RMA prescriptions. As described under Alternative A, the establishment of additional recreational infrastructure would generally enhance recreational opportunities and provide for improved visitor health and safety.

Under Alternative B, the Cottonwood pasture of the Deer Creek allotment, the Phipps pasture in the Phipps allotment, McGrath Point, and Saltwater Creek would [continue to](#) be unavailable to grazing to reduce grazing and recreation conflicts. These pastures/allotments were first made unavailable through a 1999 amendment to the Escalante Management Framework Plan (BLM 1999). In addition to the allotments made unavailable under Alternative A, this reduction in available allotments would further reduce livestock/recreation interactions in areas previously identified as having potential conflicts.

### **Alternative C**

Under Alternative C, the BLM would establish four management areas, under which [36,600](#) acres would be managed as front country, [53,000](#) acres would be managed as a passage area, [654,100](#) acres would be managed as an outback area, and [1,121,700](#) acres would be managed as a primitive area. These areas would be used to identify the allowable uses that meet the goals and objectives of the area while also protecting GSENM objects. The majority of GSENM would be managed as a primitive area, which would benefit natural and biological uses and recreation users seeking solitude and primitive opportunities to a greater extent than would the other alternatives.

In addition to management areas, 14 SRMAs would be designated to provide for specific outcomes-based recreational experiences [and desired recreation setting characteristics](#). Eight ERMAs would also be designated to facilitate specific recreational outcomes while ensuring resource protection. These RMAs would not cover all lands within GSENM, which would leave some areas without any [RMA-specific](#) recreation prescriptions (**Figure 2-18, Appendix A**). [However, the management direction for management areas \(front country, passage, outback, and primitive\) do provide detailed direction for many of the same recreation uses](#). Alternative C includes the greatest designation of SRMAs of all alternatives and, therefore, would provide the most prescriptive management of allowable recreation activities and experiences of all alternatives.

[Under Alternative C, group sizes would be limited to the following in management areas: 75 individuals in the front country area, 25 individuals in the passage area, 25 individuals in the outback area, and 12 individuals in the primitive area. Group sizes in SRMAs would supersede management area group size limits. Exceptions to group size limits could be considered for SRPs on a case-by-case basis. Overall, this would protect objects and resource values but would inherently limit recreational access for larger groups in these areas compared to Alternatives A and B.](#)

Under Alternative C, recreational [shooting](#) would be prohibited in the front country and primitive areas. In the passage and outback areas, [recreational shooting](#) would be prohibited within 0.25 miles of residences, campgrounds, and developed recreation sites and trails and from, on, or across routes. Overall, recreational [shooting](#) would be prohibited across [1,168,000](#) acres. These restrictions would protect human health and safety while also protecting the lands and resources that make up the primitive area. Because the primitive area is largely comprised of WSAs, the prohibition of recreational [shooting](#) would protect the wilderness character of these areas by reducing impacts such as avoidance and disturbances to wildlife, [impacts on](#) soil and vegetation resources from human disturbance, and reducing

noise that diminishes the natural soundscape of GSENM. These restrictions would not pertain to the lawful pursuit of game. This would reduce the potential for displacement of and conflicts with other recreational users in GSENM compared with Alternative A; however, these conflicts could still exist across the 697,600 acres where recreational shooting would be allowed. Alternative C would adversely impact the recreational shooting sports community to a larger extent than under Alternatives A and B because it would make unavailable more acreage to recreational shooting.

Under Alternative C, the BLM would manage 1,209,500 acres as closed to OHV travel across the No Mans Mesa RNA (ACEC), WSAs and ISAs, some lands with wilderness characteristics, and the primitive area, which would prevent opportunities for motorized recreation in these areas. Because the majority of the primitive area is made up of WSAs, ISAs, and LWC managed to protect, this management direction is consistent with the Wilderness Act and FLMPA. Additional lands closed to OHV travel under Alternative C would reduce impacts on GSENM objects. This would limit the ability of the BLM to designate new motorized routes during future implementation level TMP planning in OHV closed areas. This would effectively close one route, known as the V-Road (Figure 2-34, Appendix A). The V-Road is approximately 7 miles in length and would be closed because it falls within a OHV closed area. OHV travel on designated routes would continue to be allowed on the remaining 656,100 acres in GSENM (Figure 2-34, Appendix A). This would limit resource damage from cross-country OHV travel, yield beneficial effects on natural settings and primitive recreation experiences, provide a greater ability to recreate away from motorized routes, and limit access for cross-country OHV recreation, as well as access for nonmotorized routes in certain areas across GSENM, similar to Alternative B.

Pedestrian use would continue to be allowed throughout GSENM under Alternative C. Opportunities for pedestrian uses in GSENM would therefore continue to be widespread, though experiences would continue to be affected (although to a lesser extent than under Alternative A) by conflicting recreational uses, such as recreational shooting. GSENM management would consider designating additional trails for mountain bike and/or e-bike use in future implementation level planning. Under Alternative C, opportunities for competitive events in front country, passage, and outback areas would be the same as described under Alternative B, while competitive events would be prohibited in primitive areas. This would reduce opportunities for all competitive events compared to Alternatives A and B. Recreational stock would be limited to 25 animals in the front country area, 25 animals in the passage and outback areas, and 12 animals in primitive areas, unless otherwise specified for RMAs. This would limit recreational stock use compared to Alternatives A and B.

Similar to Alternative B, camping would be allowed in accordance with RMA prescriptions, and sensitive areas outside of RMAs could be closed to camping. Alternative C includes additional camping prescriptions in management areas (front country, passage, outback and primitive). These would effectively limit camping opportunities overall compared to Alternatives A and B, but would provide camping opportunities while enabling the BLM to better protect GSENM objects. Campfires would be restricted in the front country area, passage area, outback area, and primitive area, and prohibited in sensitive resource areas. This would limit opportunities for campfires to a greater extent than under Alternatives A and B. Impacts from the management of the use of personal waste systems would be the same as described under Alternative B.

SRPs would be issued for noncompetitive motorized events with restrictions on vehicle group sizes in all management areas. SRPs that provide for intentional visitation to most cultural sites would be prohibited in the outback and primitive areas. SRPs would be prohibited for noncompetitive motorized SRP events

in the primitive area, and the number would be limited to ensure an undeveloped, primitive, and self-directed visitor experience is achieved. This would overall improve the opportunities to be managed for in each management area, but would limit SRPs in management areas compared to Alternatives A and B. Impacts on limiting recreational access from the issuance and limiting of commercial and non-commercial permits would be the same as described under Alternative B.

Impacts on recreation from the addition of signage would be the same as described under Alternative B.

Under Alternative C, new fixed climbing anchors would be the same as Alternative B. Permanent fixed climbing anchors outside of WSAs could be permitted if shown to be consistent with the protection of GSENM objects and if they would enhance public safety. Canyoneering, rappelling, and climbing restrictions would be the same as described under Alternative B.

To provide for future recreational needs, management areas would identify areas in which future recreational facilities could be developed. In general, the front country would allow for facilities to accommodate larger groups while facilities would be nonexistent in the primitive area. As described under Alternative A, the establishment of additional recreational infrastructure would generally enhance recreational opportunities and provide for improved visitor health and safety.

Under Alternative C, no additional allotments or pastures would be made unavailable. It would be the same as identified above under Alternative B (229,800 acres unavailable).

#### **Alternative D**

Under Alternative D, the BLM would manage 100,300 acres as 9 SRMAs and 311,900 acres as 5 ERMAs. These RMAs would not cover all lands within GSENM. Alternative C would yield greater long-term beneficial effects on the management and protection of specific recreational opportunities and experiences in SRMAs compared with Alternative A. However, since Alternative D would designate the fewest acres within RMAs of all alternatives, this would limit the BLM's ability to manage for specific recreation values and characteristics across the GSENM, which would ultimately limit beneficial impacts on recreational use compared with the other alternatives.

Under Alternative D, recreational shooting would be prohibited across the entire GSENM (Approximately 1,865,600 acres). These restrictions would not pertain to the lawful pursuit of game. This would reduce the displacement of and potential for conflicts with other recreational users in GSENM compared with all other alternatives, but also eliminate access for all recreational shooting. This could lead to instances of unauthorized recreational shooting in GSENM. Prohibiting recreational shooting throughout GSENM would protect resources such as natural soundscapes, reduce avoidance and disturbances to wildlife, and reduce impacts on soil and vegetation resources from human disturbance. Vestiges of recreational shooting such as spent cartridges and clay pigeons could also impact soils and vegetation. Under Alternative D, the BLM would manage 1,438,000 acres as closed to OHV travel, which is the most of any alternative. This closure would protect objects from OHV use across the majority of GSENM. This would protect areas where comprehensive surveys (for example, cultural, paleontological, and special status plant and animal habitats) have yet to be conducted. This would limit the ability of the BLM to designate new motorized routes during future implementation level TMP planning in OHV closed areas. This would effectively close 7 miles of designated routes to passenger vehicle use compared with Alternative A (Figure 2-35, Appendix A). Recreational access would be limited to 427,600 acres on designated roads.

This would limit resource damage from cross-country OHV travel, provide the greatest ability to recreate away from motorized routes, and yield beneficial effects on natural settings and primitive recreation experiences similar to Alternatives B and C in areas closed to OHV travel. Alternative D would also reduce access for motorized users, as well as access to nonmotorized routes in certain areas, the most of all alternatives due to it managing the most acreage as OHV closed.

Pedestrian use would continue to be allowed throughout GSENM under Alternative D. Opportunities for pedestrian uses in GSENM would therefore continue to be widespread. GSENM management would consider additional trails designated for mountain bike and/or e-bike use in future implementation level planning. All competitive events would be prohibited in GSENM, which would eliminate these opportunities compared to all other alternatives. Recreational stock would be limited in accordance with RMA prescriptions, and to 12 animals outside of RMAs. This would limit this type of recreational use to the greatest extent of all alternatives.

Camping would be allowed in accordance with RMA prescriptions. Camping would be allowed in areas outside of RMAs; however, sensitive resource areas may be closed to camping. This would result in similar impacts on camping opportunities as described under Alternative B. Campfires would be restricted across GSENM similar to restrictions in the Front Country Area under Alternative C. These restrictions include that campfires would not be allowed outside of designated fire grate, campfire wood collecting would not be allowed, and removal of unused imported firewood would be required. Alternative D includes the most restrictions on campfires of all alternatives. Under Alternative D, visitors would be required to use personal waste systems unless facilities are provided in all areas of GSENM. This would require greater preparation amongst visitors compared to all other alternatives.

Nonmotorized SRPs would be allowed but would be limited to protect cultural sites and wilderness characteristics. This would reduce SRPs the most of all alternatives. Group sizes in RMAs would be limited in accordance with RMA prescriptions and limited to 25 individuals in areas outside of RMAs. This would restrict group sizes to the greatest extent of all alternatives. Impacts on limiting recreational access from the issuance and limiting of commercial and non-commercial permits would be the same as described under Alternatives B and C.

Impacts on recreation from the addition of signage would be the same as described under Alternatives B and C.

New fixed climbing anchors in GSENM would be prohibited under Alternative D. This would limit future climbing opportunities in GSENM to the greatest extent of all alternatives.

To provide for future recreational needs, recreational facilities would be allowed in accordance with RMA prescriptions. As described under Alternative A, the establishment of additional recreational infrastructure would generally enhance recreational opportunities and provide for improved visitor health and safety. However, land use allocations would be the most limited under Alternative D of all alternatives and would curtail discretionary actions including recreation and activities under SRPs.

### **Alternative E**

Under Alternative E, impacts on recreation and visitor services resulting from SRMA, ERMA, and management area designations and OHV allocations would be similar as described under Alternative C.

Under Alternative E, recreational shooting would be prohibited within 600 feet of locations with archaeological and historical resources, in the front country area, and within 600 feet of residences, campgrounds, and developed recreation facilities in the passage, outback, and primitive zones. Including within 600 feet of the following routes: The Hole-in-the-Rock Road, the Burr Trail Road, the Smokey Mountain Road, the Cottonwood Wash Road, the Skutumpah Road, the House Rock Valley Road and the Johnson Canyon Road. Overall, recreational shooting would be prohibited across 163,000 acres. This would result in similar benefits to non-shooting recreational uses as described under the other action alternatives, but to a lesser extent since Alternative E prohibits recreational shooting across the fewest acres of all action alternatives. Conversely, Alternative E would adversely impact the recreational shooting sports community to a lesser extent than under the other action alternatives because of the reduced closed recreational shooting.

Under Alternative E, impacts on recreation and visitor services resulting from OHV area allocations would be similar to those described under Alternative C. Closed to OHV travel would be approximately 1,245,700 acres under Alternative E (**Figure 2-36, Appendix A**), and slightly less under Alternative C at 1,209,500 acres. Similarly, OHV travel limited to designated routes would be 656,100 acres under alternative C and 619,900 under alternative E. This means less designated routes under Alternative E which would have less overall impacts than Alternative A, B, and C. Alternative D would have less limited to designated routes than Alternative E.

Impacts on SRPs, competitive and noncompetitive events, group sizes, canyoneering, rappelling, climbing, issuance and limitation of commercial and non-commercial permits, recreational stock, and signage would be the same as described under Alternative C. Impacts on camping in the Front Country, Passage, Outback and Primitive areas would be the same as described under Alternative C; however, Alternative E would place further restrictions in camping in all areas by implementing stay limits, quiet hours, and prohibitions on camping within sensitive cultural and natural resources. This would limit camping opportunities to a greater extent than Alternative C. Under Alternative E, the BLM would require the use of personal waste systems within 330 feet of a water source unless facilities are provided, and in other areas identified based on monitoring visitation use levels and resource impacts. This would require greater preparation amongst visitors, similar to but to a slightly greater extent compared to Alternatives A, B, and C.

Under Alternative E, the OSNHT Management Corridor would be designated (**Figure 3-22, Appendix A**), which would include portions of the Buckskin-Five Mile ERMA, Cottonwood Canyon Road SRMA, Paria-Hackberry Canyons SRMA, Old Paria SRMA, and Toadstools SRMA. Management direction for the OSNHT Management Corridor that would improve and facilitate recreational facilities include providing appropriate facilities, interpretation, signage (see **Appendix N** for recommendations), and the development of an Activity Plan to specific appropriate uses within the OSNHT Management Corridor. Additionally, recreation within the Paria River and Paria Breaks OSNHT inventory analysis units to emphasize high-quality recreation opportunities and exceptions to group size limits may be authorized within the corridor to prevent other management area prescriptions from over-riding the goals and objectives of NHT management. ROW avoidance and exclusion and VRM Class I management outside of Congressionally designated utility corridors and VRM management would also serve to protect the

recreational opportunities and experiences within the OSNHT Management Corridor under Alternative E.

### **Cumulative Impacts**

The cumulative impacts analysis area for recreation is the planning area and surrounding public lands accessible to recreation users. The area includes recreation areas that could be directly affected by management decisions and surrounding lands that could also experience recreation impacts due to management decisions in the planning area. Cumulative impacts may result from activities in adjacent communities, recreation and visitation to nearby public lands, and resource-use activities. Past, present, and reasonably foreseeable recreation projects in the analysis area could contribute to cumulative impacts. These projects include deferred maintenance and improvements of the Calf Creek Recreation Area Site, various and SRPs, and Kanab Field Office projects (**Appendix F**, Analytical Framework). In general, these projects would contribute to beneficial cumulative impacts by improving recreation facilities and concentrating recreation to developed areas (Monz 2021; Marion et al. 2020). If recreation demands continue to increase across the state of Utah in general and in the “Mighty Five” national parks in southern Utah near GSENM in particular, visitors seeking small-group, primitive, and unconfined recreational experiences may choose to visit GSENM. All alternatives include SRMAs and/or RMZs that identify where the BLM would generally prioritize the expenditure of funding and resources for recreation management, though the size of these RMAs varies by alternative. Alternatives A and B, which provide less prescriptive ERMA management on the majority of the planning area, may also provide additional management flexibility to adapt to future changes in recreation use and needs and address resource conflicts associated with increasing recreation through the development of new recreation facilities and infrastructure. Alternatives C, D, and E would provide more prescriptive SRMA management across the decision area, which may attract certain recreationists to GSENM due to the emphasis of certain uses.

## **3.18 TRAVEL MANAGEMENT**

### **3.18.1 Affected Environment**

#### **Current Conditions**

Current transportation and access routes into and through the decision area consist of federal and state highways, BLM roads, primitive roads and trails, county road systems, and ROW access roads. The transportation system encompasses approximately 921 miles of designated routes within GSENM. This includes two paved highways that provide access to GSENM: U.S. Highway 89 on the south and State Route 12 (also referred to as Highway 12) on the north.

All OHV (refers to all public motorized vehicles, including dirt motorcycles, passenger vehicles, dune buggies, jeeps, four-wheel drive vehicles, sport utility vehicles, over-the-snow vehicles, UTVs and ATVs, helicopters and motorized aircraft [when on or immediately over land], and drones, as defined in 43 CFR 8340.0-5[a]), and mechanized [such as bicycles]) travel within the decision area is limited to routes designated for those purposes. OHV use on BLM-managed lands provides access, experience, and connectivity, as outlined in BLM Manual MS-1626. Existing travel designations in the planning area are detailed in the 2020 Approved RMPs (BLM 2020a, b). Mechanized travel is allowed on trails designated for that use as well as on routes and areas designated for OHV use, unless specifically prohibited. Most of

the state- and county-maintained roads have either an existing BLM-issued ROW or are claimed as Revised Statute 2477<sup>17</sup> roads by the counties.

The GSENM 2020 ROD amended the GSENM Travel Management Plan (BLM 2000) to include the V-Road and Inchworm Arch Road as open to and available for OHV use. These routes are currently used by local residents and tourists to access certain archaeological and geological sites in GSENM. Please refer to the GSENM 2020 ROD for more information regarding the designation of these two routes (BLM 2020a).

In addition to arterial and collector routes, there are numerous tertiary routes that connect more remote locations to the larger roads. These routes are used for recreational purposes, access to range improvements, and access to inholdings not managed by the BLM. Additionally, routes are known to exist and receive public use that are not included in the 921 miles of designated routes available for public use.

Many of these existing routes are claimed as Revised Statute 2477 roads by the State of Utah and Kane County or Garfield County. Within the planning area there are approximately 1,654 miles of routes claimed under Revised Statute 2477, of those routes' 709 miles are included in the 921 miles of designated routes available for public use and 944 miles are not designated for public use. Existing routes claimed under Revised Statute 2477 and their BLM route status is shown in **Figure 3-40, Appendix A**.

The decision area includes a few abandoned backcountry airstrips on BLM-managed land. Some of these are within WSAs. The New Home Bench airstrip near Boulder, Utah, is the only maintained airstrip identified in the 2000 MMP (BLM 2000).

Subsequent transportation management planning (TMP) following the development of the RMP could consider and analyze additional routes, trails, and airstrips for inclusion in the TMP within areas designated as OHV limited. Under all action alternatives, the TMP would protect GSENM objects and consider opportunities for motorized and nonmotorized/nonmechanized trails.

Within the planning area, there are currently 35 developed trailheads; however, the 3-mile Lower Calf Creek Falls Trail is the only designated trail in GSENM. Pedestrian trails are the primary means of nonmotorized and nonmechanized travel.

There are several scenic drives in GSENM. These are addressed in **Section 3.20.3, Scenic Routes**.

---

<sup>17</sup> The State of Utah and its counties may hold valid existing ROWs in the Planning Area pursuant to Revised Statute 2477 (R.S. 2477), Act of July 28, 1866, Chapter 262, 8,14; Stat. 252, 253, codified at 43 USC 932. Congress repealed R. S. 2477 through passage of FLPMA. R. S. 2477 rights are determined through a process that is entirely independent of the BLM's land use planning process. This planning effort is not intended to provide any evidence bearing on or addressing the validity of any R. S. 2477 assertions and does not adjudicate, analyze, or otherwise determine the validity of claimed ROWs. Nothing in this BLM RMP is intended to extinguish any valid existing ROW or alter in any way the legal rights the state and counties may have to assert and protect R. S. 2477 rights.



### 3.18.2 Environmental Consequences

Refer to **Section F.23**, Travel Management, in **Appendix F**, Analytical Framework, for descriptions of the indicators, analysis areas, and assumptions used for the following analysis.

#### Issue

- How would proposed management affect the travel and transportation system in GSENM?

#### Impacts Common to All Alternatives

Management for lands and realty, fish and wildlife and special status wildlife species, special designations, and recreation may result in impacts on travel and transportation management. For example, management that limits or restricts access based on the values of protecting and enhancing habitat, special status species, or other resources would have an adverse impact on transportation. New roads built as part of ROWs, for example, could increase access if they are integrated in the transportation system for public use. Certain designations of BLM-managed surface land can restrict travel that adversely affects transportation and access, including RMAs; ACECs, WSAs, and other special designations, as well as management of lands with wilderness characteristics to preserve their wilderness characteristics.

#### Delineation of Travel Management Areas

Travel management areas (TMAs) are a planning tool for delineating a sub-unit of the decision area where unique travel management circumstances result in the need for particular focus and additional analysis. Alternatives A would delineate the decision area into the following TMAs:

- Garfield County
  - Hole-in-the-Rock Road
  - Circle Cliffs
- Kane County
- Kaiparowits
- Escalante Canyons
- Grand Staircase

Alternatives B, C, D, and E would only divide GSENM into three TMAs: Kaiparowits, Escalante Canyons, and Grand Staircase (Figure 2-42, Appendix A). While the travel management area delineations cover the entire decision area for Alternatives B, C, D, and E, adjustments to TMA boundaries may be made prior to conducting travel management planning.

Route designations are typically implementation-level decisions that would be analyzed and approved in accordance with 43 CFR 8342.1 through a travel management planning process, but can also be done outside of a travel planning process, so long as the route is analyzed in accordance with the previously cited regulation and approved through an agency decision. This process evaluates and designates routes as either OHV-open, OHV-limited, or OHV-closed to provide a high-quality travel network for a wide variety of uses. Resulting in a travel management plan that provides a process for determining a comprehensive and maintainable route network while meeting resource management needs and protecting GSENM objects. Examples of beneficial impacts of designating routes through a TMP include improved access, experience, and connectivity; the promotion of safety for all users; boundary signage and minimization of conflict among various uses of BLM-managed lands; and reduction in route redundancy,

resource degradation, and habitat fragmentation in the planning area. TMPs may also provide an opportunity for coordinating transportation planning with Kane and Garfield Counties or adjacent communities. Such coordination could reduce access issues and management conflicts, improve the safety and convenience of the traveling public, and provide a more sustainable use of resources.

Unlike implementation-level travel planning, closure of an OHV designated route could be the inherent outcome of a planning-level decision, like designating OHV areas as closed to OHVs. If designated routes are within areas designated as OHV Closed, they would be considered closed once the Land Use Plan or Resource Management plan was approved through a record of decision.

#### *Impacts from Changes to the GSENM Route Network*

Alternatives A, B, C, and E do not propose any implementation-level decisions that would modify the existing GSENM TMP as part of this land use planning effort. Alternative D would amend the current GSENM TMP by issuing a decision to close the Inchworm Arch Road to OHV use. This route is currently used by local residents and tourists to access a geological site, known as the Inchworm Arch, which is identified in Proclamation 10286 as a GSENM object. Closing this route would adversely affect recreation users by removing legal access to the Inchworm Arch. Because Alternatives A, B, C, and E would not close this route, continued OHV use of this open route could result in impacts on cultural and paleontological resources, nonmotorized recreation and travel, soil and water resources, wildlife, and other resources and uses. **Appendix G**, Inchworm Arch Road Interdisciplinary Route Evaluation Form and Analysis, provides detailed site-specific analysis in accordance with 43 CFR 8342.1 and analyzes the impacts associated with potential closure of the Inchworm Arch Road.

#### *Impacts from OHV Area Designations*

All BLM-managed lands are required to have OHV area designations (43 CFR part 1600 and 8342.1). Areas must be designated as open, limited, or closed to OHV travel; this is a planning-level decision. Open areas allow all types of vehicle use year-long anywhere within an open area. Open designations are used for intensive OHV use areas where there are no special restrictions or where there are no compelling resource protection needs, user conflicts, or public safety issues to warrant limiting cross-country travel. Limited areas restrict vehicle use within specified areas and/or on designated routes, roads, vehicle ways, or trails subject to restrictions. The limited designation is used where OHV use must be restricted to meet specific resource management objectives. These restrictions may be of any type but are generally within the following categories or combination of categories: number of vehicles, types of vehicles, time or season of vehicle use, authorized or permitted use only, use on existing routes and trails, use on designated routes and trails, and other restrictions. While the designation of an area to the OHV limited allocation is a land use planning decision, the specific limitations applicable to the area are considered implementation-level decisions. The standard limitation will be “limited to designated routes.” Closed areas are areas where OHV use is prohibited. Access by means other than motorized vehicle use is permitted. Areas are designated closed if closure to all vehicular use is necessary to protect resources, promote visitor safety, or reduce user conflicts. The BLM Authorized Officer may expressly authorize motorized use in closed areas for administrative and permitted use, because such use is expressly authorized and exempt from the OHV regulations per 43 CFR 8340. The criteria used to make the area designations are based on the management prescriptions described in the alternatives.

Any land acquired by the BLM over the life of the RMP will be managed similarly to the existing OHV area designations of adjoining BLM-managed lands or as stated, or implied, in the acquisition. Where

clarification is absent, the BLM will manage acquired lands under the OHV limited area designation. The type of limitation will be set by implementation-level decisions; until these decisions are made, use may continue in the same manner and degree consistent with the purposes for which the acquisition was made.

Alternatives A and B do not propose any planning-level decisions that would modify the current GSENM TMP as part of this land use planning effort. Alternatives C, D, and E would modify the current GSENM TMP as a part of this land use planning effort by designating the area where the V-Road is located as OHV Closed. Closing this route would adversely affect recreation users by removing legal motorized access to a popular and widely known geologic formation known by many names, but most commonly is referred to as the “cosmic needle” or “cosmic eye”. Closure of this route would minimize adverse impacts to the adjacent WSA, as V-Road is cherry-stemmed into the WSA. The impacts to the WSA are the result of off-route incursions, unauthorized widening of the route, and user created pullouts and parking areas.

#### **Alternative A**

Under Alternative A, OHV use would continue to be limited to the 921 miles of designated routes across 1,864,000 acres, except in No Mans Mesa RNA (ACEC), where 1,500 acres would be closed to OHV use, and the Little Desert RMA, where 100 acres would continue to be managed as open to cross-country OHV use. Open OHV areas may attract a specific tourism sector; however, the one OHV open area on GSENM is mostly used by local residents. Providing an area for those seeking this type of activity may help avoid instances of cross-country OHV travel in closed or limited areas. Alternative A would yield the greatest benefits to travel, transportation, and access because it would manage the fewest acres of OHV closed areas of the alternatives.

Under Alternative A, travel and transportation would be managed consistent with the current transportation route map (**Figure 2-32, Appendix A**) or as updated through future implementation-level planning. Additionally, as shown in **Figure 2-37, Appendix A**, 1,653 miles of existing and undesignated routes claimed under R.S. 2477 would be within OHV limited areas which limit OHV travel to designated routes and 0 miles of existing and undesignated routes claimed under R.S. 2477 would be within areas closed to OHV travel.<sup>17</sup>

Route improvements or maintenance beyond levels allowed in the 2000 MMP is not described in the 2020 Approved RMPs. This could lead to public safety concerns on certain routes that could benefit from maintenance or improvements. The BLM would allow maintenance of routes according to the travel and transportation management prescriptions within the 2000 MMP this limits maintenance to only basic maintenance except were provided for explicitly.

Management direction for landings and takeoffs of motorized aircraft in GSENM is not described in the 2020 Approved RMPs. Alternative A would yield the greatest benefits to access for motorized aircraft use because it does not restrict motorized aircraft use beyond managing them as OHVs, meaning take off and landings of motorized aircraft are limited to OHV designated routes. However, this could limit the BLM’s ability to protect GSENM objects, compared with Alternatives B, C, D, and E.

#### **Alternative B**

Under Alternative B, OHV use would continue to be limited to the 921 miles of designated routes across 913,600 acres. Under Alternative B, the BLM would manage 952,000 acres as closed to OHV travel in WSAs and ISAs, lands with wilderness characteristics identified for protection within WSAs, and No Mans

Mesa RNA (ACEC), which would prevent opportunities for OHV access in these areas. This designation would not close any routes that are currently designated as open to OHV use. OHV travel on designated routes would continue to be allowed on the remaining 913,600 acres in GSENM (Figure 2-33, Appendix A). This would limit resource damage from cross-country and other OHV travel compared with Alternative A, but would also reduce OHV access for local residents and recreationists compared with Alternative A.

Additionally, as shown in Figure 2-38, Appendix A, 1,446 miles of existing and undesignated routes claimed under R.S. 2477 would be within OHV limited areas which limits OHV travel to designated routes and 208 miles of existing and undesignated routes claimed under R.S. 2477<sup>17</sup> would be within areas closed to OHV travel.

Under Alternative B, routes could be maintained and improved to meet public health and safety needs. Specifically, Hole-in-the-Rock Road, Cottonwood Road, and House Rock Valley Road would be authorized for improvements after site-specific NEPA is completed. This could reduce public safety concerns compared with Alternative A. Under Alternative B, the BLM would consider designating nonmotorized recreational trails in OHV limited and OHV closed areas. This would increase nonmotorized recreational access compared to Alternative A.

Alternative B would clarify motorized aircraft use to include, but not be limited to, fixed-wing aircraft, helicopters, powered paragliders, electric aircraft, and drones. Under Alternative B, public use of GSENM for landings and takeoffs of motorized aircraft would only be allowed on routes designated in a manner that allows such use in a travel management plan. Unless authorized through a formal permitting process, landings and takeoffs of motorized aircraft would be prohibited elsewhere within GSENM, including within 300 feet of developed recreation sites and areas. This would limit access for motorized aircraft compared with Alternative A.

### **Alternative C**

Under Alternative C, OHV use would be limited to the 914 miles of designated routes across 656,100 acres, this is a decrease of 7 miles of designed routes compared to Alternative A. Under Alternative C, the BLM would manage 1,209,500 acres as closed to OHV travel across the No Mans Mesa RNA (ACEC), VSAs and ISAs, lands with wilderness characteristics within the primitive zone, and all other areas in the primitive area, which would prevent opportunities for OHV recreation in these areas. This would effectively close one route known as the V-Road, which consists of 7 miles of designated routes to OHV travel. OHV travel on designated routes would continue to be allowed on the remaining 656,100 acres in GSENM (Figure 2-34, Appendix A). More so than Alternative A and B, this management would limit resource damage from cross-country and other OHV travel. This alternative would also further limit OHV access for local residents and recreationists compared with Alternatives A and B.

Additionally, as shown in Figure 2-39, Appendix A, 1,326 miles of existing and undesignated routes claimed under R.S. 2477 would be within OHV limited areas which limits OHV travel to designated routes and 328 miles of existing and undesignated routes claimed under R.S. 2477 would be within areas closed to OHV travel.<sup>17</sup>

Under Alternative C, routes could be maintained and improved to meet public health and safety needs similar to Alternative B. Under Alternative C, BLM would consider designating nonmotorized recreational

trails in OHV limited and OHV areas within certain parameters for each RMA. This would increase the potential for nonmotorized trail-based recreational access compared to Alternative A, but to a lesser extent compared to Alternative B.

Alternative C would clarify motorized aircraft use similar to Alternative B. Under Alternative C, public motorized aircraft takeoffs and landings could occur in the front country and passage management areas, the same as Alternative B, but would be prohibited in the outback and primitive management areas; they could be authorized on a case-by-case basis through a formal permitting process, where use would be beneficial to protecting GSENM objects. This would result in more impacts on motorized aircraft access compared with Alternatives A and B because it contains the more restrictions than Alternative B.

#### **Alternative D**

Under Alternative D, OHV use would be limited to the 910 miles of designated routes across 427,600 acres, this is a decrease of 11 miles of routes compared to Alternative A. Under Alternative D, the BLM would manage 1,438,000 acres as closed to OHV travel, which is the most of any other alternative. This alternative would close two designated routes: the V-road and the Inchworm Arch Road. Like Alternative C, designation of an OHV closed area that encompasses the entire length of the V-Road, effectively closing 7 miles of route to OHV use. Further, this alternative would also close an additional 4 miles of route, by issuing an implementation-level decision to close the Inchworm Arch Road. OHV access would be limited to designated routes within 427,600 acres in GSENM (**Figure 2-35, Appendix A**). More so than Alternatives A, B, and C, this management would limit resource damage from cross-country and other OHV travel. This alternative would also further limit OHV access for local residents and recreationists compared with Alternatives A, B, and C.

Additionally, as shown in **Figure 2-40, Appendix A**, 1,258 miles of existing and undesignated routes claimed under R.S. 2477 would be within OHV limited areas which limits OHV travel to designated routes and 396 miles of existing and undesignated routes claimed under R.S. 2477<sup>17</sup> would be within areas closed to OHV travel.

Under Alternative D, routes could be maintained and improved to meet public health and safety needs similar to Alternatives B and C. Under Alternative D, the BLM would consider designating nonmotorized trails in OHV limited areas, but prohibit designating new nonmotorized recreational trails in OHV closed areas unless necessary to enhance protection of GSENM objects. This would reduce the potential for nonmotorized trail access compared to the other alternatives. Under Alternative D, impacts on access for motorized aircraft would be the same as those described under Alternative C for the outback and primitive management areas.

#### **Alternative E**

Under Alternative E, OHV use would be limited to the 914 miles of designated routes across 648,500 acres, this is a decrease of 7 miles of designated routes compared to Alternative A. Under Alternative E, the BLM would manage 1,217,100 acres as closed to OHV travel, the same areas would be closed as described under Alternative C, with an increase in acres closed to OHVs, this increase is associated with an increase of acres designated as the primitive area. Route closure under Alternative E, would be the same as Alternative C, effectively closing the V-Road, which consists of 7 miles of designated route, that would no longer be available for OHV use. OHV travel on designated routes would continue to be allowed on the remaining 648,500 acres in GSENM (**Figure 2-36, Appendix A**). More so than Alternative A, B,

and C, this management would limit resource damage from cross-country and other OHV travel, but to a lesser extent than Alternative D. This alternative would also limit OHV access for local residents and recreationists compared with Alternatives A, B, and C, but to a lesser extent than Alternative D.

Additionally, as shown in **Figure 2-41, Appendix A**, 1,313 miles of existing and undesignated routes claimed under R.S. 2477 would be within OHV limited areas which limits OHV travel to designated routes and 341 miles of existing and undesignated routes claimed under R.S. 2477 would be within areas closed to OHV travel.

Under Alternative E, routes could be maintained and improved to meet public health and safety needs, with deviations and improvements considered on a case-by-case basis. Under Alternative E, BLM would consider designating nonmotorized recreational trails in OHV limited and OHV areas within certain parameters for each RMZ consistent with the protection of GSENM. This would increase the potential for nonmotorized trail-based recreational access compared to Alternative A and D, but to a lesser extent compared to Alternative B and C.

Alternative E would clarify motorized aircraft use to include, but not be limited to, fixed-wing aircraft, helicopters, powered paragliders, electric aircraft, and drones and categorized by “manned” and “unmanned”. Under Alternative E, in the front country, passage, and outback areas manned motorized aircraft (fixed wing aircraft, helicopters, powered paragliders, electric aircraft), would only be allowed in areas designated as available for manned motorized aircraft use. Unmanned motorized aircraft systems (UAS/drones) would be allowed to take off and land on routes designated for motorized use but would be prohibited within 300 feet of developed recreation sites or areas. In the primitive zone, lands and takeoffs of both manned and unmanned motorized aircraft would be prohibited. The Boulder/New Home Bench Airstrip would remain the only backcountry airstrip available for motorized aircraft use until new travel management planning is completed. Other backcountry airstrips within OHV limited areas could be considered during implementation-level travel management planning. In the front country, passage, and outback impacts for manned motorized aircraft impacts would be the same as described for the front and passage area under Alternative C. For unmanned motorized aircraft in the front, passage, and outback areas, impact would be the same as described under Alternative A. For both manned and unmanned motorized aircraft in the primitive area impacts on access for motorized aircraft would be the same as those described under Alternative C for the outback and primitive management areas.

### **Cumulative Impacts**

The cumulative impacts analysis area is the planning area, the extent of transportation routes that intersect the planning area, and transportation routes in areas adjacent to the planning area. This area encompasses the full extent of transportation routes that could experience impacts resulting from management decisions in combination with other past, present, and reasonably foreseeable actions. Transportation and road networks adjacent to BLM-managed lands in the planning area include routes maintained by other federal, state, and county agencies and private landowners. Maintenance of and improvements to federal and state highways would provide arterial connections to BLM roads and county-maintained routes and would improve access throughout the planning area. However, the RMP will not affect use of existing state or federal highways or adjudicated roads. Potential increases in traffic from development under Alternatives B, C, and E, combined with increased traffic associated with local residents and an expected continued increase in visitors in the cumulative impacts analysis area, could cumulatively affect traffic and road conditions. Additionally, management decisions outside of GSENM that would provide OHV

opportunities, such as OHV open areas, could cumulatively affect traffic and road conditions by diverting recreationists to locations outside of GSENM.

See **Appendix F**, Analytical Framework, for a list of past, present, and future projects that could result in cumulative effects.

### **3.19 LANDS AND REALTY**

#### **3.19.1 Affected Environment**

The current conditions, trends and forecasts of lands and realty within the decision area are categorized into land use authorizations, utility corridors, communication sites, and land tenure (ownership). There are currently 137 active ROWs and other land use authorizations encumbering approximately 8,700 acres of BLM-managed land throughout the decision area. These primarily include access road ROWs and facility grants that have largely remained unchanged for decades. The land use authorizations include ROW grants for the Upper Valley Oil Field, federal highway material extraction under Title 23, and various uses such as communication facilities, utilities, and access roads authorized under different management plans (2000 MMP (BLM 200), 2020 GSENM RMPs (2020a) and the 2020 KEPA RMP (BLM 2020b)). Two main utility corridors exist within the decision area totaling 10,900 acres: a congressionally designated corridor along U.S. Highway 89 and a Section 368 corridor under the Energy Policy Act of 2005, which includes a significant power line (**Figure 3-41, Appendix A**).

There are two primary communication sites within the decision area and a single-use site, with detailed site management plans for Buckskin Ridge and Head of the Rocks, but not for Glen Canyon. Land tenure actions have focused on consolidating land ownership through land exchanges with the Utah Trust Lands Administration (formerly the Utah School and Institutional Trust Lands Association), acquisitions from willing sellers, and are guided by various RMPs and proclamations.

A slight decrease in ROW and land use authorization requests for film permits has been observed, attributed to changes in BLM filming guidance. However, this trend is expected to reverse following pending court decisions. Utility corridors are expected to see continued and potentially increased ROW projects, despite the closure of the Page, Arizona, coal plant in 2019. Communication sites are expected to see incremental development, with future plans including adjustments based on environmental assessments and existing site management plans. The BLM anticipates an increase in land acquisitions within GSENM, supported by the Land and Water Conservation Fund, though finding willing sellers may become more challenging. Land exchanges may be pursued to further the protective purposes of GSENM. Additional details on the current conditions, trends, and forecasts related to lands and realty can be found in **Section I.19 of Appendix I**.

#### **3.19.2 Environmental Consequences**

Refer to **Section F.24**, Lands and Realty, in **Appendix F**, Analytical Framework, for descriptions of the indicators, analysis areas, and assumptions used for the following analysis.

##### **Issue**

- How would proposed management affect land use authorizations and land tenure in the decision area?

### **Impacts Common to All Alternatives**

#### *Land Use Authorizations*

Valid and existing nonmineral ROWs would continue to be permitted, provided that their use does not conflict with the protection of GSENM. Therefore, any nonmineral authorizations affecting GSENM objects may be subject to adjustments under all alternatives. These adjustments could potentially impact the current uses of existing ROWs.

The BLM would manage the seasonal mule deer migration corridor along U.S. Highway 89 under each alternative as a seasonal avoidance area for ROWs (October 1 to April 30). Therefore, construction or maintenance of authorized ROWs during the seasonal avoidance period would be limited under all alternatives.

If ROWs are approved within GSENM, adjacent lands surrounding GSENM could see impacts from such developments, potentially impacting local communities and landowners.

Under all the alternatives, ROW avoidance and exclusion areas would apply to renewable energy development. Additionally, utility-scale renewable energy development would be prohibited within GSENM. Therefore, developers would need to seek alternative locations outside of GSENM. Any existing renewable energy ROWs could be impacted by the criteria for avoidance and exclusion areas.

#### *Land Tenure (Ownership)*

Under all the alternatives, the BLM would authorize only one access route to private land parcels unless public safety or local ordinances warrant additional routes. Under all the alternatives, all lands within GSENM would be withdrawn from all forms of entry, location, and sale. However, land exchange would be permitted under certain criteria and priorities discussed by alternative below.

### **Alternative A**

#### *Land Use Authorizations*

Under Alternative A, all lands would continue to be managed as either avoidance areas or open for ROWs, permits, and leases, with the exceptions of WSAs, which are exclusion areas. Any new authorizations would be required to be consistent with the protection of GSENM objects. Approximately 881,300 acres would continue to be managed as ROW exclusion areas, 332,800 acres would continue to be considered ROW avoidance areas, and 21,100 acres would continue to be considered ROW seasonal avoidance for the seasonal mule deer migration corridor along U.S. Highway 89. However, 630,400 acres would continue to be open to ROW authorization. This represents current management and therefore no impacts on land use authorizations would occur under this Alternative. However, the BLM could expect an increase in land use authorization applications dependent on updates to BLM film permit policy due to the recent court decisions.

#### Utility Corridors

Under Alternative A, the BLM would continue to manage 10,900 acres as designated ROW corridors in the decision area, including the Energy Corridor 68-116, which consists of 8,600 acres, and the congressionally designated utility corridor along U.S. Highway 89, which consists of 2,300 acres. This represents current management, and utility ROWs would continue to increase over time under this alternative. New facilities would likely continue to be concentrated within the designated U.S. Highway 89 corridor and other de facto corridors throughout the decision area. The 500-kilovolt Navajo-McCullough



power line would continue within Energy Corridor 68-116. Other pending fiber-optic lines, if approved, would be designated within the utility corridor along U.S. Highway 89. This represents current management and therefore no impacts on utility corridors would occur under this Alternative.

#### Communication Sites

Under Alternative A, the BLM would continue to authorize communication site facilities in areas open to new ROWs. Under Alternative A, BLM would manage 630,400 acres as open to ROW authorizations. Only these areas would be available for new communication sites, which make up for 35 percent of the decision area. This represents current management, and the BLM would continue to authorize new communication sites under this alternative.

#### *Land Tenure (Ownership)*

Under Alternative A, land tenure adjustments would only occur if they resulted in a net increase of TES habitat or benefit such species within GSENM.

To be considered for land acquisition or exchange under Alternative A, lands must further the protective purposes of GSENM and meet one or more of the following land tenure criteria:

- The acquisition or exchange is in the public interest and accommodates the needs of State, local, or private entities, including the needs for the economy, community growth, and expansion. Also, it is in accordance with other land use goals, objectives, and RMP planning decisions.
- The land acquisition or exchange results in a net gain of important and manageable resource values on public lands, such as crucial wildlife habitat, cultural sites, high-value recreation areas, high-quality riparian areas, live water, threatened and endangered species habitat, or areas key to maintaining productive ecosystems.
- The acquisition or exchange ensures accessibility of public lands in areas where access is needed and cannot otherwise be obtained.
- The acquisition or exchange is essential to allow effective management of public lands in areas where consolidation of ownership is necessary to meet resource management objectives.
- The acquisition or exchange results in acquisition of lands that serve a national priority as identified in national policy directives.

#### **Alternative B**

##### *Land Use Authorizations*

Under Alternative B, all lands would be managed as either ROW exclusion areas, avoidance areas, or open for ROWs, permits, and leases. Approximately 945,700 acres would be managed as ROW exclusion areas (7.3 percent more than under Alternative A). On a case-by-case basis the only exception to ROW exclusion areas would be to provide the minimum necessary function for local emergency services. Approximately 821,500 acres would be managed as ROW avoidance areas (almost 67 percent more than under Alternative A), and 13,300 acres would be considered ROW seasonal avoidance areas for the seasonal mule deer migration corridor along U.S. Highway 89. This difference in acres is due to additional areas being managed as ROW exclusion under Alternative B. Only 85,100 acres would be open to ROW authorization (87 percent less than under Alternative A). Areas with existing utility ROWs and designated utility corridors would be managed as open for ROW location. Therefore, it is expected that ROWs would be authorized under this alternative, but most would likely fall within ROW avoidance areas because

there are only 85,000 acres open to ROW authorization. Projects looking to route their ROW through or within GSENM, would be less likely to find a route under this alternative, relative to Alternative A.

#### Utility Corridors

Under Alternative B, the BLM would continue to manage 10,900 acres as designated ROW corridors in the decision area, including the Energy Corridor 68-116, which consists of 8,600 acres, and the congressionally designated utility corridor along U.S. Highway 89, which consists of 2,300 acres. However, utility corridors that fall within the seasonal avoidance area could see timing limitations to construction and maintenance activities, therefore confining ground-disturbing activities to certain times of the year.

#### Communication Sites

Under Alternative B, only 85,100 acres managed as open to ROWs would be available for new communication sites (87 percent less than under Alternative A). However, this decrease would likely not affect the development of new communication sites, as current communication sites only account for 4.5 acres within the decision area. The BLM would require applicants to demonstrate that no feasible sites outside GSENM exist for placement of facilities, prior to analyzing placement within GSENM. In combination with the reduced acreage managed as open to ROWs, this would likely reduce communication sites in the decision area relative to Alternative A.

#### *Land Tenure (Ownership)*

Under Alternative B, the BLM would remove the policy of considering net benefits of ESA-listed species during the land acquisition process. As a result, land tenure adjustments would be more likely under this Alternative relative to Alternative A.

Land acquisitions and exchanges would be pursued under Alternative B if the support management goals and objective, and further the protective purposes of GSENM. Priorities for land acquisitions and exchanges under Alternative B would include those that protect GSENM objects and at-risk resources, enhance management of GSENM objects, facilitate scientific discovery, or serve national policy directives.

### **Alternative C**

#### *Land Use Authorizations*

Under Alternative C, 1,163,500 acres would be managed as ROW exclusion areas (32 percent more than under Alternative A), 671,700 acres would be managed as ROW avoidance areas (65 percent more than under Alternative A), and 19,500 acres would be managed as ROW seasonal avoidance areas (same as under Alternative A). Only 10,900 acres would be open to ROW authorizations (98 percent less than under Alternative A). The BLM would authorize reasonable access routes to private inholdings. Under this alternative, there would likely be a decrease in new ROWs due to restrictions on ROW authorizations. This would impact projects looking to establish new ROWs within or through GSENM, as it is likely they would have to route around GSENM or carefully route their ROW within the 10,900 acres of land open for ROWs. This would also result in more ROWs being located on lands adjacent to or near, but not within, GSENM.

#### *Utility Corridors*

Under Alternative C, 10,900 acres would be managed as open to ROW authorization. Like Alternative A, the BLM would continue managing designated ROW corridors in the decision area as open for placement

of new ROWs, including the Energy Corridor 68-116, which consists of 8,600 acres, and the congressionally designated utility corridor along U.S. Highway 89, which consists of 2,300 acres. New ROWs could also be authorized outside of the preexisting designated utility corridors in avoidance areas if they meet the criteria identified in the RMP. Unlike Alternative B, no acres along existing utility ROWs outside of designated corridors would be managed as open to new ROWs, but the BLM would continue to allow renewal or upgrades of existing ROWs within the planning area. Therefore, the renewal application for the Navajo-McCullough 500-kilovolt power line, if approved, would continue within Energy Corridor 68-116. Also, if approved, the Lake Powell Pipeline would fall within the U.S. Highway 89 corridor.

#### *Communication Sites*

Under Alternative C, there would be no new communication sites in the outback and primitive areas to protect and restore soil health. New communication sites would be available for development only in the 10,900 acres managed as open to ROWs (98 percent less than under Alternative A). However, this decrease would likely not affect the development of new communication sites, as current communication sites only account for 4.5 acres within the decision area. The effects of requiring applicants to clearly demonstrate that no feasible off-GSENM alternatives exist for placement of facilities prior to analyzing placement within GSENM would be the same as those described under Alternative B.

#### *Land Tenure (Ownership)*

Impacts under this Alternative would be the same as those under Alternative B.

### **Alternative D**

#### *Land Use Authorizations*

Under Alternative D, no new ROWs would be authorized, except in the congressionally designated utility corridor, private inholdings, and in seasonal avoidance areas. However, most lands would be managed as ROW exclusion areas (1,608,800 acres; 83 percent more than under Alternative A). Therefore, projects seeking to apply for a ROW within GSENM not in the congressionally designated utility corridor or in the seasonal avoidance areas would likely not be allowed to route through GSENM and would need to route around GSENM instead or seek out another project area. Adjacent lands are likely to see an increase in ROWs under Alternative D. An additional 235,000 acres would be managed as ROW avoidance areas (24 percent less than under Alternative A), and 19,500 acres would be managed as ROW seasonal avoidance areas for the seasonal mule deer migration corridor along U.S. Highway 89 (same as under Alternative A). The effects of authorizing reasonable access to private inholdings, would be the same as those described under Alternative C.

#### Utility Corridors

Under Alternative D, 2,300 acres would be managed as open to ROW authorizations (99 percent less than under Alternative A). The Energy Corridor 68-116 would be undesignated, closing it to new ROWs; therefore, this would reduce the designated corridor acreage to 2,300 for the U.S. Highway 89 corridor.

#### Communication Sites

Under Alternative D, only 2,300 acres managed as open to ROWs would be available for new communication sites (99 percent less than under Alternative A). It is likely that few communication sites would be developed under Alternative D. The effects of requiring applicants to clearly demonstrate that

no feasible off-GSENM alternatives exist for placement of facilities prior to analyzing placement within GSENM would be the same as those described under Alternative B.

*Land Tenure (Ownership)*

Under Alternative D, effects of land tenure decisions would be the same as those described under Alternative B.

**Alternative E**

*Land Use Authorizations*

Under Alternative E, 1,251,800 acres would be managed as ROW exclusion areas (approximately 3 percent more than under Alternative A). The only exception to ROW exclusion areas would be on a case-by-case basis to provide the minimum necessary function for local emergency services, and within exclusion areas other than WSAs, the BLM would be able to authorize additional access to existing ROWs, widening of existing ROWs, and facility replacements. Therefore, ROW holders would be able to make upgrades as needed, consistent with the protection of GSENM objects. Under this Alternative, 583,400 acres would be managed as ROW avoidance areas (almost 2 times more than under Alternative A), and 19,500 acres would be managed as ROW seasonal avoidance areas (same as under Alternative A). Only 10,900 acres would be open to ROW authorizations (98 percent less than under Alternative A).

The BLM would authorize reasonable access to private inholdings as under alternatives C and D. Areas with existing utility ROWs and designated utility corridors would be managed as open for ROW location. Therefore, it is expected that ROWs would be authorized under this alternative, but most would likely fall within ROW avoidance areas because there are only 10,900 acres open to ROW authorization. This would impact projects looking to establish new ROWs within or through GSENM, as it is likely they would have to route around GSENM or carefully route their ROW within the 10,900 acres of land open for ROWs. This would also result in more ROWs being located on lands adjacent to or near, but not within, GSENM.

*Utility Corridors*

Under Alternative E, 10,900 acres would be managed as open to ROW authorization. Like Alternative A, the BLM would continue managing designated ROW corridors in the decision area as open for placement of new ROWs, including the Energy Corridor 68-116, which consists of 8,600 acres, and the congressionally designated utility corridor along U.S. Highway 89, which consists of 2,300 acres. New ROWs could also be authorized outside of the preexisting designated utility corridors in avoidance areas if they meet the criteria identified in the RMP.

Unlike Alternative B, no acres along existing utility ROWs outside of designated corridors would be managed as open to new ROWs, but the BLM would continue to allow renewal or upgrades of existing ROWs within the planning area as long as they remain consistent with the protection of GSENM objects. Therefore, the renewal application for the Navajo-McCullough 500-kilovolt power line, if approved, would continue within Energy Corridor 68-116. Also, if approved, the Lake Powell Pipeline would fall within the U.S. Highway 89 corridor.

*Communication Sites*

Under Alternative E, there would be no new communication sites in the outback and primitive areas to protect and restore soil health. New communication sites would be available for development only in the

10,900 acres managed as open to ROWs (98 percent less than under Alternative A). The effects of requiring applicants to clearly demonstrate that no feasible off-GSENM alternatives exist for placement of facilities prior to analyzing placement within GSENM would be the same as those described under Alternative B.

#### *Land Tenure (Ownership)*

Impacts under this Alternative would be the same as those under Alternative B.

#### **Cumulative Impacts**

Lands actions underway, which are proceeding to the extent legally possible, could be affected by decisions in this RMP. The Lake Powell Pipeline ROW is pending; the BLM could authorize part of this ROW on BLM-managed land within GSENM, depending on RMP decisions. In addition, the BLM could authorize more ROWs within GSENM, such as the [Garkane transmission ROWs](#) and the [Navajo-McCullough Powerline Right-of-Way](#).

There are two Title 23 material site ROWs in GSENM for exclusive use by the Federal Highway Administration. Prior to the establishment of GSENM, the Title 23 ROWs were granted to the Federal Highway Administration without an expiration date. The use levels in the Title 23 ROWs are not tracked and could be substantial, as entities can remove gravel, stone, riprap, and the like for use on projects funded by the Federal Highway Administration. Most BLM and local county projects are not able to utilize these materials because their projects are not funded by the Federal Highway Administration.

There are also various road maintenance and resource projects within and next to GSENM. However, these have no foreseeable overlap in space and time with lands and realty actions, and therefore no resultant cumulative effects.

### **3.20 SPECIAL DESIGNATIONS**

#### **3.20.1 Areas of Critical Environmental Concern, Research Natural Areas, and other Special Area Designations**

##### ***Affected Environment***

The ACEC procedures set forth in BLM Manual 1613 must be used as a basis for RNA designations. RNAs are considered a sub-category of ACECs. Certain special area designations that existed prior to GSENM designation were retained after monument designation and are considered in this section.

##### *Current Conditions*

The BLM called for new ACEC nominations in the NOI for this planning effort. The BLM used the criteria found at 43 CFR 1610.7-2 and guidance in BLM Manual 1613 (BLM 1988) in evaluating nominated areas. **Appendix H** summarizes that evaluation. Four ACECs, totaling approximately 195,600 acres, and six RNAs (ACECs), totaling approximately 70,850 acres, were evaluated as part of this effort. 56,300 acres of these areas are identified as potential ACECs or RNAs (ACECs) and are considered for designation and management in the alternatives in **Chapter 2**.

There are a variety of special area designations that predate GSENM. These include No Mans Mesa RNA (ACEC), which was established in 1986 and has been retained since Monument designation, the Wolverine Petrified Wood Natural Environmental Area that predated the initial GSENM designation, and eight areas designated in 1970 under Public Law 88-607 (September 19, 1964), which authorized the Secretary of the

Interior to classify certain lands for the purposes of disposal or retention. These areas included the following: Escalante Canyons Outstanding Natural Area (ONA), Calf Creek Recreation Area, Deer Creek Recreation Site, Devil's Garden ONA, Dance Hall Rock Historic Site, North Escalante Canyon ONA, The Gulch ONA, and Phipps Death Hollow ONA.

No Mans Mesa RNA (ACEC) was designated prior to the 1996 designation of GSENM and is the only RNA (ACEC) that pre-dates GSENM's designation. The 2000 GSENM MMP mentions No Mans Mesa RNA once, with no specific management direction. The 1,500 acre RNA (ACEC) was retained in the 2020 RMP to give primary emphasis on management of educational, scientific, and research values (BLM 2019, Appendix S). In the 2020 Approved RMP, the RNA (ACEC) designation provided protection for these values by closing the RNA (ACEC) to motorized OHVs, managing the area as unavailable for livestock grazing and prohibiting campfires. This RNA (ACEC) was evaluated in the current planning process and is part of the proposed RMP (section 2.4).

Prior to FLPMA, areas could be designated under 43 CFR 2070, and managed under 43 CFR 8352. Additionally, in June 1970, regulations were established at 43 CFR 6220 for Protection and Preservation of Natural Values, including natural areas, later termed outstanding natural areas (ONAs). These regulations pertained to the 1970 designations above. However, 43 CFR 2070 and 43 CFR 8352 were withdrawn in 1994, having been superseded with the passage of FLPMA. As stated in BLM Manual 1613, areas previously designated under such regulations and authorities other than FLPMA can be reviewed and if warranted designated as ACECs, using the ACEC designation process, during resource planning.

With the removal of 43 CFR 2070 and 43 CFR 8352, the prior ONAs remained under the existing dual designation of Wilderness Study Areas (WSAs). The Devils Garden WSA includes the prior Devils Garden ONA. The Escalante Canyons ONA tracts 1 and 5 are each their own WSA. The North Escalante Canyon/The Gulch WSA contains North Escalante Canyon ONA, Escalante Canyons ONA tracts 2, 3, 4, and the Gulch ONA. The Phipps-Death Hollow WSA contains Phipps-Death Hollow ONA.

The 2000 MMP and the 2020 RMP erroneously carried forward some of these area designations. The 2000 MMP acknowledges the past designations and states that since GSENM itself is a withdrawal, some of these may no longer be needed and would be modified or revoked. The 2000 planning process did not make any designation using the ACEC designation process, and no special management was given. During the planning process for the 2020 GSENM and KEPA Approved Plans (BLM 2020a and b, respectively), no ONAs were evaluated for designation as ACECs. Two past ONAs are mentioned as overlapping with Resource Management Zones (Devil's Garden and The Gulch), but no related management was given.

In the Proposed RMP, the 1970 special area designations of Calf Creek Recreation Site, Deer Creek Recreation Site, and Dance Hall Rock Historic Site would be managed under the recreation program as would Calf Creek Recreation Area, Deer Creek Recreation Area, and Dance Hall Rock.

**Figure 2-36** (Alternatives A and D: Areas of Critical Environmental Concern and Research Natural Areas) in **Appendix A** shows these special area designations within the decision area.

### **Environmental Consequences**

Refer to **Section F.25**, Special Designations – Areas of Critical Environmental Concern, Research Natural Areas, and other Special Area Designations, in **Appendix F**, Analytical Framework, for descriptions of the indicators, analysis areas, and assumptions used for the following analysis.

3. Affected Environment and Environmental Consequences (Areas of Critical Environmental Concern, Research Natural Areas, and other Special Area Designations)

Issue

- How would management affect the relevant and important values of potential ACECs and RNAs (ACECs)?

Impacts Common to All Action Alternatives

Across all action alternatives, the management of No Mans Mesa RNA (ACEC) would remain the same. This would contribute to GSENM goals of protection of objects, and the preservation of historic and scientific interests.

Alternative A

Under Alternative A, ACECs, RNAs (ACECs), and other special area designations would continue to be managed in accordance with the 2020 GSENM and KEPA RMPs (BLM 2020a and b, respectively). The GSENM has one designated RNA (ACEC), No Mans Mesa, as shown in Table 3-70. Other areas carried forward in the 2020 RMPs had no associated management direction.

**Table 3-70. ACECs, RNAs (ACECs), and other Special Area Designations – Alternative A**

| Special Designation             | Acres        | Relevant and Important Values                | Management Direction  |
|---------------------------------|--------------|--|---|
| No Mans Mesa RNA (ACEC)         | 1,500        | Educational, scientific, and research values | <ul style="list-style-type: none"> <li>• Manage as unavailable for livestock grazing</li> <li>• Close to motorized OHV use</li> <li>• Prohibit campfires</li> </ul> |
| <i>Total designated acreage</i> | <i>1,500</i> |  |   |

Source: BLM GIS 2022

Designating and protecting 1,500 acres as an RNA (ACEC) under Alternative A would contribute to GSENM’s goals of preservation of historic and scientific interests. Certain other nominated ACECs, not designated, were first evaluated to determine if their relevant and important values would be subject to potential impacts by not having specific special management implemented (See Appendix H for those nominations found to need special management). For example, undesigned nominated ACECs might not be managed as ROW exclusion, opening the areas to ROW development, which might impact paleontological, geological, cultural, or vegetation resources, and scientific opportunity. Scientific research might not be facilitated, which could preclude new discoveries. The undesigned nominated ACEC areas might be available for livestock grazing, leading to potential impacts from livestock grazing such as trampling of vegetation or potential destruction of paleontological, geological, cultural, and scientific research values.

Alternative B

Under Alternative B, two RNAs (ACECs) would be designated, as shown in Table 3-71.

**Table 3-71. ACECs, RNAs (ACECs), and other Special Area Designations – Alternative B, C, and E**

| Special Designation             | Acres         | Relevant and Important Values   | Management Direction  |
|---------------------------------|---------------|---|---|
| Fiftymile Mountain RNA (ACEC)   | 54,800        | Cultural resources and scientific opportunity<br><br>Water Resources                                | <ul style="list-style-type: none"> <li>• Develop cultural resources monitoring plan and coordinate with the grazing permittees to identify potential impacts from livestock grazing. The cultural resources monitoring plan would include adaptive management thresholds that indicate appropriate level of grazing, including no grazing for the protection of cultural resources in the applicable allotment management plans.</li> <li>• Allow camping by permit only. Permits must be approved by the archaeologist.</li> <li>• Manage as ROW exclusion</li> <li>• Facilitate scientific research</li> <li>• Conduct level 2 spring inventories per Spring Stewardship Institute and develop a water resource monitoring plan. The water resources plan would include adaptive management to protect and restore relevant and important water resources.</li> </ul> |
| No Mans Mesa RNA (ACEC)         | 1,500         | Vegetation and scientific opportunity (undisturbed control area for research<br><br>Water Resources | <ul style="list-style-type: none"> <li>• Prohibit firewood gathering</li> <li>• ROW exclusion</li> </ul>  |
| <i>Total designated acreage</i> | <i>56,300</i> |   |   |

Source: BLM GIS 2022

Fiftymile Mountain RNA (ACEC), comprised of 54,800 acres, includes unusual density of water resources and significant cultural values, including a cultural crossroads of the Fremont and Ancestral Pueblo cultural groups, with sites spanning multiple time periods. The RNA (ACEC) contains the highest density of cultural sites within GSENM, and many are considered fragile, sensitive, and irreplaceable resources that are threatened and vulnerable to adverse change. A unique cultural melting pot, the area contains diverse scientific research opportunities for archaeological resources. Designation would protect these vulnerable cultural resources and provide scientific opportunity. Management actions to protect these resources (See Appendix H pp. H-49 and H-53) include developing a cultural resources monitoring plan to ensure awareness of, and management response to, changes in these cultural resources, and camping by archaeologist-approved permit only, which would ensure appropriate location, timing, and other factors related to cultural resource management. The RNA (ACEC) would be managed as ROW exclusion to support the retention of the integrity of the cultural landscape, contexts, and other cultural considerations that may be present in the area, and facilitating scientific research for timely and sensitive research (e.g.



inventory, documentation, and analysis) to better understand resources in the area. Additionally, a level 2 spring inventory would be conducted and a water resources monitoring plan would be developed to ensure awareness of the water resources present, and management response to potential changes in these water resources. See **Section 3.16**, Livestock Grazing, for more information on a coordinated monitoring plan.

Alternative B includes additional management actions for No Mans Mesa RNA (ACEC). Prohibiting firewood gathering and managing the area as ROW exclusion would provide substantial protection from campfire effects and support the retention of the integrity of the reference vegetation present in the area (see Appendix H p. H-55). These two management actions under Alternative B would align RNA (ACEC) management with GSENM’s goals of preservation of historic and scientific interest.

In total under Alternative B, 56,300 acres would be designated as RNAs (ACECs), contributing to GSENM’s goals of preservation of historic and scientific interests. Compared with Alternative A, an additional 54,800 acres (nearly 38 times more than under Alternative A) would be designated.

*Alternative C*

Impacts and designations under Alternative C would be identical to those identified in Alternative B.

*Alternative D*

No new ACECs or RNAs (ACECs) are included in Alternative D. The existing RNA (ACEC) (Table 3-72) would be managed similar to Alternative A, but would implement special management actions as in Alternative B, prohibiting firewood gathering and managing as ROW exclusion.

**Table 3-72. ACECs, RNAs (ACECs), and other Special Area Designations – Alternative D**

| Special Designation             | Acres        | Relevant and Important Values   | Management Direction   |
|---------------------------------|--------------|---|--|
| No Mans Mesa RNA (ACEC)         | 1,500        | Vegetation resources and scientific management<br><br>Water Resources | <ul style="list-style-type: none"> <li>Prohibit firewood gathering</li> <li>ROW exclusion</li> </ul> |
| <i>Total designated acreage</i> | <i>1,500</i> |   |  |

Source: BLM GIS 2022

Under Alternative D, 1,500 acres would be managed as an RNA (ACEC). Resources in this area would remain protected under GSENM’s objects of preservation of historic and scientific interests. Compared with Alternative A, there would be no change in designated special management area acres under Alternative D, but the special management actions would be the same as in Alternatives B and C. Additionally, because Alternative D restricts certain discretionary actions that could impact relevant and important values of potential ACECs, this alternative would provide substantially more protection than Alternative A.

*Alternative E*

Under Alternative E, designations and impacts would be identical to Alternative B.

### *Cumulative Impacts*

Past and present actions in the cumulative impacts analysis area affecting ACECs, RNAs (ACECs), and other special area designations include grazing, recreation, [lands and realty actions](#), and travel management. Effects from these actions include surface and vegetation disturbance, [trampling](#), and [other](#) changes to the landscape that can affect the relevant and important values of paleontological, geological, [soil](#), vegetation, cultural, [and other resources](#), and opportunity for scientific research. Effects on relevant and important values could occur quickly, but would likely recover slowly and would be irreparable in the case of some impacts on paleontological resources, cultural resources, and opportunities for scientific discovery.

Reasonably foreseeable future actions are likely to have similar effects as the past and present actions. Grazing, recreation, [lands and realty actions](#), and travel management are expected to continue. Under Alternative A and D, [for the undesignated ACECs \(Fiftymile Mountain RNA \[ACEC\]\)](#), these effects would continue to impact the identified relevant and important values [that need special management](#). Under Alternatives B, C, and E, all potential ACECs [that need special management](#) would be designated, and relevant and important values would be protected and incremental effects on those values limited due to ACEC management actions. Under Alternative D, in the undesignated potential ACEC ([Fiftymile Mountain RNA \[ACEC\]](#)), [certain](#) other resource management actions would be restrictive [due to the overall design of Alternative D](#), and therefore [might](#) contribute to protecting relevant and important values. These include, [for example, OHV closure or limitations to designated routes, and ROW exclusion or avoidance](#). In Alternatives A and D, due to the nature of GSENM designation, some, but not all, of the identified relevant and important values in undesignated potential [RNA \(ACEC\) might be protected through general GSENM management](#).

### **3.20.2 National Trails**

National trails include congressionally designated historic and scenic trails and administratively designated recreation trails. Scenic trails are established “for maximum outdoor recreation potential, and for the conservation and enjoyment of the nationally significant scenic, historic, natural, or cultural qualities of the areas through which such trails may pass” (BLM 2012c). Historic trails are “extended trails which follow as closely as possible and practicable the original route or routes of travel of national historical significance” and are designated for “the identification and protection of the historic route and its historic remnants and artifacts for public use and enjoyment” (BLM 2012c). National recreation trails are established for “a variety of compatible outdoor recreation uses in or reasonably accessible to urban areas or high-use areas” (BLM 2012d). While similar to historic and scenic trails, [national recreation trails](#) are designated by the BLM and do not require congressional approval.

### ***Affected Environment***

There are 38 miles of the Armijo Route, a segment of the OSNHT, within the decision area (**Figure 3-22**, Scenic Routes, **Appendix A**). Twenty-four miles of the OSNHT along the Armijo Route’s Box of the Paria segment are recognized as a “high-potential route segment.” This term is used in the National Trails System Act for segments of a trail that afford high-quality recreation experiences along a portion of the route having greater-than-average scenic values or affording an opportunity to share vicariously the experience of the original users of a historical route (16 USC 1241, *et seq.*). To the east and west, the remaining 12 miles of the OSNHT cross and parallel U.S. Highway 89 and electrical distribution lines in the area formerly known as the KEPA. [This section and Appendix I, Section I.19.2 provide additional detail on the current conditions, trends, and forecast for the OSNHT.](#)

The greater OSNHT crosses rugged terrain characteristic of the American West, that ranges across extreme elevation changes from the Rocky Mountains to the Mojave Desert. The OSNHT features a wide range of scenic, historical, recreation, and natural attributes along a highly significant course that served as the principal overland trade route through northern Mexico in the second quarter of the nineteenth century. In the second half of the nineteenth century, the route continued to be used for expeditions, military transport, and immigration purposes.

The BLM OSNHT Inventory, Assessment, and Monitoring Report was completed in October 2023 after the publication of the Draft EIS and is included as **Appendix N** in the Proposed RMP/Final EIS to provide further details on the trail segments and values. The inventory for the OSNHT Inventory, Assessment, and Monitoring Report was conducted in four segments developed from viewshed analysis, termed inventory analysis units. From west to east these units were:

- *US 89 West.* Highway 89 follows and serves as the primary means to experience the OSNHT. Though the road itself does not significantly detract from the historic setting, which include distant views across Telegraph Flat bounded by the Vermillion Cliffs, it does introduce noise and motion from traffic, cut/fill slopes, and above ground utilities. Primary uses in the US 89 West IAU include horseback riding, OHV driving on designated routes on public land, reading interpretive brochures, and publications and sightseeing.
- *Paria Breaks.* As the OSNHT approaches the Vermillion Cliffs and the Paria-Hackberry WSA, the few human modifications present do not detract from the historic setting. Narrow dirt roads are the primary means to experience the OSNHT and primary uses include cross-country walking, horseback riding, OHV driving on designated routes, and sightseeing. The Box of the Paria high-potential route segment begins in the eastern half of this inventory analysis unit, and specific location of the OSNHT has been verified by the remnants of subsequent wagon road use.
- *Paria River.* The Box of the Paria portion of the corridor is just south of the ghost town of Paria. Because these three sites are not contemporaneous with Armijo's travel along the Old Spanish Trail and the period of significance (AD 1829 - 1848), they somewhat impact the integrity of the historic setting. Primary uses include cross-country walking, horseback riding, OHV driving on designated routes, photography, reading interpretive brochures and publications and sightseeing. Cottonwood Canyon Road is a popular Utah Scenic Backway for autotouring, dispersed camping, and geology. The Box of the Paria high-potential route segment and specific location of the OSNHT has been verified by the remnants of subsequent wagon road use.
- *US 89 East/Lower Paria.* This inventory analysis unit moves from the scenic Cockscomb WSA and returns to the Highway 89 corridor with dozens of buildings, open mining, a network of private and recreational roads and associated traffic and noise, the Paria Contact Station, power lines, ponds, livestock grazing, fences, and other range improvements impact the setting. The integrity of the historic setting is not retained from the heritage route east to where the trail leaves GSENM. Primary uses included horseback riding, OHV driving on designated routes on public land, reading interpretive brochures and publications and sightseeing.

A total of 44 archaeological inventories have been previously conducted within the OSNHT Inventory, Assessment, and Monitoring Report literature review area. Of these, 19 previous archaeological inventories intersect the NHT alignment. Most of the corridor has not undergone Class III archaeological survey. Eleven previously documented archaeological sites intersect the OSNHT alignment. Only one

documented archaeological site, which is the OSNHT Heritage Route wagon road, is associated with Armijo's use of the OSNHT.

Unlike many other Old Spanish NHT segments that have deteriorated due to modern development, the inventory finds that the GSENM study segment still exemplifies the OSNHT's nature and purposes. Unmanaged recreation demand may lead to overuse or road and facility improvements detract from the historic setting integrity. However, it is also the National Trails System Act's policy to promote public access, travel, enjoyment, and appreciation of historic travel routes. Therefore, a balance is sought between maintain the integrity of a trail's historic recreation setting and public access and enjoyment.

Public awareness of the OSNHT is low yet with a high potential for enhanced access and interpretation. The OSNHT Inventory, Assessment, and Monitoring Report did not find extensive interpretation of the OSNHT at the nearby BLM GSENM visitor centers in Kanab and Big Water, Paria Contact Station, or other local museums in Kanab or Page, Utah. Within GSENM, the OSNHT is only signed or interpreted at the US 89 Paria Road Wayside and the Paria Contact Station where interpretive brochures and publications are available. Specific recommendations for improving recreation, scenic, and cultural opportunities can be found in **Section 3.1** of **Appendix N**.

The OSNHT Inventory, Assessment, and Monitoring Report (**Appendix N**) identifies potential threats from grazing improvements and vegetation treatments that could detract from the OSNHT management corridor's historic setting. Other potential threats include visually intrusive features such energy transmission lines, substations and access roads; recreational access, US Highway 89 traffic and ambient noise; and development on private lands at GSENM's boundary.

The OSNHT Inventory, Assessment, and Monitoring Report identified fifteen livestock grazing allotments intersect the inventory assessment units (see **Table A-4** and **Figure A-7** in **Appendix N**). Of these, 20 percent do not meet BLM Utah Rangeland Health Standards as measured by proper functioning condition assessments. Since 2006, the BLM, in coordination with livestock grazing permittees, has made changes in the Coyote, Mollies and Vermilion allotments. Such changes include seeding restoration, a seasons-of-use restriction, range improvement maintenance, voluntary nonuse, and feral cattle removal. As a result of these changes, many areas that did not meet standards are now making progress toward doing so, based on recent upland assessments.

Several other trails in GSENM are not currently designated; however, they have the potential for proposal as national recreation trails. These include the Hole-in-the-Rock Trail, Boulder Mail Trail, and Great Western Trail.

### **Environmental Consequences**

Refer to **Section F.26**, Special Designations – National Trails, in **Appendix F**, Analytical Framework, for descriptions of the indicators, analysis areas, and assumptions used for the following analysis.

#### *Issue*

- How would management affect the nature and purpose of the OSNHT?

### *Impacts Common to All Alternatives*

All alternatives include direction for the establishment of an OSNHT management corridor, though due to the recent completion of the OSNHT Inventory, Assessment, and Monitoring Report (**Appendix N**) after the publication of the Draft EIS, only Alternative E includes a fully developed management corridor and more specific management directions addressing a range of uses and is discussed below. Potential impacts from other management direction and uses across the alternatives is discussed below, though impacts from such uses and direction including livestock grazing, recreation, travel management, and vegetation management could be prohibited in all alternatives if there were found to substantially interfere with the nature and purpose of the OSNHT. Natural landscape elements occurring during the periods of significance include upland and riparian communities, the Paria River, geological features, and dark night skies. Management direction which protect, and enhance where necessary, these elements would enhance the natural resources, qualities, and setting of the OSNHT management corridor.

### *Alternative A*

Under Alternative A, the OSNHT would continue to be managed in accordance with the 2020 GSENM and KEPA RMPs (BLM 2020a and b, respectively). The BLM would continue to manage the landscape and viewshed associated with the OSNHT so that visitors may gain a sense of how the landscape influenced commercial trade along the trail. This would be done by establishing an OSNHT management corridor along the Box of the Paria high-potential segment, restricted by including areas within the viewshed or on 0.5 miles either side of the corridor centerline, whichever is less. The BLM would continue to promote the preservation and appreciation of the OSNHT by prohibiting discretionary actions that would substantially interfere with the nature and purpose of the OSNHT. The BLM would also allow discretionary actions compatible with the protection of the purpose and nature, resources, qualities, values, and settings on the high-potential sites and segments of the OSNHT.

Portions of 15 livestock grazing allotments totaling 557,851 acres are located in the OSNHT Inventory, Assessment, and Monitoring Report project area, all of which would be available under Alternative A. This could lead to user conflicts within the OSNHT management corridor, as well as potential impacts to the resources, qualities, values, and settings of the OSNHT. Recreational shooting would be prohibited within 0.25 miles of residences, campgrounds, and developed recreation sites and areas under Alternative A, which could leave portions of the OSNHT management corridor open to the potential for impacts from user conflicts and noise. All of the OSNHT would be managed as limited to OHV travel to designated routes under Alternative A.

### *Alternatives B, C, and D*

Under alternatives B, C, and D the OSNHT management corridor would be established with parameters determined by the OSNHT Inventory, Assessment, and Monitoring Report. Under alternatives B, C, and D the corridor would prohibit discretionary uses that would substantially interfere with the nature and purposes of the OSNHT, affording a potentially greater area and degree of protection for corridor, which would include managing the corridor as ROW exclusion.

Under Alternatives B and C, portions of 14 of the 15 grazing allotments that intersect with the OSNHT Inventory, Assessment, and Monitoring Report project area would be available for grazing. Only portions of the Cottonwood allotment would be unavailable under Alternatives B and C, with potential effects similar to those Alternative A. Under Alternative D, all of nine allotments that intersect with the OSNHT Inventory, Assessment, and Monitoring Report project area would be unavailable for grazing, totaling

501,306 acres and leaving 56,815 acres in portions of six allotments as available for grazing resulting in the reduced potential for user conflicts and impacts from grazing under Alternative D as compared alternatives A, B, and C.

Recreational shooting under Alternative B would be prohibited in the same areas as Alternative A as well as in WSAs, which could add more protection to the OSNHT management corridor from user conflicts and noise impacts. Under Alternative C, recreational shooting would be prohibited in the front country and primitive areas, and on, or across highways and within 0.25 miles of residences, campgrounds, and developed recreation facilities resulting in reduced potential for user conflicts and noise impacts compared to Alternatives A, B, and C. Recreational shooting would be prohibited in all of GSENM under Alternative D. Other recreation management such as camping restrictions and limitations on SRPs would limit potential impacts to the OSNHT management corridor with progressively greater limitations on camping, group size, and other SRP-authorized activities in Alternatives B through D with the additional layer of management area prescriptions for Alternative C.

Under Alternatives B, C, and D all GSENM and the OSNHT management corridor would be either closed to OHV use or limited to designated routes, which could reduce the potential for user conflicts and noise and other impacts resources, qualities, values, and settings of the OSNHT management corridor such physical ground disturbance. Alternatives B through D progressively manage larger areas as OHV closed.

#### *Alternative E*

Under Alternative E, the OSNHT Management Corridor totaling 78,600 acres would be designated (**Figure 3-22, Appendix A**), which was developed using a combination of viewshed analyses and the inventory analysis units of the OSNHT Inventory, Assessment, and Monitoring Report (see **Appendix N**). Under Alternative E, management direction for the OSNHT Management Corridor would improve and facilitate recreational facilities by providing appropriate facilities, interpretation, signage (see **Appendix N** for recommendations), and the development of an Activity Plan to specific appropriate uses within the OSNHT Management Corridor. Additionally, recreation within the Paria River and Paria Breaks OSNHT inventory analysis units would be managed to emphasize high-quality recreation opportunities and exceptions to group size limits may be authorized within the corridor to prevent other management area prescriptions from over-riding the goals and objectives of NHT management. ROW avoidance and exclusion, and VRM Class I or II management outside of Congressionally designated utility corridors (managed as VRM Class III) would also serve to protect the purpose and nature, resources, qualities, values, and settings of the OSNHT under Alternative E.

Under Alternative E, grazing availability in the allotments that intersect the OSNHT Inventory, Assessment, and Monitoring Report project area would be the same as under alternatives B and C. Under Alternative E recreational shooting would be prohibited within 600 feet of locations with archeological and historical resources, the front country, and within 600 feet of residences, campgrounds, and developed recreation facilities in the passage, outback, and primitive areas providing a similar level of potential user conflicts and noise impacts as under Alternative C. Under Alternative E the same front country, passage, and outback areas would be managed as OHV limited to designated routes and primitive areas as OHV closed as under Alternative C and the same potential for user conflicts and noise and other impacts resources, qualities, values, and settings of the OSNHT management corridor such physical ground disturbance would exist under Alternative E as under Alternative C. Under Alternative E, other recreation management such as camping restrictions and limitations on SRPs would have similar impacts under

Alternative C, though Alternative C provides more detailed camping management for all GSENM areas including stay limits, quiet hours, and prohibitions camping in proximity to riparian areas and cultural resources.

#### *Cumulative Impacts*

Past and present actions in the cumulative impacts analysis area affecting the OSNHT management area include grazing, recreation, travel management, and vegetation management (see **Appendix F**). Effects from these actions include user conflicts, surface and vegetation disturbance, trampling, noise and other changes to the landscape that can affect resources, qualities, values, and settings of the OSNHT management corridor. However, the cumulative impacts from these actions would likely be minimized as they could be prohibited within the OSNHT management corridor in all alternatives if there were found to substantially interfere with the nature and purpose of the OSNHT. As Alternative E management direction for the OSNHT management corridor was developed after the completion of the OSNHT Inventory, Assessment, and Monitoring Report it includes the most thorough and specific management direction to prevent such cumulative impacts.

### **3.20.3 Scenic Routes**

#### ***Affected Environment***

##### *Current Conditions*

##### National Scenic Byways

The National Scenic Byways Program is part of the U.S. Department of Transportation, Federal Highway Administration. The program was developed to help recognize, preserve, and enhance selected roads throughout the United States by designating certain roads as National Scenic Byway or All-American Roads based on their intrinsic qualities (archaeological, cultural, historical, natural, recreational, and scenic). To be designated a National Scenic Byway, a road must possess characteristics of regional significance within at least one of the intrinsic qualities. All-American Roads must possess characteristics of national significance in at least two of the intrinsic qualities. An All-American Road, Scenic Byway 12, occurs within the decision area, and is a 124-mile scenic route. Scenic Byway 12 is one of only 40 All-American Roads in the United States and the only All-American Road in Utah. The BLM maintains the characteristics of the route as it crosses through GSENM (**Figure 3-22**, Scenic Routes, **Appendix A**).

##### Utah Scenic Backways

State Scenic Backways have been designated by state declaration for their scenic, historical, and recreational qualities, but are roads that do not generally meet federal safety standards for safe year-round travel by passenger cars. Backways often require four-wheel-drive vehicles, and road conditions can vary due to season and weather. There are seven Utah Scenic Backways in the decision area (**Figure 3-22**, Scenic Routes, **Appendix A**):

##### Burr Trail Road

The Burr Trail is one of the most picturesque drives in Utah. Paved and graded, this gravel and dirt road extends from Boulder to Bullfrog Marina passing through GSENM for 30 miles before crossing into Capitol Reef National Park and then into Glen Canyon. Burr Trail Road also connects with Notom Road in the Waterpocket Fold backcountry of Capitol Reef National Park.

#### Hole-in-the-Rock Road

This route begins 5 miles east of the town of Escalante off Scenic Byway 12. It is a 62-mile road that follows the general route of the pioneer Hole-in-the-Rock Expedition to search for a route across the Colorado River (what is now Lake Powell). The last 5 miles of the road are within the boundaries of Glen Canyon. Devil's Garden, Dance Hall Rock, and Dry Fork Slot Canyons are popular day-use destinations along this route. It also provides access to many popular overnight routes in the Escalante Canyons.

#### Posey Lake Road

This 40-mile backway heads north from the town of Escalante and climbs Escalante Mountain in Dixie National Forest. It provides access to Posey Lake and Posey Lake Campground, as well as many Forest Service roads ideal for exploring by an OHV or mountain bike. It borders the Escalante Canyons Unit for the first 8 miles out of Escalante.

#### Smoky Mountain Road

This backway winds for 78 remote miles connecting Scenic Byway 12 and U.S. Highway 89. It offers unparalleled views of Navajo Mountain and the Kaiparowits Plateau as it passes through stretches of GSENM. Travelers along the backway can occasionally see smoke smoldering from 100-year-old coal fires deep beneath the aptly named Smoky Mountain.

#### Cottonwood Canyon Road

The 47-mile Cottonwood Canyon Road connects Scenic Byway 12 in Cannonville with U.S. Highway 89 to the south between Kanab and Big Water. It passes Kodachrome Basin State Park and offers numerous opportunities to explore GSENM, ranging from short hikes to backpacking excursions. Popular destinations include Cottonwood Narrows and Grosvenor Arch. Approximately 35 miles of the backway pass through GSENM.

#### Paria River Valley Road

This short track descends from the junction with U.S. Highway 89 (milepost 31) into a valley with the remains of the Paria ghost town and the site of a 1930s movie set; both are surrounded by colorful rocks. The road is 6 miles long and becomes steep and twisting near the end, as it crosses the undulating banded hills that cover this area.

#### Johnson Canyon/Alton Road

This 32-mile scenic route begins 9 miles east of Kanab on U.S. Highway 89 and heads north, rejoining U.S. Highway 89 at Glendale. An alternate route extends north to Alton, 9 miles north of Glendale. The backway travels through the western part of GSENM, partially along GSENM's boundary.

#### BLM Back Country Byways

The BLM developed its Back Country Byway Program to complement the National Scenic Byways Program. These byways highlight the spectacular nature of western landscapes. Back Country Byways vary from narrow, graded roads, passable only during a few months of the year, to two-lane paved highways providing year-round access. There are no BLM Back Country Byways or BLM backways in the planning area.



### Environmental Consequences

Refer to **Section F.27**, Special Designations – Scenic Routes, in **Appendix F**, Analytical Framework, for descriptions of the indicators, analysis areas, and assumptions used for the following analysis.

#### Issue

- How would management impact the viewshed surrounding scenic routes and the experience of enjoying scenic routes within the planning area?

#### Impacts Common to All Alternatives

Under all alternatives, scenic routes would be authorized through implementation actions for reasonable and necessary improvements to support safe passage. Improvements would be consistent with protecting GSENM objects. There would be no new designations or changes of route miles of scenic routes. Designated scenic routes, as shown in **Table 3-73**, would remain unchanged across alternatives.

**Table 3-73. Designated Scenic Routes included in All Alternatives**

| Route                     | Length (miles) | Designation         |
|---------------------------|----------------|---------------------|
| Scenic Byway 12           | 32             | All-American Road   |
| Burr Trail Road           | 30             | Utah Scenic Backway |
| Hole-in-the-Rock Road     | 45             | Utah Scenic Backway |
| Posey Lake Road           | 3              | Utah Scenic Backway |
| Smoky Mountain Road       | 62             | Utah Scenic Backway |
| Cottonwood Canyon Road    | 35             | Utah Scenic Backway |
| Paria River Valley Road   | 5              | Utah Scenic Backway |
| Johnson Canyon/Alton Road | 6              | Utah Scenic Backway |

Source: BLM GIS 2022

#### Alternative A

Under Alternative A, designated scenic routes would continue to be managed to protect the values for which they were established. Under Alternative A, there would be no **additional** management of the viewshed as seen from the designated scenic routes. Impacts within the viewshed from surface development or disturbance **could continue, resulting** in changes to the overall enjoyment of the routes from the American public.

The BLM would continue to **manage** designated Utah Scenic Backways as Scenic or Backcountry Byways, which would maintain and manage the values for which they were established. The BLM would not consider new BLM Back Country Byways, which could mean loss of potential values of future BLM Backways.

#### Alternatives B, C, and E

Under Alternatives B, C, and E, designated scenic routes would be managed to protect and enhance the values for which they were designated, the same as under Alternative A. However, under Alternatives B, C, and E, designated **BLM Backcountry Byway** status would be considered for the seven Utah Scenic Backways and Skutumpah Road. VRM Class II management actions would be applied to the foreground/middle ground distance zones for all designated scenic byways. **The acreages for the foreground/middle ground for Alternatives B, C, and E are included in Table 3-74** VRM Class II

**Table 3-74. Foreground/Middle ground Acreages for Alternatives B, C, E**

| <b>VRM Class</b>     | <b>Acres</b>   |
|----------------------|----------------|
| <b>Alternative B</b> |                |
| VRM Class I          | 286,100        |
| VRM Class II         | 388,300        |
| VRM Class III        | 800            |
| <i>Total</i>         | <i>675,200</i> |
| <b>Alternative C</b> |                |
| VRM Class I          | 337,200        |
| VRM Class II         | 337,300        |
| VRM Class III        | 800            |
| <i>Total</i>         | <i>675,200</i> |
| <b>Alternative E</b> |                |
| VRM Class I          | 377,900        |
| VRM Class II         | 294,300        |
| VRM Class III        | 3,000          |
| <i>Total</i>         | <i>675,200</i> |

Source: BLM GIS 2024

management actions would include retaining the existing character of the landscape, meaning that the level of change to the landscape would be low. This would protect the viewshed and allow for the overall enjoyment of the designated scenic byway by the American public. Additionally, management activities may be seen but should not attract the attention of the casual observer, and any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape. More information on VRM Class II management can be found in **Section 3.10, Visual Resources**.

When compared with Alternative A, Alternatives B, C, and E would include the potential for consideration of new scenic byways. This could lead to new designations, which would increase the total acreage managed as VRM Class II.

#### *Alternative D*

Under Alternative D, designated scenic byways would be managed similar to Alternatives B and C; however, viewsheds would not be managed as VRM Class II by the foreground or middle ground zones, but would instead be managed by a 5-mile corridor from the byway centerline. The acreages for the foreground/middle ground for Alternatives B, C, and E are included in **Table 3-75**. This corridor would be managed as VRM Class II, like Alternatives B and C (with low levels of change to the landscape). The extent of the 5-mile corridor would include the majority of the foreground and middle ground zones and would extend 5 miles. This would provide additional protections of the viewshed.

**Table 3-75. Foreground/Middle ground Acreages for Alternative D**

| <b>VRM Class</b> | <b>Acres</b>   |
|------------------|----------------|
| VRM Class I      | 504,400        |
| VRM Class II     | 170,800        |
| <i>Total</i>     | <i>675,200</i> |

#### *Cumulative Impacts*

Past and present actions in the cumulative impact analysis area affecting scenic byways include actions that impact viewsheds due to surface disturbance, including mineral exploration and development, and recreation activities.

Alternative D would contribute the least to overall adverse cumulative impacts on designated scenic byway because it provides the greatest protections of the routes' viewsheds. Alternative A would contribute the most to cumulative impacts because it would include the least protections of the routes' viewsheds.

### **3.20.4 Mormon Pioneer National Heritage Area (Boulder Loop and Under the Rim Districts)**

#### ***Affected Environment***

##### *Current Conditions*

Congress established the Mormon Pioneer National Heritage Area in 2006 to preserve “the rich heritage and tremendous achievements of the Mormon Pioneers.” In 2010, a management plan was finalized and has been used to fund restoration and revitalization projects in the heritage area (NPS 2010). Two of the five districts of the National Heritage Area are included in GSENM. The Boulder Loop District includes Scenic Byway 12 in the northern portion of GSENM, while the Under the Rim District includes U.S. Highway 89 in the southern portion of GSENM. Both districts and routes are shown on **Figure 3-42**, National Heritage Area, in **Appendix A**.

#### ***Environmental Consequences***

Refer to **Section F.28**, Special Designations – Mormon Pioneer National Heritage Area (Boulder Loop and Under the Rim Districts), in **Appendix F**, Analytical Framework, for descriptions of the indicators, analysis areas, and assumptions used for the following analysis.

##### *Issue*

- How would management impact the cultural, historic, and natural resources for which National Heritage Areas were designated?

##### *Impacts Common to All Alternatives*

No alternatives would alter the management of the designated Mormon Pioneer National Heritage Area. The BLM would continue to manage the area to protect the cultural, historic, and natural resources for which the area was designated. However, differences in VRM and ROW management across the alternatives could impact the area through management of visual and scenic resources viewable within the Mormon Pioneer National Heritage Area.

#### *Cumulative Impacts*

Due to the relatively small percentage of the Mormon Pioneer National Heritage Area that overlaps with GSENM, incremental impacts of implementing each alternative in this **Proposed RMP/Final EIS** would not impact the National Heritage Area or the values for which it was designated. Actions on BLM-managed lands would largely serve to protect the physical elements and scenic quality in the viewshed of the routes located within the two districts of the National Heritage Area.

### 3.20.5 Wild and Scenic Rivers

#### Affected Environment

##### Current Conditions

Beginning in 1994, BLM interdisciplinary teams gathered eligibility information regarding all river segments and watersheds in the Escalante and Kanab resource areas. In cooperation with the adjacent federal agencies, the eligibility study area was expanded during the development of the 2000 MMP (BLM 2000) to include river segments that extended into Dixie National Forest, Bryce Canyon National Park, and Glen Canyon. That way, the entire watersheds were evaluated for eligible segments. Eligible river segments are described in the 2000 Wild and Scenic Eligibility Findings and the GSENM Final EIS (BLM 2000, Appendix 4).

All streams determined eligible were then assessed for suitability as part of the 2000 MMP. In total, 252.2 miles of the Escalante and Paria River systems within the decision area were deemed suitable for inclusion in the National Wild and Scenic Rivers System. The BLM is managing these river corridors (0.25 miles above the mean high-water mark on either side of the river) to prevent degradation of the free-flowing condition, water quality, identified ORVs, and the tentative classification assigned to each segment (BLM 2000, Appendix 4). Management of these segments will continue as such until determinations on designation are made by Congress. Suitable river segments are identified in **Table 3-76** and **Figure 2-52**, Alternative A: Wild and Scenic Rivers, in **Appendix A**. Changed circumstances have not been identified since the original 2000 MMP eligibility and suitability studies. There are currently no congressionally designated WSRs within GSENM.

**Table 3-76. Suitable Wild and Scenic River Segments**

| Suitable Segment               | Tentative Classification | Length (miles) |
|--------------------------------|--------------------------|----------------|
| <b>Escalante River System</b>  |                          |                |
| Escalante River #1             | Wild                     | 13.8           |
| Escalante River #2             | Recreational             | 1.1            |
| Escalante River #3             | Wild                     | 19.2           |
| Harris Wash                    | Wild                     | 1.1            |
| Lower Boulder Creek            | Wild                     | 13.5           |
| Lower Deer Creek #1            | Recreational             | 3.8            |
| Lower Deer Creek #2            | Wild                     | 7.0            |
| Lower Sand Creek               | Wild                     | 10.6           |
| Mamie Creek and West Tributary | Wild                     | 9.2            |
| Slickrock Canyon               | Wild                     | 2.8            |
| Steep Creek                    | Wild                     | 6.4            |
| The Gulch #1                   | Wild                     | 11.0           |
| The Gulch #2                   | Recreational             | 0.6            |
| The Gulch #3                   | Wild                     | 13.0           |
| Willow Patch Creek             | Wild                     | 2.6            |
| Death Hollow Creek             | Wild                     | 9.9            |
| Calf Creek #1                  | Wild                     | 3.5            |
| Calf Creek #2                  | Scenic                   | 3.0            |
| Calf Creek #3                  | Recreational             | 1.5            |
| Twentyfive Mile Wash           | Wild                     | 6.8            |

| Suitable Segment          | Tentative Classification | Length (miles) |
|---------------------------|--------------------------|----------------|
| <b>Paria River System</b> |                          |                |
| Upper Paria River #1      | Wild                     | 21.7           |
| Upper Paria River #2      | Recreational             | 16.9           |
| Lower Paria River #1      | Recreational             | 3.3            |
| Lower Paria River #2      | Wild                     | 4.8            |
| Deer Canyon Creek         | Wild                     | 5.2            |
| Snake Creek               | Wild                     | 4.7            |
| Hogeye Creek              | Wild                     | 6.3            |
| Kitchen Canyon            | Wild                     | 1.3            |
| Starlight Canyon          | Wild                     | 4.9            |
| Lower Sheep Creek         | Wild                     | 1.5            |
| Hackberry Creek           | Wild                     | 20.1           |
| Lower Cottonwood Creek    | Recreational             | 2.9            |
| Buckskin Gulch/Wire Pass  | Wild                     | 18.0           |
| <b>Total</b>              |                          | <b>252.2</b>   |

Source: BLM 2000

Through this land use planning process, a recommendation package consisting of the suitability determinations will be provided to the U.S. Department of the Interior and Congress. Any determinations on WSR designation will be made through congressional action.

Short segments of Scorpion Gulch, Fools Canyon, Coyote Gulch, and Willow Gulch may occur on BLM-managed lands within GSENM. The NPS will manage these segments, and suitability recommendations will be made with the remainder of the named segments by Glen Canyon (BLM 2000, Appendix 4).

### **Environmental Consequences**

Refer to **Section F.29**, Special Designations – Wild and Scenic Rivers, in **Appendix F**, Analytical Framework, for descriptions of the indicators, analysis areas, and assumptions used for the following analysis.

#### *Issue*

- How would management affect the free-flowing condition, water quality, ORVs, and tentative classification of river segments found suitable for inclusion in the National Wild and Scenic Rivers System?

#### *Impacts Common to All Alternatives*

Across all alternatives, segments determined eligible or suitable for inclusion in the National Wild and Scenic Rivers System would be managed according to BLM Manual 6400 (BLM 2012b), **including their river corridors (0.25 miles above the mean high-water mark on either side of the river)**. Additionally, identified ORVs, free-flowing status, tentative classifications, and water quality would continue to be protected and managed for, pending congressional action.

#### *Alternative A*

Managing suitable segments (**Table 3-76**) would preserve their free-flowing condition, water quality, identified tentative classification, and ORVs. Suitable segments would be managed as ROW avoidance, except in designated utility corridors. Additionally, suitable segments within WSAs would be managed as

VRM Class I, which includes preserving the existing landscape character. This VRM class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention. More information on VRM Class I management can be found in **Section 3.10**, Visual Resources. Each suitable segment’s free-flowing condition, tentative classification, and ORVs would be retained.

Managing the eligible segments (Scorpion Gulch, Fools Canyon, Coyote Gulch, and Willow Gulch) would preserve their free-flowing condition, water quality, identified tentative classification, and ORVs until a determination of their suitability can be made with Glen Canyon.

*Alternative B*

Under Alternative B, the same 252.2 miles as under Alternative A would be suitable (**Table 3-77**). The only difference between Alternatives A and B is that, under Alternative B, the classifications of two suitable segments (Upper Paria River #1 and Lower Sheep Creek) would change from recreational to wild. This change would revert the segments to their original classifications, as determined in the 2000 MMP (BLM 2000). These segments and their changes are identified in **Table 3-77**. Suitable segments with wild classifications would be managed as ROW exclusion, and segments with scenic and recreational classifications would be managed as ROW avoidance, except in designated utility corridors. Segments with wild classifications and all suitable segments within WSAs would be managed as VRM Class I. These management actions would lead to a higher level of protection of visual and scenic resources within the designated wild corridors, compared with Alternative A. With the 23.2-mile increase of suitable segments classified as wild under Alternative B, more acreage and river miles would be protected from developments and ROWs than under Alternative A.

**Table 3-77. Suitable Wild and Scenic River Segment Changes under Alternative B**

| Suitable Segment          | Length (miles) | Tentative Classification under Alternative A | Tentative Classification under Alternative B |
|---------------------------|----------------|--|--|
| <b>Paria River System</b> |                |  |  |
| Upper Paria River #1      | 21.7           | Recreational                                 | Wild   |
| Lower Sheep Creek         | 1.5            | Recreational                                 | Wild   |
| <b>Total</b>              | <b>23.2</b>    |  |  |

Source: BLM GIS 2022

Under Alternative B, scenic or recreational segments outside of WSAs would be managed as ROW avoidance, except in designated utility corridors, and would be managed as VRM Class II. VRM Class II requires retaining the existing character of the landscape, meaning the level of landscape change is low. Additionally, management activities may be seen but should not attract the attention of the casual observer, and any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape. More information on VRM Class II management can be found in **Section 3.10**, Visual Resources. Compared with Alternative A, Alternative B would provide increased protection of visual and scenic resources throughout all suitable segments and corridors.

*Alternative C and E*

Under Alternatives C and E, classifications and miles of suitable segments, as well as assigned VRM classes, would be the same as under Alternative B. However, suitable segments with wild classifications would be

managed as ROW exclusion in the outback and primitive areas, and suitable segments with scenic and recreational classifications would be managed as ROW avoidance, except in designated utility corridors. The change in area managed as ROW exclusion within wild corridors would provide increased protections of visual and scenic resources, compared with Alternative A.

#### *Alternative D*

Under Alternative D, classifications and miles of suitable segments, as well as assigned VRM classes, would be the same as under Alternative B. However, suitable segments, regardless of classification, would be managed as ROW exclusion, except in designated utility corridors. The change in area managed as ROW exclusion would provide increased protection of visual and scenic resources, compared with Alternative A.

#### *Cumulative Impacts*

Past and present actions in the cumulative impacts analysis area affecting suitable WSRs include grazing, ROW development, recreation, and travel management. Impacts from such actions could affect the identified ORVs and tentative classification of segment corridors through surface disturbance and developments that would impact segments' free-flowing character and water quality.

Alternative D would provide the greatest protection of suitable WSR segments and would therefore contribute the least to overall cumulative impacts. Alternatives B, C, and E would provide more protection than Alternative A, which would provide the least protections of suitable segments and would therefore contribute the most to cumulative impacts.

Climate changes impacts could affect the identified ORVs through increased stream temperatures, increased severe wildland fire, degradation of vegetation resources, and impacts on scenery resources.

### **3.20.6 Wilderness Study Areas**

#### ***Affected Environment***

##### *Current Conditions*

Sixteen WSAs and ISAs are present in the decision area (**Figure 2-54**, Alternatives A, B, C, D, and E: Wilderness Study Areas, in **Appendix A**). A description of wilderness characteristics and other resource values and uses found in each WSA and ISA can be found in the Utah Statewide Wilderness Study Report (BLM 1991). These 16 WSAs and ISAs account for 881,100 acres (47 percent) of the decision area (**Table 3-78**).

**Table 3-78. Wilderness Study Areas and Instant Study Areas**

| <b>WSA/ISA Name</b>            | <b>Acres</b> |
|--------------------------------|--------------|
| Burning Hills WSA              | 62,500       |
| Carcass Canyon WSA             | 47,400       |
| Death Ridge WSA                | 62,400       |
| Devil's Garden ISA             | 600          |
| Escalante Canyons Tracts ISA   | 1,200        |
| Fiftymile Mountain WSA         | 148,500      |
| Mud Spring Canyon WSA          | 38,200       |
| North Escalante Canyons Tracts | 119,800      |
| I, 5 / The Gulch ISA           |              |

| <b>WSA/ISA Name</b>  | <b>Acres</b>   |
|--|----------------|
| Paria/Hackberry and<br><a href="#">Paria/Hackberry 202 WSA</a> | 137,200        |
| Phipps-Death Hollow ISA  | 42,700         |
| Scorpion WSA   | 36,000         |
| Steep Creek WSA  | 22,000         |
| The Blues WSA  | 18,800         |
| The Cockscomb WSA  | 9,900          |
| Wahweap WSA  | 133,900        |
| <b>Total</b>   | <b>881,100</b> |

Source: BLM GIS 2022 and [Utah Statewide Wilderness Study Report, October 1991](#).

#### *Trends*

Visitation to GSENM has steadily increased since the successful 2013 Mighty Five tourism campaign, which highlighted five national parks (Zion, Arches, Capital Reef, Canyonlands, and Bryce Canyon) surrounding GSENM. With visitation numbers increasing, threats to WSAs and ISAs include improper OHV usage, illegal incursions into WSAs and ISAs, campsite proliferation, trail widening or braiding, trash, soil and vegetation disturbance, and graffiti defacing WSA and ISA features.

#### *Forecasts*

WSAs are forecast to remain as currently designated and managed, pending congressional actions.

#### **Environmental Consequences**

Refer to **Section F.30**, Special Designations – Wilderness Study Areas, in **Appendix F**, Analytical Framework, for descriptions of the indicators, analysis areas, and assumptions used for the following analysis.

#### *Issue*

- [How would GSENM management affect the values and wilderness characteristics associated with WSAs?](#)

#### *Impacts Common to All Alternatives*

Under all alternatives, the 16 WSAs and ISAs would remain designated with no change to their size (**Table 3-78**). Subject to valid existing rights and grandfathered uses, WSAs and ISAs would continue to be managed as VRM Class I, ROW exclusion, and to prohibit off-route parking. Suitability of each designated WSA and ISA for wilderness designation would not be impacted or impaired (see **Section 3.10**, [Visual Resources](#), for additional information on VRM Class objectives across GSENM). OHV use across all alternatives would be limited to existing and designated routes. Alternative D would have the fewest acres of limited to existing and designated routes, with Alternative A having the highest (see **Section 3.18**, [Travel Management](#) for more details). Additionally, for all alternatives off-route parking or vehicle-based camping in WSAs would be prohibited.

#### *Alternative A*

If a WSA or ISA, in whole or in part, is released from wilderness consideration, the area would continue to be managed in accordance with the RMP goals, objectives, and management prescriptions, unless otherwise specified by Congress in its releasing legislation. [Goals include managing WSA and ISAs so that](#)



it does not impact or impair their suitability for designations as wilderness. Proposals for released areas would be examined on a case-by-case basis, but all actions that are inconsistent with RMP goals, objectives, and prescriptions would be deferred until an RMP amendment is completed. Wilderness characteristics inventories would not have to be completed prior to release. WSAs would be managed as OHV limited under Alternative A on approximately 1,864,000 acres, which could result in potential impacts to their wilderness characteristics. Only 100 acres under Alternative A would be open to OHV travel and not within WSA areas, where travel would be limited to designated routes. Approximately, 1500 acres would be closed to OHV travel (see **Section 3.18**, Travel Management for more information).

Under Alternative A, although there would continue to be 630,400 acres open to ROW authorization, 332,800 acres managed as ROW avoidance, and 21,100 as seasonal avoidance. 881,300 acres will be managed as ROW exclusion which includes all WSA/ISA areas. Under Alternative A, there would be no impacts on renewable energy and transmission line development and activity from BLM management decisions on ROW authorization. ROW actions near WSAs have the potential to affect wilderness character on those areas that have been previously inventoried (see **Section 3.19**, Land and Realty for more information).

Visual Resource management under alternative A would continue as stated in the 2020 RMP/EIS, all the acres for WSAs within GSENM under this alternative would fall under VRM Class I. For additional information on VRM acreage for alternative A within GSENM see **Section 3.10**, Visual Resources.

#### *Alternatives B, C, D, and E*

WSAs and ISAs would be managed so that if any were released from wilderness consideration, in whole or in part, past management of the released lands would continue, unless otherwise specified by Congress in its releasing legislation, in a manner that would ensure GSENM objects are protected. For the areas released from wilderness consideration and not designated as wilderness, re-inventories of wilderness characteristics would be required on released WSAs not designated as wilderness, and no proposals or actions would occur in those areas unless consistent with the protection of GSENM objects or for public health and safety. Furthermore, until inventories for wilderness characteristics are completed, and all steps necessary have been completed to establish management of the released areas moving forward, no proposal/actions will occur in the released areas unless consistent with, at a minimum, the protection wilderness characteristics and protection of GSENM objects, or for public health and safety. Compared with Alternative A, this would ensure that the current status of wilderness characteristics would be identified and that management of the released areas and any proposals or actions occurring in them would be consistent with the protection of GSENM objects, or for public health and safety. However, this could lead to impacts not protected under GSENM objects, such as surface disturbances impacting the naturalness and outstanding opportunities for solitude or primitive and unconfined types of recreation and supplemental values that would have previously been protected by WSA or ISA status.

WSAs would be managed as OHV closed under alternatives B, C, D, and E, limiting the potential for impacts to their wilderness characteristics. Other potential impacts would be within the acres of limited to existing and designated route areas under alternatives B, C, D, and E but would not be within identified WSA areas as directed.

Under alternatives B, C, D, and E, WSA management would fall under ROW exclusion acreage. This does not affect the designated corridors under each of the alternatives which would be 8,600 on 68-116 and

the Highway 89 energy corridor would be managed for 2,300 acres across all alternatives except alternative D would have 0 acres for the corridor 68-116.

WSA acres across GSENM would fall under VRM Class I and management would continue in a manner that does not impact or impair their suitability for designation as wilderness. For additional information on VRM acreage for the alternatives within GSENM see **Section 3.10**, Visual Resources.

#### *Cumulative Impacts*

Past and present actions in the cumulative impacts analysis area affecting WSA and ISA units and their associated wilderness characteristics include grazing, recreation, and travel management, as these can impact the naturalness and outstanding opportunities for primitive and unconfined recreation that make up these WSAs and ISAs eligible for wilderness designation. It is the BLM's policy not to establish new discretionary actions in WSAs that would impair the suitability of such areas for wilderness designation. However, management to the non-impairment standard does not mean that WSAs would be managed as though they had already been designated as wilderness. Some uses that could not take place in a designated wilderness study area may be permitted as described in BLM Manual 6330. For example, in some cases it is permissible for motorized vehicles to be used on some primitive routes in WSAs, which such vehicles are prohibited in designated wilderness under the Wilderness Act. Management actions to protect GSENM objects and would largely serve to protect the wilderness characteristics of these units, by reducing the chance of changes that would affect the area designations.

### **3.21 SOCIAL AND ECONOMIC VALUES**

The following subsections discuss current conditions, trends, and forecasts of socioeconomic values associated with uses of BLM-managed lands for the socioeconomic analysis area (Kane and Garfield Counties, Utah), and, where available, the decision area. The counties in the analysis area were chosen because GSENM is located in these counties, and any economic or social impacts from the BLM's management decisions would largely occur in these counties. The discussion focuses on information that is most relevant to the scope of the current BLM planning effort for GSENM.

#### **3.21.1 Affected Environment**

##### ***Current Conditions***

This section and **Appendix I, Section 1.21** provide a discussion on social and economic conditions within the socioeconomic analysis area. **Appendix I, Section 1.21** provides additional information and data, including current levels, trends, and forecasted data on local and regional demographics, communities of interest, economic indicators, and resource use and revenues on public lands.

Kane and Garfield Counties are among the most rural counties in Utah, and although the population in these counties have been increasing, the percent growth of population from 2000 to 2020 in Kane and Garfield Counties was smaller than the percent growth of population for Utah during the same period. Historically, Kane and Garfield Counties have predominately relied on farm and ranching, construction, and tourism and recreation-related industries for local employment, income, and economic output. Public lands, including in and around GSENM, provide lots of value to the local communities through providing access to recreation and forage for livestock, and providing local governments with distributions from tax revenues from mineral development. There are various social and geographic groups around GSENM that are affected by management of BLM-managed lands in varying ways, including residents, visitors, commercial users, traditional or subsistence users, tribes, and interest-based or place-based groups,

among others. These groups have distinct sets of attitudes, beliefs, values, opinions, and perceptions about BLM-managed public resources and the effects of various management policies and actions, which are often based on different cultural and economic linkages that people have with BLM-managed lands. See [Appendix I, Section I.2I](#) for more details on social and economic conditions.

### 3.21.2 Environmental Consequences

Refer to **Section F.32**, Social and Economic Values, in **Appendix F**, Analytical Framework, for descriptions of the indicators, analysis areas, and assumptions used for the following analysis.

#### Issues

- How would BLM management actions impact local and regional economic interests and conditions?
- How would BLM management actions impact social conditions and values of communities?

#### Analytical Methods and Assumptions

##### *Local and Regional Economic Interests and Conditions*

The economic values from resource management decisions were calculated using the Impact Analysis for Planning Model (IMPLAN), an input-output model that tracks inter-industry and consumer spending in a local or regional economy; this allows estimation of indirect and induced economic impacts from a one-time direct change to the economy due to increases or decreases in expenditures, employment, or income. Indirect impacts result from the inter-industry transactions (for example, when a recreation outfitter buys supplies from a local grocery store). Induced impacts result from re-spending of household income (for example, when employees of the recreation outfitter buy goods for personal use at a local grocery store). The outputs calculated from IMPLAN include gross regional economic output, value added, employment, and labor income.

Recreation and livestock grazing and ranching are some of the most important industries within the planning area, so the economic contributions analysis focused on impacts from the BLM's management decisions on these resource uses. The modeled direct impacts were calculated from estimated recreation expenditures per visitor party and economic value from grazing per billed AUM. These impacts were then multiplied by the projected number of visitor parties and projected billed AUMs to calculate the total direct impacts from the BLM's management in GSENM.

Recreation expenditures are calculated based on the number of visitors to GSENM for each type of visit, the number of people in the party, and the amount of spending per party for each visit type and type of expense (White 2017, 2022). **Table 3-79** shows the estimated number of annual visitors in GSENM by type for Alternative A. The [estimated](#) total number of visitors in 2022, under Alternatives A, was [calculated](#) by multiplying the number of visitors in 2021 by the average annual growth rate in visitors from 2010 to 2021 (7.7 percent). Economic impacts from changes in recreation under Alternatives B, C, D, and E are discussed qualitatively with respect to differences from Alternative A.

Nonlocal visitors are those who travel 50 miles or more from home to the destination, and local visitors are those who travel less than 50 miles to the destination. Visitors who stay overnight in GSENM might camp in a designated campsite or disperse camp, whereas visitors who stay overnight off GSENM might stay at a hotel in a community nearby. Non-primary visitors are people who visited GSENM, but GSENM was not their primary purpose for being in the area.

**Table 3-79. Estimated Number of Visitors by Visit Type in GSENM under Alternative A (2022)**

| Visit Type                           | Number of Visitors |
|--------------------------------------|--------------------|
| Nonlocal day trip                    | 9,309              |
| Nonlocal overnight staying in GSENM  | 232,736            |
| Nonlocal overnight staying off GSENM | 688,899            |
| Local day trip                       | 14,396             |
| Local overnight staying in GSENM     | 7,198              |
| Local overnight staying off GSENM    | 7,198              |
| Not primary                          | 516,781            |
| <b>Total</b>                         | <b>1,476,518</b>   |

Source: BLM 2022

Notes: The totals in the table may not exactly equal the sum of the line items above due to rounding.

**Table 3-80** shows the spending patterns per party based on the visit type and type of expenditures.<sup>18</sup> A party of nonlocal visitors staying overnight off GSENM tends to spend more on expenses such as hotels, restaurants, entry fees, recreation and entertainment, souvenirs, and other expenses than a party of nonlocal visitors staying in GSENM. Local visitor parties tend to spend less overall than nonlocal visitor parties.

**Table 3-80. Spending Profile per Party by Visit Type (2022\$)**

| Type of Expenditure           | Nonlocal Day Trip | Nonlocal Overnight Staying in GSENM | Nonlocal Overnight Staying off GSENM | Local Day Trip | Local Overnight Staying in GSENM | Local Overnight Staying off GSENM | Not Primary |
|-------------------------------|-------------------|-------------------------------------|--------------------------------------|----------------|----------------------------------|-----------------------------------|-------------|
| Hotel/motel/bed and breakfast | 0.00              | 0.00                                | 294.39                               | 0.00           | 0.00                             | 90.92                             | 203.76      |
| Camping                       | 0.00              | 36.54                               | 22.23                                | 0.00           | 26.39                            | 18.73                             | 16.65       |
| Restaurant                    | 21.93             | 35.78                               | 159.33                               | 7.98           | 13.15                            | 58.36                             | 140.28      |
| Groceries                     | 11.61             | 63.62                               | 83.41                                | 7.04           | 77.44                            | 60.80                             | 61.04       |
| Gas and oil                   | 30.08             | 68.22                               | 88.18                                | 13.99          | 47.26                            | 60.14                             | 61.59       |
| Other transportation          | 0.55              | 4.77                                | 6.10                                 | 0.13           | 4.75                             | 6.29                              | 5.66        |
| Entry fees                    | 4.37              | 6.82                                | 16.44                                | 2.95           | 6.44                             | 7.53                              | 11.50       |
| Recreation and entertainment  | 3.95              | 9.35                                | 27.66                                | 1.43           | 2.58                             | 9.14                              | 25.86       |
| Sporting goods                | 3.49              | 12.82                               | 13.78                                | 3.61           | 11.62                            | 12.08                             | 9.14        |
| Souvenirs and other expenses  | 2.91              | 9.74                                | 27.67                                | 0.78           | 2.33                             | 7.48                              | 27.84       |

Source: White 2017, 2022

The economic value of livestock grazing was calculated based on the average value of cattle production per AUM, over 10 years (White 2017, 2022). **Table 3-81** shows the value of production per cow, AUMs per cow, and adjusted value of production per AUM. The 10-year average value of production per AUM (in 2021\$) was approximately \$52.69. **Table 3-82** shows the number of currently permitted AUMs (106,202), billed AUMs (76,957), and the calculated percentage of billed AUMs to permitted AUMs (72 percent), as well as the available AUMs and estimated projected billed AUMs for each alternative. The estimated projected number of billed AUMs was calculated by multiplying the percentage of current billed AUMs to permitted AUMs (72 percent) by the available AUMs for each alternative.

<sup>18</sup> On average, a party size is about 2.44 visitors (White 2017, 2022).

**Table 3-81. Value of Production for Grazing**

| Year            | Value of Production per Cow (Nominal \$) | AUMs per Cow | Adjusted Value of Production per AUM (2021\$) |
|-----------------|--|--------------|---|
| 2012            | 744.93                                   | 16           | 52.39   |
| 2013            | 780.50                                   | 16           | 56.46   |
| 2014            | 1,076.00                                 | 16           | 93.34   |
| 2015            | 1,015.79                                 | 16           | 81.00   |
| 2016            | 704.62                                   | 16           | 46.84   |
| 2017            | 710.20                                   | 16           | 48.46   |
| 2018            | 589.29                                   | 16           | 38.75   |
| 2019            | 558.00                                   | 16           | 36.69   |
| 2020            | 565.77                                   | 16           | 35.06   |
| 2021            | 606.07                                   | 16           | 37.88   |
| 10 Year Average | 735.12                                   | 16           | 52.69   |

Source: U.S. Department of Agriculture, Economic Research Service 2022; White 2017, 2022; IMPLAN 2022

**Table 3-82. Number of Permitted, Billed, Available, and Projected Billed AUMs**

| Alternative                | Permitted AUMs | Billed AUMs | Percentage of Billed AUMs to Permitted AUMs | Available AUMs | Estimated Projected Billed AUMs <sup>1</sup> |
|----------------------------|----------------|-------------|---|----------------|--|
| Current                    | 106,202        | 76,957      | 72%   | 107,995        | —  |
| Alternative A <sup>2</sup> | —              | —           | —   | 107,995        | 78,256                                       |
| Alternative B              | —              | —           | —   | 105,034        | 76,111                                       |
| Alternative C              | —              | —           | —   | 105,034        | 76,111                                       |
| Alternative D              | —              | —           | —   | 45,248         | 32,788                                       |
| Alternative E              | —              | —           | —   | 104,980        | 76,072                                       |

— = Not available

<sup>1</sup> Calculated based on the available AUMs for each alternative multiplied by the current percentage of billed AUMs to permitted AUMs. Voluntary relinquishments of grazing permits would decrease this amount across all alternatives.

<sup>2</sup>To account for the additional AUMs the BLM has been instructed to permit, as part of the 2020 KEPA RMP, Alternative A assumes that there will be additional projected billed AUMs (BLM 2020). The total estimated projected billed AUMs under Alternative A are calculated using the same approach as the estimated projected billed AUMs under Alternatives B, C, and D (by multiplying the percentage of current billed AUMs to permitted AUMs and the total available AUMs).

### *Social Conditions and Community Values*

There are many other values not captured from economic contributions, such as values from access to products, education, public health and safety, visitor or viewer enjoyment, way of life or culture, social cohesion, and ecosystem values. These values are often called nonmarket values, which are the benefits that individuals attribute to experiences of the environment or uses of natural and cultural resources that do not involve market transactions and, therefore, lack prices. There are many types of nonmarket values. Three nonmarket values are considered in the analysis: 1) the benefits to local communities from the amenity values provided by open space and scenic landscapes; 2) the benefits to individuals, such as the value to recreationists and visitors above and beyond the cost that they pay to recreate; and 3) ecosystem service values, which refer to the ways that healthy ecosystems support, enable, or protect human activity.

In examining nonmarket values, economists often distinguish between “use values” and “nonuse values.” A use value refers to the benefits an individual derives from some direct experience or activity, such as

climbing a spectacular peak, hunting, or viewing wildlife. In contrast, a nonuse value refers to the utility or psychological benefit some people derive from the existence of some environmental condition that may never be directly experienced, such as an unspoiled landscape or the continued presence of an endangered species. Estimating nonuse values for specific resources is difficult and often controversial. The BLM guidance recommends that use values be emphasized rather than nonuse values (BLM 2013).

Nonmarket values are important to consider because they help tell the entire socioeconomic story. Estimates of nonmarket values supplement estimates of income generated from commodity uses to provide a more complete picture of the economic implications of proposed resource management decisions. It is difficult to put a dollar number on those values, but the correct answer is not “zero,” so it is important to consider these values. In the following analysis, nonmarket values are discussed qualitatively, and when information is available, examples of these values in analogous situations are provided.

Proximity to open spaces can affect property values. This analysis will use literature to examine the economic benefits to local economies from this proximity to open spaces. Economic benefits to individuals will be measured using consumer surplus values to calculate the value of GSENM to recreationists and visitors. Consumer surplus is defined as the maximum dollar amount, above any actual payments made, that a consumer would be willing to pay to enjoy a good or service. For instance, hikers pay a market price for gasoline used to reach a trail but pay nothing to use the trail. Any amount that a recreationist would be willing to pay to use this otherwise free resource represents the nonmarket consumer surplus value of that resource to that consumer.

A 2016 report summarized the findings of consumer surplus values per person per day by recreational activity from 421 studies (totaling 3,192 different value estimates) covering the United States and Canada from 1958 to 2015 (Rosenberger 2016). These values, or a range of values from specific individual studies that are most comparable to the decision area, will be applied to recreational usage figures (for example, visitor days) to estimate the recreation-related nonmarket use value—the consumer surplus—for the decision area. Economic benefits from ecosystem services will be examined by providing an inventory of the ecosystem benefits from GSENM, including any applicable benefits from potable water from groundwater recharge, flood control from intact wetlands, and carbon sequestration from healthy forests and certain agricultural lands.

### ***Impacts Common to All Alternatives***

#### *Local and Regional Economic Interests and Conditions*

Under all alternatives, GSENM would provide value to the local and regional economy by providing recreational opportunities and grazing and ranching allotments. This value is realized through local jobs, wages, and economic output. As the population in the analysis area is expected to continue to increase in the future, the local jobs, labor income, and economic output that are provided in GSENM are increasingly important to the communities.

#### *Social Conditions and Community Values*

Under all alternatives, the open space provides many benefits to the surrounding communities, such as increasing quality of life through visual resources, access to products and resources, fresh water, and air quality; waste regulation; biodiversity maintenance; soil formation; protection from natural hazards; and **outstanding** opportunities for solitude and spiritual connection to the landscape. Although the value of

these benefits cannot be quantified through market mechanisms, estimates of some of the value can be obtained through measures like property values and recreation consumer surplus.

Many studies have found a positive relationship between proximity to a park or open space and a premium on property sale price. The premium could be as high as 8 to 10 percent on property sale prices that are adjacent to parks or open spaces. Furthermore, there tends to be a higher value placed on properties near open spaces that are protected from development than properties near open spaces that could be developed in the future (Crompton and Nicholls 2020).

Under all alternatives, the BLM's management decisions provide nonmarket benefits to the community through recreation, such as enjoyment from recreating on open spaces and viewing landscapes, improved mental and physical health and reduced potential health costs through increased exercise and environmental and air quality, social cohesion, and increased way-of-life benefits through providing opportunities for intergenerational land uses and practices. These nonmarket benefits are difficult to quantify because they are above and beyond the values captured through what visitors pay to recreate (that is, lodging expenses, entrance fees, equipment rentals or purchases, etc.). **Table 3-83** shows estimated average consumer surplus values for recreational use (which are the values above what recreators pay; they capture what recreators would be willing to pay) by primary activity in the Forest Service Intermountain Region, which is the closest Forest Service region to GSENM and the conclusions of which can be applied to GSENM. The activities with the highest consumer surplus are nonmotorized boating, biking, and hiking. Under all alternatives, these recreational benefits, to the extent they occur in the analysis area, would continue to provide value to the local and nonlocal visitors. See **Section 3.17**, Recreation, for more information.

**Table 3-83. Estimates of the Average Consumer Surplus of Recreational Benefits for the Intermountain Region, per Person per Primary Activity Day**

| Primary Activity     | Average Consumer Surplus (\$) |
|----------------------|-------------------------------|
| Backpacking          | 42.81                         |
| Biking               | 96.40                         |
| Cross-country skiing | 66.18                         |
| Developed camping    | 45.27                         |
| Downhill skiing      | 91.88                         |
| Fishing              | 81.18                         |
| Hiking               | 94.12                         |
| Hunting              | 87.07                         |
| Motorized boating    | 68.03                         |
| Nature related       | 69.79                         |
| Nonmotorized boating | 118.59                        |
| OHV use/snowmobiling | 60.11                         |
| Other recreation     | 74.66                         |
| Picnicking           | 58.83                         |
| Weighted average     | 77.04                         |

Source: Rosenberger et al. 2017

Recreation values are sometimes in opposition to other nonmarket values, and recreation could lead to potentially negative impacts on the surrounding communities. These impacts could include adverse impacts on nonmarket values to open spaces (through crowding and congestion), reduced quality of life (through

increased traffic or conflicts with livestock grazing), and increased risk of destruction or disturbance to traditional values and cultural resources. Under all alternatives, these impacts could continue to affect the communities in the analysis area.

Grazing and ranching are an important resource to communities by providing a sense of place, sustaining rural lifestyles, passing on traditions and practices to future generations, and increasing the quality of life of those ranching and farming community members. Many farmers and ranchers dedicate their entire working lives to the practice. The resources that GSENM provides, under all alternatives, often support the livelihoods of these community members and their families. See **Section 3.16**, Livestock Grazing, for more information.

The BLM’s management decisions regarding fire and fuels management aim to provide for resilient and resistant landscapes, protecting fire-adapted communities by reducing the fire hazard, especially within wildland-urban interface areas, and improving safe and effective wildfire response. Under all alternatives, the BLM will continue to provide these nonmarket benefits that will support safety and increase visual scenery, which can increase quality of life throughout the community. See **Section 3.13**, Fire and Fuels Management, for more information.

Ecosystem services are commonly subdivided into four categories, according to the type of benefit provided (World Resources Institute 2005): provisioning services, regulating services, cultural or information services, and supporting services. Provisioning services are products directly obtained from ecosystem services for basic human needs, such as food, water, minerals, shelter, and fuel. Regulating services maintain water and air quality; these services include flood regulation and carbon sequestration. Supporting services maintain habitats for wildlife and include nutrient cycling and biodiversity. Cultural and information services relate to aesthetic values, recreational opportunities, and spiritual uses.

Ecosystem goods and services in the analysis area are associated with three main resources (rangelands, recreation, and water), as identified in **Table 3-84**. Although the listed resources and their associated human benefits represent key areas of importance for GSENM management, this list is not inclusive of all goods and services provided in GSENM. See **Section 3.4**, Water Resources, **Section 3.16**, Livestock Grazing, and **Section 3.17**, Recreation, for more details.

**Table 3-84. Ecosystem Goods and Services in the Analysis Area, by Benefit**

| Provisioning  | Supporting/Regulating<br>Rangeland   | Cultural/Information  |
|---|--|---|
| <ul style="list-style-type: none"> <li>• Domestic livestock production</li> <li>• Other food for human consumption</li> <li>• Forage for livestock</li> <li>• Water for downstream economic uses</li> </ul> | <ul style="list-style-type: none"> <li>• Clean drinking water</li> <li>• Wildlife habitat benefits (hunting, viewing, existence value, etc.)</li> <li>• Floods for channel and riparian area rejuvenation</li> <li>• Flood mitigation</li> <li>• Minimization of soil erosion and downwind/downstream soil deposition</li> <li>• Contribution to clean, fresh air</li> <li>• Carbon sequestration</li> </ul> | <ul style="list-style-type: none"> <li>• Scenic views</li> <li>• Support for traditional agrarian lifestyle</li> <li>• Historic and archaeological sites</li> <li>• Recreation and tourism sites</li> </ul> |



| Provisioning  | Supporting/Regulating   | Cultural/Information  |
|---|---|---|
| <b>Water Resources</b>  |   |   |
| <ul style="list-style-type: none"> <li>• Irrigation water</li> <li>• Domestic water</li> <li>• Water for livestock</li> </ul> | <ul style="list-style-type: none"> <li>• Floods for channel and riparian area rejuvenation</li> <li>• Groundwater recharge</li> </ul> | <ul style="list-style-type: none"> <li>• Support for traditional lifestyle</li> </ul>   |
| <b>Recreation</b>   |   |   |
| <ul style="list-style-type: none"> <li>• Access to hunting for food for human consumption</li> </ul>                          | <ul style="list-style-type: none"> <li>• Promotion of public lands stewardship</li> </ul>   | <ul style="list-style-type: none"> <li>• Support for mental and physical health</li> <li>• Scenic resources</li> <li>• Opportunities for family/multigenerational connection</li> </ul> |

**Alternative A**

*Local and Regional Economic Interests and Conditions*

From 2010 to 2021, visitor numbers at GSENM increased from 742,586 to 1,371,036, which is approximately 7.7 percent per year, on average (BLM 2022a). Visitors to GSENM are expected to increase as area population increases, outdoor recreation becomes more popular, and GSENM becomes more well known. Under Alternative A, there would be no change to acres available or closed to recreation, but the trend in number of visitor is expected to continue. The projected number of visitor parties is estimated to be approximately 1,476,518 visitors (calculated from the visitor number in 2021 multiplied by the 7.7 annual growth rate), which would be 605,905 parties. Under Alternative A, this could result in the continued economic contributions of approximately 3,700 employees, \$123 million in labor income, and \$386 million in economic output (see **Table 3-85**).

Under Alternative A, there would be no change to the number of available allotments. However, as noted above, under Alternative A, the BLM would have the potential to permit the additional available allotments. If approximately 72 percent of these permitted AUMs are used and billed (which is the current percentage of billed AUMs to permitted AUMs), there could be an increase in estimated billed AUMs of almost 1,300 billed AUMs from current billed AUMs (see **Table 3-82**). Under Alternative A, the economic contribution from approximately 78,256 estimated billed AUMs could result in approximately 51 total jobs, \$2 million in labor income, \$2.5 million in value added, and \$6.8 million in economic output (see **Table 3-86**).

**Table 3-85. Economic Contributions for Recreation from estimated Visitation under Alternative A (2023\$)**

| Impact             | Employment                     |       | Labor Income (\$000)           |         | Value Added (\$000)            |         | Output (\$000)                 |         |
|--------------------|--------------------------------|-------|--------------------------------|---------|--------------------------------|---------|--------------------------------|---------|
|                    | Per 1,000 Parties <sup>1</sup> | Total | Per 1,000 Parties <sup>1</sup> | Total   | Per 1,000 Parties <sup>1</sup> | Total   | Per 1,000 Parties <sup>1</sup> | Total   |
| Direct             | 4.99                           | 3,026 | 165                            | 100,058 | 264                            | 159,904 | 458                            | 277,364 |
| Indirect           | 0.70                           | 423   | 23                             | 14,147  | 44                             | 26,399  | 115                            | 69,601  |
| Induced            | 0.42                           | 252   | 14                             | 8,323   | 34                             | 20,727  | 64                             | 39,034  |
| Total <sup>2</sup> | 6.11                           | 3,700 | 202                            | 122,528 | 342                            | 207,029 | 637                            | 386,000 |

Source: IMPLAN 2023

<sup>1</sup>Economic contribution results from IMPLAN modeling are linear, so a 10 percent change in the number of estimated recreation parties (assuming the proportion of visitors by visitor type is held constant), for example, would equal a 10 percent change in economic contributions. If readers have their own estimates for number of recreation parties to GSENM, they can also calculate the total economic contributions from recreation by multiplying their recreation party estimates by the per 1,000 party multipliers in the table above.

<sup>2</sup>Totals may not exactly equal the sum of the impacts above due to rounding.

**Table 3-86. Economic Contributions for Grazing under Alternative A (2023\$)**

| Impact             | Employment                 |       | Labor Income (\$)          |           | Value Added (\$)           |           | Output (\$)                |           |
|--------------------|----------------------------|-------|----------------------------|-----------|----------------------------|-----------|----------------------------|-----------|
|                    | Per 1000 AUMs <sup>1</sup> | Total | Per 1000 AUMs <sup>1</sup> | Total     | Per 1000 AUMs <sup>1</sup> | Total     | Per 1000 AUMs <sup>1</sup> | Total     |
| Direct             | 0.42                       | 33    | 17,235                     | 1,348,768 | 19,141                     | 1,497,898 | 53,595                     | 4,194,107 |
| Indirect           | 0.17                       | 13    | 5,871                      | 459,456   | 7,808                      | 611,063   | 23,305                     | 1,823,789 |
| Induced            | 0.06                       | 5     | 2,024                      | 158,418   | 5,091                      | 398,419   | 9,548                      | 747,218   |
| Total <sup>2</sup> | 0.66                       | 51    | 25,131                     | 1,966,642 | 32,041                     | 2,507,380 | 86,448                     | 6,765,114 |

Source: IMPLAN 2023

<sup>1</sup>Economic contribution results from IMPLAN modeling are linear, so a 10 percent change in billed AUMs, for example, would equal a 10 percent change in economic contributions. Total economic contributions from grazing could also be calculated by multiplying an estimated number of billed AUMs by the per 1,000 AUM multipliers, in the table above.

<sup>2</sup>Totals may not exactly equal the sum of the impacts above due to rounding.

The economic contributions from tax revenue-generating activities like recreation and tourism would likely continue to help support public services in the region, such as education and transportation.

It should be noted that the total economic contributions does not encompass the complete value of grazing to the local economy. There are nonmarket values associated with grazing, such as way-of-life values, that are not reflected in these numbers, as discussed in the section below.

Under Alternative A, there would continue to be 630,400 acres open to ROW authorization, 332,800 acres managed as ROW avoidance and 881,300 acres managed as ROW exclusion. Under Alternative A, there would be no impacts on renewable energy and transmission line development and activity from BLM management decisions on ROW authorization.

#### *Social Conditions and Community Values*

Under Alternative A, the nonmarket benefits and ecosystem services provided by the BLM's management decisions in the analysis area would continue. Under Alternative A, there would continue to the same number of acres managed as limited OHV travel, so there would continue to be access to products and resources.

There would continue to be no acres managed to protect or minimize lands with wilderness characteristics under Alternative A. This means there would likely continue to be impacts on the benefits and values associated with protected open space. There could be reductions in values associated with conservation of ecosystems for future generations, and the benefits associated with the ecosystem services provided on protected open space—some of which are listed in **Table 3-84**—would likely not be as big, due to the lack of protection for lands with wilderness characteristics. Additionally, there could be reductions in values associated with way of life and quality of life, visual and sound resources, environmental and air quality, and preservation of cultural and historical knowledge.

On the other hand, the benefits associated with recreation, such as impacts on mental and physical health and visitor and viewer enjoyment from recreation, would continue under Alternative A, due to continued availability of areas for recreational uses. This increase in recreational value could lead to reduced social cohesion, if there are increase in conflicts among different user groups, such as recreationists and local ranchers.

**Alternative B**

*Local and Regional Economic Interests and Conditions*

Under Alternative B, the acreage managed as SRMAs, ERMAs, and RMZs would be very similar to under Alternative A. However, there would be more areas closed to OHV travel and more lands managed to protect wilderness characteristics, and when considered collectively, these management decisions could limit SRPs and certain recreational activities more than under Alternative A. These limitations could lead to fewer visitors and less recreational expenditures, under Alternative B, compared with Alternative A, which would likely lead to a reduction in economic contributions from recreation, such as a loss in jobs, labor income, and economic output (see Section 3.16, Recreation, for more information on impacts on recreation and visitors).<sup>19</sup> Limitations on SRPs could negatively impact local businesses, and could potentially lead to businesses laying off workers or closing completely, which would impact the communities in the surrounding region, especially those that rely on recreation and tourism to support the economy.

The grazing allotments that would be eliminated under Alternative B are not currently being held, so there would likely be no economic impact under Alternative B, compared with current permits and current AUMs. However, there could be economic impacts if the allotments that are not currently being held are expected to be permitted, as was requested of the BLM in the 2020 KEPA RMP (BLM 2020) and as discussed in the impacts under Alternative A. Under Alternative B, the number of estimated projected billed AUMs would likely decrease by over 2,000, compared with the estimated projected billed AUMs under Alternative A, which includes billed AUMs from the potential permits that are not currently being held (**Table 3-82**). Under Alternative B, the economic output for grazing could be approximately \$6.6 million, which would be approximately \$185,000 less in output than under Alternative A. Under Alternative B, the number of employees and labor income attributed to the BLM’s management decisions about grazing could be approximately 50 employees and \$1.9 million, respectively, which is approximately 1 job fewer and \$54,000 less than under Alternative A (see **Table 3-87**).

**Table 3-87. Economic Contributions for Grazing under Alternative B (2023\$)**

| Impact             | Employment                 |       | Labor Income (\$)          |           | Value Added (\$)           |           | Output (\$)                |           |
|--------------------|----------------------------|-------|----------------------------|-----------|----------------------------|-----------|----------------------------|-----------|
|                    | Per 1000 AUMs <sup>1</sup> | Total | Per 1000 AUMs <sup>1</sup> | Total     | Per 1000 AUMs <sup>1</sup> | Total     | Per 1000 AUMs <sup>1</sup> | Total     |
| Direct             | 0.42                       | 32    | 17,235                     | 1,311,788 | 19,141                     | 1,456,829 | 53,595                     | 4,079,113 |
| Indirect           | 0.17                       | 13    | 5,871                      | 446,859   | 7,808                      | 594,309   | 23,305                     | 1,773,785 |
| Induced            | 0.06                       | 5     | 2,024                      | 154,075   | 5,091                      | 387,495   | 9,548                      | 726,731   |
| Total <sup>2</sup> | 0.66                       | 50    | 25,131                     | 1,912,721 | 32,041                     | 2,438,633 | 86,448                     | 6,579,628 |

Source: IMPLAN 2023

<sup>1</sup>Economic contribution results from IMPLAN modeling are linear, so a 10 percent change in billed AUMs, for example, would equal a 10 percent change in economic contributions. Total economic contributions from grazing could also be calculated by multiplying an estimated number of billed AUMS by the per 1,000 party multipliers, in the tables above.

<sup>2</sup>Totals may not exactly equal the sum of the impacts above due to rounding.

<sup>19</sup> Economic contribution results from IMPLAN modeling are linear, so if new estimates in number of visitors were calculated based on new information, economic contributions from these new estimates could be calculated based on the percent change in inputs. For example, a 10 percent change in the number of estimated recreation parties (assuming the proportion of visitors by visitor type is held constant) would equal a 10 percent change in economic impacts. If readers have their own estimates for number of recreation parties to GSENM, they can also calculate the total economic contributions from recreation by multiplying their recreation party estimates by the per 1,000 party multipliers in the table above.

Impacts on public services and infrastructure, due to economic contributions from tax revenue-generating activities, would likely be similar to Alternative A and would be minimal.

Under Alternative B, there would be a reduction in land managed as open to ROW authorization by about 545,300 acres, compared with Alternative A. However, there would also be a reduction in land managed as ROW exclusion, and there would be an increase in land managed as ROW avoidance. The decrease in land managed as open to ROW authorization could lead to an increase in cost associated with development of transmission lines or renewable energy. These increases in cost could result in an increase in rates for energy to the surrounding communities or could lead to barriers or delays in development of important energy infrastructure.

#### *Social Conditions and Community Values*

Under Alternative B, there would be an increase in areas closed to OHV travel, compared with Alternative A, to over 950,000 acres. This could limit access to products and resources, including cultural and subsistence resources.

Under Alternative B, the acres managed to protect lands with wilderness characteristics would increase by 72,000, compared with under Alternative A. This could increase the overall value of nonmarket benefits provided through protected open space, compared with Alternative A. These increased benefits include values associated with conservation of ecosystems for future generations, ecosystem services provided on protected open space, way of life and sustaining lifestyles near open spaces, environmental and air quality, preservation of cultural and historical knowledge, and visual and sound resources. The benefits from these values would likely be greater under Alternative B than under Alternative A.

Under Alternative B, there would continue to be 487,600 acres of land managed for other discretionary actions, so, while there would likely continue to be nonmarket benefits associated with recreation, visitors would be directed to recreate in more populated areas, potentially leading to issues of crowding and impacts on social cohesion. This could reduce the nonmarket values associated with recreation compared with Alternative A, such as mental and physical health and visitor and viewer enjoyment from recreation.

### **Alternative C**

#### *Local and Regional Economic Interests and Conditions*

Under Alternative C, the BLM would designate more SRMAs and fewer ERMAs than under Alternative A. There would be more areas closed to OHV travel and more lands managed to protect wilderness characteristics. These management decisions, when considered collectively, would limit SRPs and certain recreational activities more than under Alternative A. If these management actions lead to fewer visitors and less recreational expenditures, under Alternative C, compared with Alternative A and B, then there would likely be a reduction in economic contributions from recreation, such as a loss in jobs, labor income, and economic output (see **Section 3.17**, Recreation, for more information on impacts on recreation and

visitors).<sup>20</sup> Limitations on SRPs could negatively impact local businesses, and could potentially lead to businesses laying off workers or closing completely, which would impact the communities in the surrounding region, especially those that rely on recreation and tourism to support the economy.

Under Alternative C, the estimated number of billed AUMs could be over 2,100 AUMs less than under Alternative A (see **Table 3-82**). This reduction in AUMs would likely result in a decrease in economic contributions from grazing under Alternative C, compared with Alternative A. Under Alternative C, the economic output for grazing could be approximately \$6.6 million, which would be approximately \$185,000 less in output than under Alternative A. Under Alternative C, the number of employees and labor income attributed to the BLM's management decisions for grazing could be approximately 50 employees and \$1.9 million, respectively, which is approximately 1 jobs fewer and \$54,000 less in labor income than under Alternative A (see **Table 3-88**).

Impacts on public services and infrastructure, due to economic contributions from tax revenue-generating activities, would likely be minimal, similar to Alternative A.

**Table 3-88. Economic Contributions for Grazing under Alternative C (2023\$)**

| Impact             | Employment                 |       | Labor Income (\$)          |           | Value Added (\$)           |           | Output (\$)                |           |
|--------------------|----------------------------|-------|----------------------------|-----------|----------------------------|-----------|----------------------------|-----------|
|                    | Per 1000 AUMs <sup>1</sup> | Total | Per 1000 AUMs <sup>1</sup> | Total     | Per 1000 AUMs <sup>1</sup> | Total     | Per 1000 AUMs <sup>1</sup> | Total     |
| Direct             | 0.42                       | 32    | 17,235                     | 1,311,788 | 19,141                     | 1,456,829 | 53,595                     | 4,079,113 |
| Indirect           | 0.17                       | 13    | 5,871                      | 446,859   | 7,808                      | 594,309   | 23,305                     | 1,773,785 |
| Induced            | 0.06                       | 5     | 2,024                      | 154,075   | 5,091                      | 387,495   | 9,548                      | 726,731   |
| Total <sup>2</sup> | 0.66                       | 50    | 25,131                     | 1,912,721 | 32,041                     | 2,438,633 | 86,448                     | 6,579,628 |

Source: IMPLAN 2023

<sup>1</sup>Economic contribution results from IMPLAN modeling are linear, so a 10 percent change in billed AUMs, for example, would equal a 10 percent change in economic contributions. Total economic contributions from grazing could also be calculated by multiplying an estimated number of billed AUMs by the per 1,000 party multipliers, in the table above.

<sup>2</sup>Totals may not exactly equal the sum of the impacts above due to rounding.

Under Alternative C, there would be a reduction in land managed as open to ROW authorization by about 640,600 acres, compared with Alternative A. There would be an increase in land managed as ROW exclusion and land managed as ROW avoidance of 29,900 acres and 610,700 acres, respectively. Similar to Alternative B, the decrease in land managed as open to ROW authorization could lead to an increase in cost associated with development of transmission lines or renewable energy, which could result in an increase in energy rates or lead to barriers or delays in development. The impacts would be greater under Alternative C than under Alternative B due to the larger number of acres managed as ROW exclusion under Alternative C.

<sup>20</sup> Economic contribution results from IMPLAN modeling are linear, so if new estimates in number of visitors were calculated based on new information, economic contributions from these new estimates could be calculated based on the percent change in inputs. For example, a 10 percent change in the number of estimated recreation parties (assuming the proportion of visitors by visitor type is held constant) would equal a 10 percent change in economic impacts. If readers have their own estimates for number of recreation parties to GSENM, they can also calculate the total economic contributions from recreation by multiplying their recreation party estimates by the per 1,000 party multipliers in the table above.

#### *Social Conditions and Community Values*

Under Alternative C, there would be an increase in areas closed to OHV travel, compared with Alternative A, to about 1,235,500 acres, which includes approximately 66 percent of the decision area. This would likely limit access to production and resources, including cultural and subsistence resources.

Under Alternative C, the acres managed to protect lands with wilderness characteristics would increase by about 190,100, and the acres managed to minimize impacts on lands with wilderness characteristics would increase by about 366,900, compared with under Alternative A. Similar to under Alternative B, this change in protected lands could increase the value of nonmarket benefits provided through protected open space, compared with Alternative A. These increased benefits include values associated with conservation of ecosystems for future generations, ecosystem services provided on protected open space, way of life and sustaining lifestyles near open spaces, environmental and air quality, preservation of cultural and historical knowledge, and visual and sound resources. The benefits from these values would likely be greater under Alternative B than under Alternative A.

Under Alternative C, visitors would be directed to recreate in more populated areas, potentially leading to issues of crowding and impacts on social cohesion, similar to Alternative B. This could reduce the nonmarket values associated with recreation, including mental and physical health and visitor and viewer enjoyment from recreation, compared with Alternative A.

#### **Alternative D**

##### *Local and Regional Economic Interests and Conditions*

Under Alternative D, the areas managed as closed to OHV use would be larger than any other alternative, and land use allocations, discretionary actions including recreational activities, such as recreational shooting, and SRPs would be the most limited compared with the other alternatives. The BLM management decisions under Alternative D could increase the barriers to access certain areas and resources. These barriers to access areas and resources could allow for visitors who are experienced in dispersed recreating to enjoy more isolated and remote areas. However, the reduction in access to areas and resources would likely lead to a decrease in visitors to these areas, which could lead to more congestion and traffic in other areas of GSENM or an overall reduction in visitation to GSENM. The BLM management decisions, under Alternative D, would likely lead to a reduction in recreation expenditures due to fewer visitors staying in local hotels or eating at local restaurants, which would result in a reduction in economic contributions from recreation, through a loss in jobs, labor income, and economic output, compared with Alternative A. Limitations on SRPs could negatively impact local businesses, and could potentially lead to businesses laying off workers or closing completely. The impacts on economic contributions and local businesses could greatly affect the wellbeing and economic stability of the surrounding communities, especially those communities that rely on recreation and tourism to support the local economy and to sustain the livelihoods of the residents (see Section 3.16, Recreation, for more information on impacts on recreation and visitors).

Under Alternative D, there would be over 45,000 fewer estimated billed AUMs than under Alternative A (see Table 3-82), which could result in a decrease in economic contributions from grazing. Under Alternative D, the economic output for grazing could be approximately \$2.8 million, which would be approximately \$3.9 million less in output than under Alternative A. The number of employees and labor income attributed to the BLM's management decisions for grazing under Alternative D could be

approximately 22 employees and \$824,000, respectively. This is approximately 30 fewer jobs and \$1.1 million less in labor income than under Alternative A (see **Table 3-89**).

**Table 3-89. Economic Contributions for Grazing under Alternative D (2023\$)**

| Impact             | Employment                 |       | Labor Income (\$)          |         | Value Added (\$)           |           | Output (\$)                |           |
|--------------------|----------------------------|-------|----------------------------|---------|----------------------------|-----------|----------------------------|-----------|
|                    | Per 1000 AUMs <sup>1</sup> | Total | Per 1000 AUMs <sup>1</sup> | Total   | Per 1000 AUMs <sup>1</sup> | Total     | Per 1000 AUMs <sup>1</sup> | Total     |
| Direct             | 0.42                       | 14    | 17,235                     | 565,110 | 19,141                     | 627,593   | 53,595                     | 1,757,257 |
| Indirect           | 0.17                       | 6     | 5,871                      | 192,504 | 7,808                      | 256,025   | 23,305                     | 764,136   |
| Induced            | 0.06                       | 2     | 2,024                      | 66,375  | 5,091                      | 166,931   | 9,548                      | 313,071   |
| Total <sup>2</sup> | 0.66                       | 22    | 25,131                     | 823,989 | 32,041                     | 1,050,548 | 86,448                     | 2,834,463 |

Source: IMPLAN 2023

<sup>1</sup>Economic contribution results from IMPLAN modeling are linear, so a 10 percent change in billed AUMs, for example, would equal a 10 percent change in economic contributions. Total economic contributions from grazing could also be calculated by multiplying an estimated number of billed AUMs by the per 1,000 party multipliers, in the table above.

<sup>2</sup>Totals may not exactly equal the sum of the impacts above due to rounding.

Some permittees secure bank loans for their ranching operations, and the BLM permit is often used as part of their asset valuation for collateral. The value of the permit for the purposes of the loan is based on the number of permitted AUMs. For these permittees, a reduction in permitted AUMs due to eliminating the suspended AUMs under Alternative D could have an adverse financial impact. However, this financial impact would depend on proprietary and confidential information, including the finances of the operators and the conditions of the loan.

Some permittees choose to buy or sell permits as part of their business operations. The reduction in permitted AUMs could lead to a potential economic and financial impact on their business operations. However, the activity and value of buying and selling permits is outside the purview of the BLM, so the BLM does not put a monetary value on buying and selling permits.

Impacts on public services and infrastructure, due to economic contributions from tax revenue-generating activities, would likely be minimal, similar to Alternative A.

Under Alternative D, there would be the largest amount of land managed as ROW exclusion across all alternatives, with an increase in about 729,900 acres, compared with Alternative A. There would be a reduction in land managed as open to ROW authorization and the land managed as ROW avoidance by about 649,200 acres and 80,700 acres, respectively, compared with Alternative A. The decrease in land managed as open to ROW authorization and substantial increase in land managed as ROW exclusion would likely lead to an increase in cost associated with development of transmission lines or renewable energy. These increases in cost, under Alternative D, would likely result in an increase in rates for energy to the surrounding communities or could lead to barriers or delays in development of important energy infrastructure. This could put financial strain on the communities as well as put strain on existing energy infrastructure, which could then lead to public health and safety concerns.

*Social Conditions and Community Values*

Under Alternative D, the BLM would manage 1,209,500 acres as closed to OHV travel—about 1,208,000 acres more than Alternative A—which includes approximately 87 percent of the decision area (the most acres closed to OHV travel of all alternatives). This would likely limit access to products and resources, including cultural and subsistence resources, more than under Alternative A.

Under Alternative D, the acres managed to protect lands with wilderness characteristics would increase by 559,600, compared with under Alternative A. The acres managed for other discretionary actions—while not protecting wilderness characteristics—would be reduced to zero under Alternative D. Under Alternative D, the BLM would place the most restrictions on other uses that would not contribute to the protection of wilderness characteristics. As such, the benefits associated with protected open spaces would likely be highest under Alternative D. These increased benefits include values associated with conservation of ecosystems for future generations, ecosystem services provided on protected open space, way of life and sustaining lifestyles near open spaces, environmental and air quality, preservation of cultural and historical knowledge, and visual and sound resources. The benefits from these values would likely be greater under Alternative D than under Alternative A.

On the other hand, the nonmarket values and ecosystem services associated with uses like recreation and grazing would likely be lowest under Alternative D. The reduced values could include impacts on social cohesion, mental and physical health, and visitor and viewer enjoyment from recreation.

**Alternative E**

*Local and Regional Economic Interests and Conditions*

Under Alternative E, impacts on recreation visitors and economic conditions from changes in BLM management decisions regarding recreation would be similar to impacts under Alternative C, except that there could be additional recreation visitors and increased economic contributions associated with recreation due to the over 1.1 million additional acres that would allow recreational shooting, under Alternative E, compared with Alternative C (see **Section 3.17**, Recreation, for more information on impacts on recreation and visitors).

Under Alternative E, the estimated number of billed AUMs could be almost 2,200 AUMs less than under Alternative A (see **Table 3-82**). This reduction in AUMs would likely result in a decrease in economic contributions from grazing under Alternative E, compared with Alternative A. Under Alternative E, the economic output for grazing could be approximately \$6.6 million, which would be approximately \$189,000 less in output than under Alternative A. Under Alternative E, the number of employees and labor income attributed to the BLM’s management decisions for grazing could be approximately 50 employees and \$1.9 million, respectively, which is approximately 1 jobs fewer and \$55,000 less in labor income than under Alternative A (**Table 3-90**; see **Table 3-88**).

**Table 3-90. Economic Contributions for Grazing under Alternative E (2023\$)**

| Impact             | Employment                 |       | Labor Income (\$)          |           | Value Added (\$)           |           | Output (\$)                |           |
|--------------------|----------------------------|-------|----------------------------|-----------|----------------------------|-----------|----------------------------|-----------|
|                    | Per 1000 AUMs <sup>1</sup> | Total | Per 1000 AUMs <sup>1</sup> | Total     | Per 1000 AUMs <sup>1</sup> | Total     | Per 1000 AUMs <sup>1</sup> | Total     |
| Direct             | 0.42                       | 32    | 17,235                     | 1,311,113 | 19,141                     | 1,456,080 | 53,595                     | 4,077,016 |
| Indirect           | 0.17                       | 13    | 5,871                      | 446,629   | 7,808                      | 594,003   | 23,305                     | 1,772,873 |
| Induced            | 0.06                       | 5     | 2,024                      | 153,996   | 5,091                      | 387,296   | 9,548                      | 726,357   |
| Total <sup>2</sup> | 0.66                       | 50    | 25,131                     | 1,911,738 | 32,041                     | 2,437,379 | 86,448                     | 6,576,246 |

Source: IMPLAN 2023

<sup>1</sup>Economic contribution results from IMPLAN modeling are linear, so a 10 percent change in billed AUMs, for example, would equal a 10 percent change in economic contributions. Total economic contributions from grazing could also be calculated by multiplying an estimated number of billed AUMs by the per 1,000 party multipliers, in the table above.

<sup>2</sup>Totals may not exactly equal the sum of the impacts above due to rounding.



Impacts on public services and infrastructure, due to economic contributions from tax revenue-generating activities, would likely be minimal, similar to Alternative A.

Under Alternative E, there would be a reduction in land managed as open to ROW authorization by about 619,500 acres, compared with Alternative A, which is the same as under Alternative C. However, there would be an increase in the in land managed as ROW exclusion and land managed as ROW avoidance of about 370,500 acres and 250,600 acres, compared with Alternative A, which is slightly more land managed as ROW exclusion than under Alternative C. The impacts on the regional and local economies and communities from changes ROW authorization would be similar to Alternative C, but would likely result in slightly more impacts due to the larger number of acres managed as ROW exclusion.

#### *Social Conditions and Community Values*

Under Alternative E, the impacts on nonmarket values, social conditions, and community values from changes in areas closed to OHV travel, acres managed to protect lands with wilderness characteristics, and recreational areas would likely be similar as under Alternative C, except there might be more access to and quality of nonmarket values associated with recreation, especially for those who value recreational shooting.

### **Cumulative Impacts**

#### *Local and Regional Economic Interests and Conditions*

Past, present, and reasonably foreseeable recreation and grazing projects and activities in the analysis area and the surrounding communities could contribute to cumulative impacts in the regional economy. The recreation projects that improve or add hiking and mountain biking trails, dispersed camping sites, and site facilities would increase the number of visitors to the area. This, in turn, would increase the visitors to GSENM and further increase the economic contributions associated with recreation in GSENM. **Under more restrictive alternatives there would be greatly reduced areas which some activities could occur or not be allowed.**

#### *Social Conditions and Community Values*

Past, present, and reasonably foreseeable projects and activities could contribute to the cumulative impacts in the communities surrounding GSENM. In particular, the fire stabilization projects could contribute to the nonmarket benefits from fire and fuels management decisions within GSENM. Additionally, the projects associated with recreation that improve or add recreational sites in the analysis area could increase the number of visitors to the area, which could contribute to the total overall nonmarket benefits associated with recreation.

## 3.22 ENVIRONMENTAL JUSTICE

The following subsections discuss current conditions, trends, and forecasts of environmental justice values associated with uses of BLM-managed lands for the environmental justice analysis area (Kane, Garfield, Beaver, Iron, Piute, San Juan, Washington, and Wayne Counties in Utah and Coconino and Mohave Counties in Arizona). The counties in the analysis area were chosen because they include the counties where GSENM is located (Kane and Garfield in Utah) and counties with communities that rely on the land around and in GSENM for cultural, traditional, recreational, or livelihood purposes that might be impacted by the BLM's management decisions. The discussion focuses on information that is most relevant to the scope of the current BLM planning effort for GSENM.

### 3.22.1 Affected Environment

#### **Current Conditions**

Executive Order 12898 established the responsibility of each federal agency to “make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations” (59 *Federal Register* 7629, February 16, 1994). Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fundamental principles of environmental justice are that everyone has the same degree of protection from environmental and health hazards and equal access to the decision-making process to have a healthy environment in which to live, learn, and work. An evaluation of environmental justice impacts requires identification of minority and low-income populations (including Tribal Nations) within the affected area and evaluation of the potential for the alternatives to have disproportionately high and adverse impacts on such populations. This section and [Appendix I.22](#) provide a screening analysis of the environmental justice [populations within the analysis](#). [Appendix I.22](#) includes additional details on the thresholds and definitions used for identifying the environmental justice populations shown in [Table 3-91](#) as well as the trends and forecasts of current and future conditions of environmental justice [populations in GSENM](#). Evaluation of potential adverse impacts on these populations will take place during the impacts analysis.

[Table 3-91](#) shows data for potential environmental justice populations in the environmental justice analysis area. The reference group for whether an environmental justice population exists is the state of Utah or Arizona. [Figure 3-43](#), Minority Populations near GSENM, and [Figure 3-44](#), Low-Income Populations near GSENM, in [Appendix A](#) show the counties in Utah near and surrounding GSENM, shaded by minority population and low-income population, respectively. [Across the environmental justice analysis area, all counties except Beaver County met the threshold for low-income environmental justice populations, only San Juan County met the threshold for minority environmental justice populations, and Garfield County and San Juan County met the threshold for Native American Environmental justice populations. See \[Appendix I, Section I.22\]\(#\) for more details on environmental justice populations in the analysis area.](#)

**Table 3-9I. Environmental Justice Screening for Environmental Justice Analysis Area (2021)**

| Geography                | Low Income (%) | Minority (%) | Native American (%) |
|--------------------------|----------------|--------------|---------------------|
| <b>Utah Counties</b>     |                |              |                     |
| Garfield County          | <b>41.3</b>    | 11.4         | <b>4.8</b>          |
| Kane County              | <b>34.9</b>    | 9.3          | 3.3                 |
| Beaver County            | 22.0           | 15.7         | 1.6                 |
| Iron County              | <b>39.6</b>    | 14.6         | 2.5                 |
| Piute County             | <b>51.6</b>    | 4.2          | 0.2                 |
| San Juan County          | <b>42.0</b>    | <b>55.7</b>  | <b>48.8</b>         |
| Washington County        | <b>28.9</b>    | 16.0         | 1.7                 |
| Wayne County             | <b>36.0</b>    | 8.3          | 1.0                 |
| Reference area (Utah)    | 25.5           | 22.1         | 4.8                 |
| <b>Arizona Counties</b>  |                |              |                     |
| Coconino County          | <b>37.8</b>    | 46.2         | <b>28.3</b>         |
| Mohave County            | <b>37.8</b>    | 23.3         | 3.3                 |
| Reference area (Arizona) | 33.0           | 45.9         | 5.6                 |

Source: U.S. Department of Commerce 2022

Note: Bold values highlight the populations that meet the environmental justice thresholds.

Climate change affects environmental justice communities through increased risk of drought and wildfires. An increase in the risk of drought through climate change reduces access to clean water. An increase in risk of wildfires creates health and safety concerns and increase risk of property and resource destruction, including potential destruction to cultural resources or access to woodland products.

### 3.22.2 Environmental Consequences

Refer to **Section F.3I**, Environmental Justice, in **Appendix F**, Analytical Framework, for descriptions of the indicators, analysis areas, and assumptions used for the following analysis.

#### Issue

- How would BLM management actions impact the environment, health, and livelihoods of communities with environmental justice concerns?

#### Impacts Common to All Alternatives

As mentioned above in the *Affected Environment* section, environmental justice communities were identified in the analysis area; therefore, the BLM conducted a further analysis to identify any adverse impacts that disproportionately affect these environmental communities. Under all alternatives, there could be adverse impacts on environmental justice communities. These impacts may include impacts on water quality, travel and transportation, and economic contributions; however, the degree to which these impacts disproportionately affect environmental justice communities often depends on the site-specific activities that cause the impacts, and the mitigation measures that the BLM takes can reduce the impacts overall, as described in additional detail below.

Under all alternatives, the BLM's management decisions regarding surface-disturbing activities and vegetation management could lead to degradation of water quality in the analysis area (see **Section 3.4**, Water Resources, for more information on impacts on water quality). The level to which these impacts

on water quality could disproportionately affect environmental justice populations depends on the magnitude of the water quality impacts, location of the impacted surface and groundwater, and whether the impacts would affect public water systems. Under all alternatives, proposed mitigation measures will be taken to stabilize soils to prevent runoff, and surface-disturbing actions will be limited to areas that do not pose a threat to public water systems. Under all alternatives, the BLM's management decisions could impact development of water infrastructure and the use of water rights for the local communities; however, these impacts would depend on the location of the decisions and would require a site-specific analysis at the project level.

Compared with other communities within the region, communities of environmental justice concern may have reduced access for community members to physical and health-related infrastructure. A change in conditions brought on by BLM management may, therefore, result in disproportionate effects as experienced by these populations in cases where such access constraints are exacerbated by changing resource conditions. Similarly, subsistence uses, such as hunting and fishing, may occur in the analysis area. These subsistence uses can contribute to meeting the nutritional dietary needs of households with limited incomes. Depending on the nature and degree of subsistence activity, BLM management actions could adversely affect access to subsistence resources (for example, by limiting vehicle access to areas used for subsistence hunting among communities of environmental justice concern). The degree to which such effects would occur would be speculative to assert, however, at the current scale of analysis. Site-specific NEPA analysis would be required to ascertain the degree to which these populations would be impacted because the specific nature of effects is dependent upon site-specific considerations that are not presently known.

Under all alternatives, the BLM-authorized activities within GSENM that have the potential to contribute to emissions and affect air quality include prescribed fire activities, which could increase smoke in the analysis area; livestock grazing operations; and travel and transportation management, which could increase dust in the analysis area. However, the BLM would take measures to limit the impacts of activities on air quality, and any impacts on air quality would likely affect the local communities evenly, regardless of race or ethnicity identity or low-income status. Prescribed fires could lead to beneficial impacts, including the prevention of significantly worse (and unplanned) emissions of unmanaged wildfire and significant damage to property and cultural resources, among others. The extent to which these impacts would disproportionately impact environmental justice communities would require a site-specific analysis to ascertain the degree to which these populations would be impacted because the specific nature of effects is dependent upon site-specific considerations that are not presently known. See **Section 3.1**, Air Resources, and **Section 3.13**, Fire and Fuels Management, for more detail.

Under all alternatives, the BLM's management decisions could result in impacts on travel and transportation management. Certain designations on BLM-managed land can contain restrictions on travel that adversely affect transportation and access including RMAs, special designations such as ACECs and WSAs, and management of lands with wilderness characteristics. While these impacts affect all communities, environmental justice populations might be disproportionately impacted due to limited methods of mitigating these impacts or the heavier burden on environmental justice populations to alter their commutes due to impacts on travel and transportation. Additionally, there could be disproportionate impacts on environmental justice communities if the BLM's management decisions restrict access to culturally significant resources or areas of interest to certain environmental justice communities, such as

Tribal Nations. See **Section 3.7**, Tribal Interests, and **Section 3.18**, Travel Management, for more information.

Oak harvesting is an important traditional use for tribal members in GSENM, and pinyon and juniper is often harvested for firewood. The BLM's management decisions could disproportionately impact environmental justice communities who rely on wood harvesting for heating sources or other uses; however, impacts on use of wood for heating sources could also improve air quality for the surrounding community, including environmental justice populations. These impacts would be site specific and depend on the relative location of the decision in relation to the environmental justice communities, and the location and concentration of the wood use. Under all alternatives, the BLM would continue to coordinate and consult with tribes with ties to GSENM. Also, the BLM would implement mitigation measures that could reduce impacts on tribal communities, such as impacts on access to wood harvesting resources, sustenance resources, and cultural and spiritual resources. See **Section 3.6**, Cultural Resources, **and Section 3.7**, Tribal Interests, for more information.

Under all alternatives, the BLM's decisions on fire and fuels management could protect important cultural and tribal resources by preventing catastrophic wildfires. These management decisions could provide beneficial impacts on the local communities and could benefit environmental justice populations, due to the importance of these culturally significant resources and areas to tribal members. See **Section 3.7**, Tribal Interests, and **Section 3.13**, Fire and Fuels Management, for more information.

Under all alternatives, there could be impacts on visual and sound resources; however, these impacts would depend on site-specific projects, and they may affect all communities regardless of race or ethnic identities or low-income status. Site-specific NEPA analysis would be required to ascertain the degree to which these populations would be impacted because the specific nature of effects is dependent upon site-specific considerations that are not presently known. See **Section 3.10**, Visual Resources, **Section 3.11**, Dark Night Skies, and **Section 3.12**, Natural Soundscapes, for more information.

Under all alternatives, GSENM contributes to the local economy by providing jobs, labor income, and economic output. This contribution to the economy impacts the community as a whole; however, it tends to be more impactful on environmental justice communities by providing employment opportunities and public services to those who are low income or those who might have fewer resources to seek out employment and services elsewhere. On the other hand, increases in recreation- and tourism-related industries could adversely impact environmental justice communities by attracting second homeowners and driving up housing costs or increasing competition for jobs by attracting nonlocal job seekers (especially seasonal workers in recreation-related industries). Refer to the discussion in **Section 3.21**, Social and Economic Values, for more information on specific industries present in the analysis area and current trends in local employment.

#### **Alternative A**

Under Alternative A, surface-disturbing activities would be avoided in drinking water source-protection zones and culinary water sources, and the BLM would develop and implement mitigation measures that could limit impacts that pose a threat to public water systems, which could reduce the impacts on water quality for environmental justice communities. However, Alternative A would likely be less protective against impacts on water quality than Alternative B. Therefore, under Alternative A, there could be more adverse impacts on water quality than under Alternatives B, C, **D**, and **E**. These impacts would likely affect

the whole population in the community equally, regardless of race or ethnic identity or low-income status. Site-specific NEPA analysis would be required to ascertain the degree to which these populations would be impacted because the specific nature of effects is dependent upon site-specific considerations that are not presently known. Therefore, environmental justice communities would not likely be disproportionately impacted by any water quality effects from the BLM's management decisions.

Under Alternative A, there would be no impact on travel and transportation management. Route maintenance is not described in the 2020 Approved RMPs, which means under Alternative A, there could be public safety concerns on certain routes due to a lack of routine maintenance or improvements. Environmental justice communities could be disproportionately impacted if, due to the lack of route maintenance, certain routes closed and restricted tribal access to culturally significant resources or areas of interest. Route closures could especially impact populations who rely on access to subsistence resources for sustenance and spiritual and cultural traditions and values. However, the impacts from route closures depend on the location and would require a site-specific analysis. Additionally, under Alternative A, the counties and local governments would likely take up most of the route maintenance, so the impacts would likely be minimal.

Under Alternative A, there would continue to be land open to noncommercial harvest of woodland products. There would be no change in access to wood harvest for environmental justice communities, such as Tribal Nations; therefore, environmental justice communities' access to products and resources would not be impacted; however, environmental justice communities could be impacted from potential adverse air quality impacts from wood burning.

Under Alternative A, economic contributions would continue from the BLM's management decisions, which would continue to support the community as a whole, as well as environmental justice populations, through employment, labor income, economic output, public services, and many nonmarket benefits. However, there could continue to be negative impacts from land use such as recreation on cultural resources and other important resources to environmental justice communities.

### **Alternative B**

Alternative B would likely be more protective against water quality impacts than Alternative A because it allows for maintenance of existing water developments to protect GSENM objects, and proactive management to protect and restore the quality of water in GSENM. This means there would likely be less adverse impacts on the surrounding communities, including environmental justice communities, from water quality under Alternative B compared with Alternative A.

Under Alternative B, routes could be maintained and improved by the BLM to meet public health and safety needs. On the other hand, under Alternative B, there would be an increase in land closed to OHV use of over 952,000 acres, compared to Alternative A. This could adversely and disproportionately impact environmental justice populations if the increase in acres closed to OHV travel would restrict tribal members from accessing important cultural and subsistence resources.

Under Alternative B, the BLM would continue to allow noncommercial harvest of woodland products in many areas, except for in WSAs, lands with wilderness characteristics, areas undergoing restoration, and near identified riparian areas. This means there could be impacts on environmental justice communities from the BLM's management decisions on woodland products. However, the reduction in wood harvesting

for fuel could improve the surrounding air quality, which would impact all communities, including environmental justice communities.

Under Alternative B, the BLM's management decisions would continue to support the community and provide employment, public services, economic output, and nonmarket benefits and ecosystem services. Under Alternative B, there could be an increase in nonmarket values associated with more protected lands, which would likely impact all communities in the surrounding area. However, there could continue to be negative impacts from land use such as recreation on cultural resources and other important resources to environmental justice communities. See **Section 3.21**, Social and Economic Values, for more information on [impacts on economic and social conditions](#) from BLM management decisions.

### **Alternative C**

Alternative C would likely be more protective against water quality impacts than Alternative A because it prohibits new water developments, which could contribute to soil erosion and decrease water quality in groundwater and surface water. This means that under Alternative C, there would likely be less adverse impacts on the surrounding communities, including environmental justice communities, from water quality than under Alternative A.

Under Alternative C, impacts on the environmental justice populations due to route maintenance would be the same as under Alternative B. BLM management decisions regarding route maintenance under Alternative C could provide public health and safety benefits. On the other hand, under Alternative C, there would be an increase in land closed to OHV use of 1,208,000 acres, compared to Alternative A. This increase would mean that approximately 65 percent of the land in GSENM would be closed to OHV travel. This could adversely and disproportionately impact environmental justice populations if the increase in acres closed to OHV travel would restrict tribal members from accessing important cultural and subsistence resources.

Similar to under Alternative B, under Alternative C, the BLM would continue to allow noncommercial harvest of woodland products in many areas. The impacts from the BLM's management decisions regarding woodland products on environmental justice populations, through reductions in access to products and potential air quality increases, would be the same as under Alternative B.

Under Alternative C, similar to under Alternative B, there could be an increase in nonmarket values associated with more protected lands under Alternative C, which would likely impact all communities in the surrounding area. There would likely continue to be negative impacts from land use such as recreation on cultural resources and other important resources to environmental justice communities, similar to Alternatives A and B. See **Section 3.21**, Social and Economic Values, for more information on impacts on economic contributions and nonmarket values from BLM management decisions.

### **Alternative D**

Under Alternative D, the impacts on environmental justice communities from water quality would be similar to those described under Alternative C. Alternative D would likely result in less adverse impacts on the surrounding communities, including environmental justice communities, from water quality than Alternative A.

Under Alternative D, impacts on the environmental justice populations due to route maintenance would be the same as under Alternatives B and C. Compared with Alternative A, Alternative D would likely provide increased public health and safety benefits. Under Alternative D, however, the BLM would manage 1,438,000 acres as closed to OHV travel, which is 1,436,500 acres more than Alternative A and the most acres closed to OHV travel of all alternatives. This increase would mean that approximately 87 percent of the land in GSENM would be closed to OHV travel. This could negatively impact environmental justice communities if tribal members would be restricted in their access to culturally significant and subsistence resources or areas of interest.

The BLM's management decisions, under Alternative, would continue to support the local economy and community. However, the reduction in access to areas and resources and the restrictions in discretionary actions, including recreational activities, could lead to a decrease in visitors to these areas and throughout the GSENM. If there is a reduction in overall visitation to GSENM or a reduction in recreation expenditures in the analysis area, under Alternative D, then there could be a reduction in economic contributions from recreation, such as fewer jobs, less labor income, and less economic output, compared with Alternative A. These impacts on the economy could affect environmental justice populations, especially low-income communities who may have a heavier burden by commuting longer distances for work due to the reduction in recreation-related employment and output. The jobs associated with recreation and tourism are important in providing additional income, however these positions are often short-term or seasonal positions, which have a more limited impact on local low-income individuals who often need more steady, consistent employment over the long term to increase overall household income. If there are fewer visitors overall, there could be a reduction in negative impacts on cultural resources, which would likely impact environmental justice populations. Under Alternative D, there could be an increase in nonmarket benefits associated with more protected lands, compared with Alternatives A, B, and C, which could be especially impactful to minority populations and Tribal Nations who use GSENM for spiritual and traditional uses.

### **Alternative E**

Under Alternative E, impacts on environmental justice populations from changes due to BLM management decisions, such as changes to water quality from prohibiting new water developments, route maintenance, and noncommercial harvest of woodland products, would be the similar as under Alternative C.

### **Cumulative Impacts**

Past, present, and reasonably foreseeable projects and activities in the analysis area communities could contribute to cumulative impacts on environmental justice communities. As population and recreation visitors are expected to increase in GSENM, there is greater risk of negative impacts such as disturbance or destruction of cultural resources. Alternatives B, C, D, and E would reduce the potential for cumulative impacts on cultural resources due to limiting access to certain areas from OHV travel, compared with Alternative A. The reduction in impacts, under Alternative B, C, D, and E, on cultural resources would likely benefit environmental justice populations more than other populations due to the importance and value placed on cultural resources by tribes and other minority populations.



# Chapter 4. Consultation and Coordination

## 4.1 INTRODUCTION

This chapter documents the BLM’s public outreach, consultation, and coordination efforts throughout the preparation of this [Proposed RMP/Final EIS \(Table 4-1\)](#). The Council on Environmental Quality’s regulations (40 CFR 1506.6) provide guidance for ensuring public involvement in land use planning in accordance with NEPA. Title II, Section 202 of the FLPMA directs the BLM to coordinate its land use planning with that of tribes, other federal agencies, and state and local governments, to the extent that those external plans are consistent with the laws governing the BLM-managed surface lands.

Presidential Proclamation 10286 also directs the BLM to undertake monument planning with maximum public involvement, including, but not limited to, consultation with federally recognized Tribal Nations and state and local governments. In the development and implementation of the management plan, opportunities [are being](#) maximized pursuant to applicable legal authorities, for shared resources, operational efficiency, and cooperation. [Additional public involvement information can be found in Appendix J](#) of this Proposed RMP/Final EIS. In addition to the consultation and coordination identified in this chapter and [Appendix J](#), the BLM reviewed applicable state and county plans to identify inconsistencies with the GSENM Proposed RMP. The review of state and county plans focused on the themes or issues raised by the state and local counties throughout the RMP/EIS process and is detailed in [Appendix O](#).

**Table 4-1. Consultation, Coordination, and Public Involvement Meetings Held for the GSENM RMP/EIS**

| Meeting Time and Date | Meeting Location | Meeting Purpose                 |
|-----------------------|------------------|---------------------------------|
| July 10, 2022         | Virtual          | Monument advisory committee     |
| July 26, 2022         | Virtual          | Cooperating agencies            |
| August 17, 2022       | Virtual          | Scoping                         |
| August 24, 2022       | Escalante, Utah  | Scoping                         |
| August 30, 2022       | Virtual          | Scoping                         |
| August 31, 2022       | Kanab, Utah      | Scoping                         |
| August 25, 2022       | Virtual          | Section 106 consultation        |
| September 7, 2022     | Panguitch, Utah  | Scoping                         |
| September 15, 2022    | Kanab, Utah      | Cooperating agencies            |
| October 4, 2022       | Virtual          | Cooperating agencies            |
| October 18, 2022      | Virtual          | Monument advisory committee     |
| October 20, 2022      | Kanab, Utah      | Cooperating agencies            |
| November 9, 2022      | Virtual          | Cooperating agencies            |
| November 10, 2022     | Kanab, Utah      | Tribal co-stewardship meeting   |
| December 13, 2022     | Virtual          | Monument advisory committee     |
| January 23, 2023      | Virtual          | Tribal co-stewardship meeting   |
| February 22, 2023     | Kanab, Utah      | Cooperating agencies            |
| April 6, 2023         | Kanab, Utah      | Tribal co-stewardship meeting   |
| May 3, 2023           | Virtual          | Cooperating agencies            |
| May 10, 2023          | Virtual          | Cooperating agencies            |
| June 15, 2023         | Virtual          | Tribal government-to-government |
| June 27, 2023         | Virtual          | Monument advisory committee     |

| Meeting Time and Date | Meeting Location     | Meeting Purpose                 |
|-----------------------|----------------------|---------------------------------|
| July 19, 2023         | Virtual              | Cooperating agencies            |
| August 7, 2023        | Virtual              | Tribal government-to-government |
| September 6, 2023     | Virtual              | Public comment and NHPA         |
| September 12, 2023    | Virtual              | Monument advisory committee     |
| September 20, 2023    | Escalante, Utah      | Public comment and NHPA         |
| September 21, 2023    | Kanab, Utah          | Cooperating agencies            |
| October 4, 2023       | Kanab, Utah          | Public comment and NHPA         |
| October 17, 2023      | Salt Lake City, Utah | Public comment and NHPA         |
| October 18, 2023      | Panguitch, Utah      | Public comment and NHPA         |
| October 25, 2023      | Virtual              | Public comment and NHPA         |
| January 10, 2024      | Kanab, Utah          | Tribal government-to-government |
| March 12, 2024        | Flagstaff, Arizona   | Tribal government-to-government |

## 4.2 PUBLIC COLLABORATION AND OUTREACH

### 4.2.1 Scoping Process

Scoping is an early and open process that helps the BLM determine the scope of issues to be addressed; scoping also helps extract the overarching issues that may be added to those addressed during the planning process. These issues help define the scope of the analysis for the RMP/EIS; they may also be used to develop the EIS alternatives. Guidance for implementing public involvement under NEPA is codified in [the CEQ's regulations implementing NEPA](#).

As defined under NEPA, the scoping period began with the publication of the [Notice of Intent](#), titled "Notice of Intent to Prepare a Resource Management Plan for the Grand Staircase-Escalante National Monument in Utah and an Associated Environmental Impact Statement for the Paria River District Office, Kanab, Utah," in the [Federal Register](#) on July 29, 2022. The [Notice of Intent](#) initiated the public scoping process for the RMP/EIS. During this period, the BLM sought public comments to determine relevant issues that could influence the scope of the environmental analysis, including alternatives, and to guide the process for developing the RMP/EIS.

The BLM held five public scoping meetings during the scoping process. The BLM hosted three in-person meetings (August 24, August 31, and September 7, 2022) and two virtual public scoping meetings (August 17 and August 30, 2022) as part of the ongoing land use planning for GSENM. These meetings provided the public with opportunities to speak with BLM staff and management regarding the development of the RMP/EIS. The BLM received 416 unique written submissions during the public scoping period, comprising 1,791 unique substantive comments. Some of the most common issues commented on included recreation and travel management components of alternatives, and issues and analytic frameworks for rangeland health; livestock grazing management; recreation use; visitor services; and travel, transportation, and access management.

Additional information about the public scoping process, including the material presented at the meeting and the final scoping report, can be found here: <https://eplanning.blm.gov/eplanning-ui/project/2020343/510>.

### 4.3 CONSULTATION AND COORDINATION

This section documents the consultation and coordination efforts undertaken by the BLM throughout the RMP/EIS process. During the land use planning process, the BLM coordinates with a variety of organizations who have interests in the planning area. These organizations are largely governmental bodies with responsibility for creating, administering, and monitoring policy on public lands within the planning area. Consultation and coordination with these parties will occur throughout the development of the RMP/EIS.

#### 4.3.1 Cooperating Agencies

The regulations implementing NEPA allow federal agencies to invite Tribal Nations, state and local governments, and other federal agencies to serve as cooperating agencies during the NEPA process. To serve as a cooperating agency, the potential agency or government entity must have either jurisdiction by law or special expertise relevant to the environmental analysis.

The BLM invited Tribal Nations, state and local governments, and other federal agencies to be cooperating agencies. Of the [invited agencies](#), 14 agencies [have participated in the process with](#) the BLM to share knowledge and resources throughout the development of the RMP/EIS.

[Table 4-2](#), below, details the Tribal Nations; federal, state, and local agencies; and other organizations that participated as cooperating agencies for the RMP/EIS.

**Table 4-2. Cooperating Agencies for the GSENM RMP/EIS Planning Process**

| Agency Type | Agency Name   |
|-------------|---|
| Federal     | NPS Intermountain Regional Office and U.S. Forest Service (Dixie National Forest)   |
| State       | State of Utah   |
| Local       | Escalante City, Garfield County Commission, Kanab City, Kane County Commission, Kane County Water Conservancy District, Tropic Town, and Washington County Water Conservancy District |
| Tribal      | Hopi Tribe of Arizona, Kaibab Band of Paiute Indians, and Navajo Nation, <a href="#">and Paiute Indian Tribe of Utah</a>  |

To date, the BLM has hosted 11 cooperating agency meetings to familiarize cooperators with the RMP/EIS development process, review and provide feedback on the scoping report [and](#) draft alternatives, [and inform this Proposed RMP/Final EIS](#).

[In addition to the cooperating agency meetings with all cooperators, the BLM attended, at the request of Kane and Garfield County Commissions, four county coordination meetings. The counties set the agendas of these meetings, which included discussion on topics related to consistency of the GSENM RMP planning effort with county RMPs.](#)

#### 4.3.2 Tribal Nations

Executive Order 13175, Consultation and Coordination with Indian Tribal Governments, requires federal agencies to coordinate and consult on a government-to-government basis with sovereign Native American tribal governments whose interests may be directly and substantially affected by activities on federally administered lands. Consultation with federally recognized Native American tribes is also required under NEPA, FLPMA, and Proclamation 10286. Additionally, numerous laws, regulations, and guidance require

tribal consultation to identify any Native American cultural values, religious beliefs, or traditional practices that could be affected by BLM actions on federal lands.

The BLM has conducted tribal coordination and formal government-to-government consultation throughout the planning process. Via letters, the BLM invited the following Native American tribes to engage in government-to-government consultation in September 2022 and February 2023: All Pueblo Council of Governors, Kaibab Band of Paiute Indians, Navajo Nation, Paiute Indian Tribe of Utah (Shivwits Band of Paiute Indians, Indian Peaks Band of Paiute Indians, Kanosh Band of Paiute Indians, Cedar Band of Paiute Indians, and Koosharem Band of Paiute Indians), Pueblo of Acoma, Pueblo of San Felipe, Pueblo of Tesuque, Zuni Tribe of the Zuni Reservation, San Juan Southern Paiute Tribe of Arizona, Hopi Tribe of Arizona, Ute Mountain Ute Tribe, and Ute Indian Tribe of the Uintah and Ouray Reservation. Within these letters, the BLM also invited tribes to apply for cooperating agency status. To date, the Navajo Nation, the Hopi Tribe of Arizona, the Kaibab Band of Paiute Indians, and the Paiute Indian Tribe of Utah have cooperating agency status. The BLM facilitated the first government-to-government meeting in June 2023.

Following the initial meeting, additional government-to-government meetings were held January 10, 2024, in Kanab, Utah, and March 12, 2024, in Flagstaff, Arizona. These meetings were to discuss tribal input on the tribes' review of the Draft EIS and suggestions for the Proposed RMP. During these meetings, the BLM received valuable input from tribes regarding the RMP and associated EIS, the cultural resources management plan, and the science plan. These meetings were also invaluable to develop a tribal co-stewardship agreement for GSENM in the future. Members from the following tribes have attended one or multiple tribal co-stewardship meetings: the Navajo Nation, the Ute Mountain Ute Tribe, the Paiute Indian Tribe of Utah, the Hopi Tribe of Arizona, the Kaibab Band of Paiute Indians, the Pueblo of Tesuque, the Zuni Tribe of the Zuni Reservation, the Pueblo of Acoma, and the Ute Indian Tribe of the Uintah and Ouray Reservation. Government-to-government consultation remains ongoing.

The BLM has prioritized tribal co-stewardship efforts throughout this planning effort. The first tribal co-stewardship meeting was held in November 2022. Representatives from the U.S. Department of the Interior, Bureau of Indian Affairs, BLM, and several Tribal Nations met to discuss the possibility of a co-stewardship agreement. Since this original meeting, the BLM has continued to discuss paths forward for co-stewardship with tribes at government-to-government meetings. A desired product of these meetings was the development of an Inter-Tribal Working Group, which would consist of designated tribal representatives who participate in the co-stewardship program. Efforts to establish the Inter-Tribal Working Group remain ongoing, as do discussions regarding a proposed framework for co-stewardship.

Additional engagement efforts, supported by the Grand Canyon Trust, have included field visits to various locations across the monument. Tribal representatives joined the BLM and Grand Canyon Trust to review spring sites and rock writing locations, discuss overall management challenges, and learn together about such topics as astronomy, dark skies, and traditional views of these topics. Participants in these field visits included the Paiute Indian Tribe of Utah, Kaibab Band of Paiute, Navajo Nation, Pueblo of Zuni, Pueblo of Acoma, Hopi Tribe, and Ute Mountain Ute Tribe.

### 4.3.3 Additional Consultation

#### **U.S. Fish and Wildlife Service**

Proclamation 10286 directs the BLM to consult with other federal land management agencies in the local area during the development of the RMP/EIS. Under ESA Section 7(a)(2), the BLM must ensure the proposed action is not likely to jeopardize the continued existence of federally listed threatened and endangered species or adversely modify designated critical habitat. The Section 7 consultation between the BLM and the USFWS [has begun](#). The BLM [has coordinated](#) with the USFWS to develop a biological assessment, [and formal consultation began on February 16, 2024](#).

[A biological opinion was issued on July 1, 2024. On July 1, 2024, the BLM received a letter of conclusion of formal Section 7 consultation from the USFWS. This letter includes a statement of conclusion in which the USFWS found that the Proposed RMP is not likely to jeopardize the species included in the biological assessment, and is not likely to destroy or adversely modify designated critical habitat.](#)

#### **State Historic Preservation Office Consultation**

[One of the](#) principal federal law addressing cultural resources is the NHPA, as amended (54 USC 300101 et seq.) and its implementing regulations found at 36 CFR 800.3. These regulations, commonly referred to as the Section 106 process, describe the procedures for identifying and evaluating historic properties, for assessing the impacts of federal actions on historic properties, and for project proponents consulting with appropriate agencies to avoid, reduce, or minimize adverse effects. Historic properties are cultural resources that are over 50 years old and that meet specific criteria for listing on the National Register.

The BLM meets its obligations under the NHPA through the implementation of the regulations at 36 CFR 800, as well as through BLM cultural resources manuals and handbooks (H-8100 Series and the BLM tribal relations manuals and handbooks [H-1780 Series]); the State Protocol Agreement between the BLM and Utah [State Historic Preservation Office \(SHPO\)](#); the Small-Scale Undertakings Programmatic Agreement between the Utah BLM, SHPO, and the Advisory Council on Historic Preservation; the Manner in Which BLM will Meet its Responsibilities under the NHPA National Programmatic Agreement between the BLM, Advisory Council on Historic Preservation, and National Conference of State Historic Preservation Offices; the Solar Energy Development on Lands Administered by the BLM Programmatic Agreement between the BLM, Arizona SHPO, California SHPO, Colorado SHPO, New Mexico SHPO, Nevada SHPO, Utah SHPO, and Advisory Council on Historic Preservation; and the Coordination of Cultural Resource Consultation Requirements under Section 106 of the NHPA and Utah State Antiquities Act Programmatic Agreement between Utah Department of Transportation and the Utah BLM.

During preparation of this [Proposed RMP/Final EIS](#), the BLM coordinated with state agencies, local counties, the [Utah SHPO](#), and other consulting parties in compliance with Section 106 of the NHPA. The BLM conducted a consultation with the Utah SHPO in September 2022, per 36 CFR 800.4, for the GSENM RMP/EIS. The consultation included a description of the undertaking and area of potential effect, a summary of Native American [tribal consultation and public participation and comment](#), and identification efforts of historic properties within the area of potential effects. [The area of potential effects is the decision area for the GSENM Proposed RMP/Final EIS.](#) The Utah SHPO concurred on the consultation [for the area of potential effects. The BLM continues to work with the SHPO and consulting parties on the determination of effects to be concluded before the release of the Approved RMP and ROD.](#)

Following SHPO concurrence, the BLM invited the following consulting parties to participate in the NHPA Section 106 process to provide input on historic properties that may be affected by proposed decisions and to provide other input:

- Utah SHPO
- Kane County Commission
- Garfield County Commission
- Grant Canyon Trust
- Southern Utah Wilderness Alliance
- Utah Rock Art Research Association
- Old Spanish Trail Association
- Hole-in-the-Rock Trail Association
- NPS, National Historic Trails Office
- Western Watersheds Project
- Public Lands Policy Coordinating Office
- Glen Canyon Recreation Area staff

All consulting tribes:

- All Pueblo Council of Governors
- Kaibab Band of Paiute Indians
- Navajo Nation
- Paiute Indian Tribe of Utah
- Shivwits Band of Paiute Indians
- Indian Peaks Band of Paiute Indians
- Kanosh Band of Paiute Indians
- Cedar Band of Paiute Indians
- Koosharem Band of Paiute Indians
- Pueblo of Acoma
- Pueblo of San Felipe
- Pueblo of Tesuque
- Zuni Tribe of the Zuni Reservation
- San Juan Southern Paiute Tribe of Arizona
- Hopi Tribe of Arizona
- Ute Mountain Ute Tribe
- Ute Indian Tribe of the Uintah and Ouray Reservation

These consulting parties were invited to participate in a virtual NHPA Section 106 consultation in August 2022. The purpose of this meeting was to inform consulting parties on the goals for the new GSENM RMP/EIS and engage all consulting parties to participate in NHPA Section 106 consultation. During this consultation, the BLM initiated Section 106 consultation and asked consulting parties for comment on the

identification of historic properties and potential effects on historic properties. The BLM involved the public in the Section 106 process through the BLM’s national ePlanning website and NEPA public scoping meetings. The National Programmatic Agreement among the BLM, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers states, in the preamble under the section titled “The Public,” that the BLM may use its agency procedures or BLM NEPA procedures to involve the public (BLM 2012). The BLM notified stakeholders of the scoping period, which began July 29, 2022, and ended September 27, 2022. The BLM held public meetings for NEPA and NHPA Section 106 in Escalante, Kanab, and Panguitch, Utah, and two virtual public meetings. The public was encouraged to provide [comments related to NEPA and NHPA Section 106](#) during this time.

#### 4.3.4 Dingell Act Compliance

In accordance with the John D. Dingell, Jr. Conservation, Management, and Recreation Act of 2019 (Dingell Act), the BLM held a 90-day public comment period on the proposed recreational shooting closures within GSENM. The comment period ran concurrently with the 90-day Draft RMP/EIS comment period between August 11 and November 9, 2023. The BLM published the Notice of Intent for the Dingell comment period in the *Federal Register*<sup>1</sup> on August 8, 2023, within the Notice of Availability of the Draft RMP/EIS.

The BLM published a press release on August 10, 2023,<sup>2</sup> August 15, 2023,<sup>3</sup> and September 8, 2023,<sup>4</sup> inviting the public to review the GSENM Draft RMP/EIS; the press releases contained details and rationale on the proposed shooting closures, invited the public to submit comments and included information on how to submit comments, and provided information on the times, locations, and formats of the public meetings. The Notice of Intent and subsequent press releases were posted on the BLM ePlanning project website,<sup>5</sup> the BLM website,<sup>6</sup> and several local newspapers, including *The Wayne and Garfield County Insider* and *The Southern Utah News* on August 17, 2023. Comments received pertaining to the proposed recreation shooting closures are described in **Appendix J**.

The BLM also provided the Notice of Intent for proposed recreational shooting closures by letter to the UDWR on August 10, 2023; Utah’s Public Lands Policy Coordinating Office on July 10, 2023; and Federal Lands Hunting, Fishing, and Shooting Sports Roundtable memorandum of understanding signatories on August 7, 2023. Following the issuance of the Notice of Intent for the Dingell Act, the BLM held coordination meetings with the UDWR and Utah’s Public Lands Policy Coordinating Office on September 15, 2023, and October 20, 2023.

#### 4.4 MONUMENT ADVISORY COMMITTEE AND RESOURCE ADVISORY COUNCIL

Proclamation 10286 provides that “the Secretary shall maintain one or more advisory committees under the Federal Advisory Committee Act (5 USC App.) to provide information and advice regarding the

---

<sup>1</sup> <https://www.federalregister.gov/documents/2023/08/11/2023-17203/notice-of-availability-of-the-draft-resource-management-plan-and-environmental-impact-statement-for>

<sup>2</sup> <https://www.blm.gov/press-release/blm-invites-public-comment-draft-plan-grand-staircase-escalante-national-monument>

<sup>3</sup> <https://www.blm.gov/press-release/blm-announces-public-meetings-grand-staircase-escalante-national-monument-draft>

<sup>4</sup> <https://www.blm.gov/press-release/blm-announces-additional-public-meeting-grand-staircase-escalante-national-monument>

<sup>5</sup> <https://eplanning.blm.gov/eplanning-ui/project/2020343/510>

<sup>6</sup> <https://www.blm.gov/press-release/blm-invites-public-comment-draft-plan-grand-staircase-escalante-national-monument>

development of the above-described management plans, and, as appropriate, management of the monument.” A GSENM monument advisory committee (MAC) charter was signed on September 5, 2018; it memorialized a 15-member committee that includes state and local government officials, tribal members, representatives of the recreation community, local business owners, and private landowners. To date, there have been five MAC meetings to discuss the GSENM RMP/EIS planning effort in which the BLM has provided the MAC with information regarding the development of the Proposed RMP. These meetings were on July 12, October 18, and December 13, 2022; June 27, 2023; and September 12, 2023.

#### 4.5 LIST OF PREPARERS

**Table 4-3** lists the people primarily responsible for preparing the RMP/EIS.

**Table 4-3. List of Preparers for the GSENM RMP/EIS**

| Name                             | Project Role/Description of Work  | Job Title*  |
|----------------------------------|---|---|
| <b>Bureau of Land Management</b> |   |   |
| Scott Whitesides                 | Project Manager; Contracting Officer’s Representative   | GS-0301-13, Planning and Environmental Policy Analyst |
| Tye Morgan                       | Project Manager; Utah State Office Representative   | GS-0301-13, Planning and Environmental Coordinator    |
| Bryce Franklin                   | Project Manager; Assistant Contracting Officer Representative   | GS-0301-12, Project Manager                           |
| Harry Barber                     | Paria River District Manager  | GS-0301-14, District Manager                          |
| Adé Nelson                       | GSENM Manager   | GS-0301-13, Monument Manager GSENM                    |
| Artemisia Turiya                 | Planning and Environmental Coordinator; Vegetation Group Lead   | GS-0301-12, Planning and Environmental Coordinator    |
| David Hercher                    | Public Affairs Specialist   | GS-1035-12, Public Affairs Specialist                 |
| Erik Vernon                      | Air Quality and Climate; Soundscapes  | GS-1301-13, Physical Scientist                        |
| Sandra Zarzycka                  | Cultural Resource Management; History, Historic Resources, and Sense of Place   | GS-0193-11, Archaeologist                             |
| Lori Hunsaker                    | Cultural Resource Management, Archaeology (BLM Utah State Office)   | GS-0193-13, Archaeologist                             |
| Jessica Montcalm                 | Tribal Liaison (BLM Utah State Office)  | GS-0301-12, Tribal Liaison                            |
| Bill Stevens                     | Environmental Justice; Social and Economic Values   | GS-0023-11, Outdoor Recreation Planner                |
| Les Gonyer                       | Hydrology   | GS-1315-11, Hydrologist                               |
| Jared Dalebout                   | Hydrology; Wild and Scenic Rivers   | GS-1315-12, Hydrologist                               |
| Cassie Mellon                    | Fisheries; AIM Analysis   | GS-0482-12, Fishery Biologist                         |
| Brandon Johnson                  | Lands and Realty  | GS-1170-12, Realty Specialist                         |
| Allysia Angus                    | Landscape Characteristics, including Visual Resources, Scenery, Dark Night Skies, and Natural Soundscapes; Scenic Routes; Recreation and Visitor Services | GS-807-12, Landscape Architect                        |



4. Consultation and Coordination (List of Preparers)

| <b>Name</b>   | <b>Project Role/Description of Work</b>   | <b>Job Title*</b>                                      |
|---|---|--|
| Dustin Rooks  | Noxious Weeds and Invasive, Nonnative Plants; Vegetation Resilience and Conservation; Threatened and Endangered Species   | GS-0430-12, Botanist                                   |
| Alan Titus  | Paleontological Resources and Geology; Science  | GS-1350-11, Paleontologist                             |
| Sean Stewart  | Rangeland Health and Livestock Grazing Management   | GS-0454-12, Rangeland Management Specialist            |
| Jason Bybee   | Rangeland Health and Livestock Grazing Management   | GS-340-11, Rangeland Management Specialist             |
| Jabe Beal   | Recreation Use and Visitor Services; Wilderness Study Areas; Lands with Wilderness Characteristics; Travel, Transportation, and Access; Old Spanish National Historic Trail | GS-0023-11, Outdoor Recreation Planner                 |
| Clay Stewart  | Recreation Use and Visitor Services; Wilderness Study Areas; Lands with Wilderness Characteristics; Travel, Transportation, and Access                                      | GS-0023-11, Outdoor Recreation Planner                 |
| Rob Sweeten   | Old Spanish National Historic Trail   | GS-0401-13, Natural Resource Specialist                |
| Ray Kelsey  | Wild and Scenic Rivers; Areas of Critical Environmental Concern   | GS-0401-12, Natural Resource Specialist                |
| Raven Chavez  | Soil Resources  | GS-0470-11, Soil Scientist                             |
| Shawn Peterson  | Fire and Fuels  | GS-0401-12, Natural Resource Specialist                |
| Cameron McQuivey  | Wildlife; Threatened and Endangered Species   | GS- 0486-11, Wildlife Biologist                        |
| Jason Bybee   | Rangeland Health  | GS-0455-07, Rangeland Management Specialist            |
| Jason Stewart   | GIS (Mapping)   | GS-0301-11, GIS Specialist                             |
| Evan Glenn  | Recreational Use and Visitor Services   | GS-0401-12, Natural Resource Specialist                |
| Jason Burgess-Conforti  | AIM Analysis  | GS-0401-12, Natural Resource Manager                   |
| Tess Webb   | AIM Analysis  | GS-0401-11, Data Analyst (Natural Resource Monitoring) |
| Kati Chachere   | Air Quality/Climate; Soundscapes  | GS-1301-12, Physical Scientist                         |
| <b>Environmental Management and Planning Solutions Inc. (EMPSi now part of AECOM)</b> |   |  |
| Luke Hodges   | Wildlife; Threatened and Endangered Species   | Senior Scientist/<br>Engineer: Level 4                 |
| Andrew Wilkins  | Project Manager; Cultural Resources Management; Native American Religious Concerns and Tribal Use; History, Historic Resources, and Sense of Place                          | Principal Scientist/<br>Engineer: Level 3              |
| James Hereford II   | Assistant Project Manager; multiple sections of the RMP/EIS   | Senior Scientist/<br>Engineer: Level 2                 |
| Bronson Pace  | Project Coordinator; various sections of the RMP/EIS  | Senior Scientist/<br>Engineer: Level 3                 |
| Holly Prohaska  | Senior NEPA Adviser/Quality Assurance Specialist  | Principal Scientist/<br>Engineer: Level 4              |
| Meredith Linhoff  | Natural Resources Team Lead; assisted with the GSENM Science Plan   | Principal Scientist/<br>Engineer: Level 3              |
| Angie Adams   | Resource Use and Special Designations Team Lead   | Principal Scientist/<br>Engineer: Level 2              |

4. Consultation and Coordination (List of Preparers)

| <b>Name</b>                           | <b>Project Role/Description of Work</b>  | <b>Job Title*</b>                         |
|---------------------------------------|--|---|
| Zoe Ghali                             | Community Outreach Adviser; Socioeconomics and Environmental Justice Lead  | Senior Scientist/<br>Engineer: Level 1    |
| Alli Yamnitsky                        | Public Involvement (including MAC assistance); Wild and Scenic Rivers; Areas of Critical Environmental Concern; Old Spanish National Historic Trail; Wilderness Study Areas; Scenic Byways | Scientist/<br>Engineer: Level 2           |
| Clayton McGee                         | Comment Analysis; <a href="#">Appendix J support/comment analysis and response support</a>   | Scientist/<br>Engineer: Level 4           |
| Liza Schill                           | Project Record; various sections of the RMP/EIS  | Scientist/<br>Engineer: Level 3           |
| Amy Cordle                            | Air Quality and Climate Lead   | Principal Scientist/<br>Engineer: Level 3 |
| Shine Roshan                          | Air Quality and Climate  | Senior Scientist/<br>Engineer: Level 4    |
| Erin Hudson                           | Cultural Resources Management; Native American Religious Concerns and Tribal Use; History, Historic Resources, and Sense of Place; also assisted with other sections of the RMP/EIS        | Principal Scientist/<br>Engineer: Level 3 |
| Camila Reiswig                        | Environmental Justice; Social and Economic Values  | Senior Scientist/<br>Engineer: Level 4    |
| Shannon Regan                         | Noxious Weeds and Invasive, Nonnative Plants; Vegetation Resilience and Conservation   | Senior Scientist/<br>Engineer: Level 4    |
| Morgan Trieeger                       | Noxious Weeds and Invasive, Nonnative Plants; Fire and Fuels   | Senior Scientist/<br>Engineer: Level 3    |
| Andy Spellmeyer                       | Rangeland Health and Livestock Grazing Management  | Senior Scientist/<br>Engineer: Level 3    |
| Derek Holmgren                        | Recreation Use and Visitor Services; Travel, Transportation, and Access Management   | Senior Scientist/<br>Engineer: Level 2    |
| Noelle Crowley                        | Recreation Use and Visitor Services; Travel, Transportation, and Access Management   | Scientist/<br>Engineer: Level 1           |
| Amy Lewis                             | Wild and Scenic Rivers; Areas of Critical Environmental Concern; Old Spanish National Historic Trail; Wilderness Study Areas; Scenic Byways  | Principal Scientist/<br>Engineer: Level 2 |
| Emma Davis                            | Lands with Wilderness Characteristics  | Scientist/<br>Engineer: Level 4           |
| Victoria Dekle                        | <a href="#">General assistance with multiple sections of the RMP/EIS</a>   | Senior Scientist/<br>Engineer: Level 1    |
| Perry Lown                            | <a href="#">General assistance with multiple sections of the RMP/EIS</a>   | Scientist/<br>Engineer: Level 2           |
| Cortney Luxford                       | <a href="#">General assistance with multiple sections of the RMP/EIS</a>   | Senior Scientist/<br>Engineer: Level 3    |
| Jenna Jonker                          | GIS ( <a href="#">Mapping and Figures</a> )  | GIS: Level 1                              |
| Marcia Rickey                         | GIS ( <a href="#">Mapping and Figures</a> )  | GIS: Level 1                              |
| Rob Lavie                             | GIS ( <a href="#">Mapping and Figures</a> )  | GIS: Level 1                              |
| <b>SWCA Environmental Consultants</b> |  |   |
| Matt Westover                         | Project Manager; Lands and Realty  | Principal Scientist/<br>Engineer: Level 4 |
| Arianna Disser                        | Hydrology (groundwater, surface water, wetlands, riparian areas, floodplains, and water quality); Soils and Biological Soils Crusts  | Scientist/<br>Engineer: Level 1           |
| Victoria Edwards                      | Lands and Realty ( <a href="#">Rights-of-Way</a> )   | Scientist/<br>Engineer: Level 2           |

4. Consultation and Coordination (List of Preparers)

| <b>Name</b>    | <b>Project Role/Description of Work</b>  | <b>Job Title*</b>                         |
|----------------|--|---|
| Chris Bockey   | Landscape Characteristics, including Visual Resources, Scenery, Dark Night Skies, and Natural Soundscapes; Scenic Routes | Senior Scientist/<br>Engineer: Level 1    |
| Kevin Rauhe    | Landscape Characteristics, including Visual Resources, Scenery, Dark Night Skies, and Natural Soundscapes; Scenic Routes | Senior Scientist/<br>Engineer: Level 3    |
| Vicki Meyers   | Paleontological Resources and Geology; Science   | Principal Scientist/<br>Engineer: Level 2 |
| Mandy Bengtson | Soils and Biological Soils Crusts  | Principal Scientist/<br>Engineer: Level 2 |
| Kari Chalker   | Forestry and Woodlands   | Principal Scientist/<br>Engineer: Level 2 |
| Mathew Carson  | Paleontology and Geology   | Principal Scientist/<br>Engineer: Level 3 |
| Lia Webb       | Soil Resources   | Principal Scientist/<br>Engineer: Level 2 |
| Julia Aaronson | Paleontology and Geology   | Principal Scientist/<br>Engineer: Level 4 |

This page intentionally left blank.

# References

## **Executive Summary**

BLM (United States Department of the Interior, Bureau of Land Management). 2000. Grand Staircase-Escalante National Monument Management Plan. February. Internet website: <https://eplanning.blm.gov/eplanning-ui/project/94706/570>.

Scott, M., L. Reynolds, P. Shafroth, and J. Spence. 2017. "The role of a non-native tree in riparian vegetation expansion and channel narrowing along a dryland river." *Ecohydrology* 2018:e1988. Internet website: [https://www.researchgate.net/profile/Lindsay-Reynolds-4/publication/325209712\\_The\\_role\\_of\\_a\\_non-native\\_tree\\_in\\_riparian\\_vegetation\\_expansion\\_and\\_channel\\_narrowing\\_along\\_a\\_dryland\\_river\\_Russian\\_olive\\_invasion\\_along\\_a\\_dryland\\_river/links/5cf6d9c5299b1fb185974a4/The-role-of-a-non-native-tree-in-riparian-vegetation-expansion-and-channel-narrowing-along-a-dryland-river-Russian-olive-invasion-along-a-dryland-river.pdf?origin=publication\\_detail](https://www.researchgate.net/profile/Lindsay-Reynolds-4/publication/325209712_The_role_of_a_non-native_tree_in_riparian_vegetation_expansion_and_channel_narrowing_along_a_dryland_river_Russian_olive_invasion_along_a_dryland_river/links/5cf6d9c5299b1fb185974a4/The-role-of-a-non-native-tree-in-riparian-vegetation-expansion-and-channel-narrowing-along-a-dryland-river-Russian-olive-invasion-along-a-dryland-river.pdf?origin=publication_detail).

## **Chapter 1**

BLM GIS (United States Department of the Interior, Bureau of Land Management geographic information system). 2022. GIS data used in the GSENM alternatives, affected environment, and impact analysis. Kanab, Utah. Last edited [April 19, 2024](#).

Congress.gov. 2008. Text – H.R.2016 – 110th Congress (2007–2008): National Landscape Conservation System Act. April 10, 2008. Internet website: <https://www.congress.gov/bill/110th-congress/house-bill/2016/text>.

## **Chapter 2**

BLM (United States Department of the Interior, Bureau of Land Management). 1997. Standards for Rangeland Health and Guidelines for Grazing Management for BLM Lands in Utah. BLM, Utah State Office, Salt Lake City, Utah.

\_\_\_\_\_. 2000. Grand Staircase-Escalante National Monument Management Plan. February. Internet website: <https://eplanning.blm.gov/eplanning-ui/project/94706/570>.

BLM GIS (United States Department of the Interior, Bureau of Land Management geographic information system). 2022. GIS data used in the GSENM alternatives, affected environment, and impact analysis. Kanab, Utah. Last edited [April 19, 2024](#).

Scott, M., L. Reynolds, P. Shafroth, and J. Spence. 2017. The role of a non-native tree in riparian vegetation expansion and channel narrowing along a dryland river. *Ecohydrology* 2018;e1988. Internet website: [https://www.researchgate.net/profile/Lindsay-Reynolds-4/publication/325209712\\_The\\_role\\_of\\_a\\_non-native\\_tree\\_in\\_riparian\\_vegetation\\_expansion\\_and\\_channel\\_narrowing\\_along\\_a\\_dryland\\_river\\_Russian\\_olive\\_invasion\\_along\\_a\\_dryland\\_river/links/5cf6d9c5299b1fb185974a4/The-role-of-a-non-native-tree-in-riparian-vegetation-expansion-and-channel-narrowing-along-a-dryland-river-Russian-olive-invasion-along-a-dryland-river.pdf?origin=publication\\_detail](https://www.researchgate.net/profile/Lindsay-Reynolds-4/publication/325209712_The_role_of_a_non-native_tree_in_riparian_vegetation_expansion_and_channel_narrowing_along_a_dryland_river_Russian_olive_invasion_along_a_dryland_river/links/5cf6d9c5299b1fb185974a4/The-role-of-a-non-native-tree-in-riparian-vegetation-expansion-and-channel-narrowing-along-a-dryland-river-Russian-olive-invasion-along-a-dryland-river.pdf?origin=publication_detail).

### Chapter 3<sup>1</sup>

#### Air Quality

AirToxScreen. 2023. 2019 AirToxScreen Mapping Tool. 2023. Internet website: <https://www.epa.gov/AirToxScreen/2019-airtoxscreen>.

Clean Air Scientific Advisory Committee. 2023. Clean Air Scientific Advisory Committee Review of the EPA’s Policy Assessment for the Reconsideration of the Ozone National Ambient Air Quality Standards (External Review Draft Version 2). A Federal Advisory Committee to the United States Environmental Agency. Washington, DC. June 9.

EPA (United States Environmental Protection Agency). 2001. Visibility Report to Congress – November 2001. Visibility in Mandatory Federal Class I Areas, 1994–1998. A Report to Congress. Internet website: <https://www.epa.gov/visibility/visibility-report-congress-november-2001>.

\_\_\_\_\_. 2023a. National Ambient Air Quality Standards for PM. Last updated on March 29, 2023. Internet website: <https://www.epa.gov/pm-pollution/national-ambient-air-quality-standards-naaqs-pm>.

\_\_\_\_\_. 2023b. 2020 National Emissions Inventory Data. Online retrieval tool. Internet website: <https://www.epa.gov/air-emissions-inventories/2020-national-emissions-inventory-nei-data>.

\_\_\_\_\_. 2023c. Outdoor Air Quality Data. Daily data download tool. Last updated on February 9, 2023. Internet website: <https://www.epa.gov/outdoor-air-quality-data/download-daily-data>.

Fox, D. G., A. M. Bartuska, J. G. Byrne, E. Cowling, R. Fisher, G. E. Likens, S. E. Lindberg, et al. 1989. A Screening Procedure to Evaluate Air Pollution Effects on Class I Wilderness Areas. General Technical Report. RM-168. U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colorado.

Jaffe, D. A., S. M. O’Neill, N. K. Larkin, A. L. Holder, D. L. Peterson, J. E. Halofsky, and A. G. Rappold. 2020. “Wildfire and prescribed burning impacts on air quality in the United States.” *Journal of the Air and Waste Management Association* 70(6):583–615. Internet website: <https://www.tandfonline.com/doi/full/10.1080/10962247.2020.1749731>.

<sup>1</sup> Chapter 3 references also include those from Appendix I (Affected Environment), from which these sections originally derived.

- NPS (United States Department of the Interior, National Park Service). 2022a. Map of NPS Class I Areas. Internet website: [https://www.nps.gov/subjects/air/upload/Class\\_I\\_Areas\\_NPS\\_web\\_small.png](https://www.nps.gov/subjects/air/upload/Class_I_Areas_NPS_web_small.png).
- \_\_\_\_\_. 2022b. Air Quality in Parks; Air Quality Conditions and Trends. Internet website: <https://www.nps.gov/subjects/air/park-conditions-trends.htm>.
- Utah Division of Air Quality. 2017. Statewide Emissions Inventories. Internet website: <https://deq.utah.gov/air-quality/2017-statewide-emissions-inventories>.
- \_\_\_\_\_. 2021. Utah Smoke Management Plan 2021. Internet website: <https://smokemgt.utah.gov/static/pdf/UtahSMP.pdf>.
- \_\_\_\_\_. 2022. Annual Monitoring Network Plan 2022. Internet website: <https://documents.deq.utah.gov/air-quality/planning/air-monitoring/DAQ-2022-007189.pdf>.
- Western Regional Air Partnership. 2023a. Western Regional Air Partnership Technical Support System. Colorado State University and the Cooperative Institute for Research in the Atmosphere. IMPROVE 5-year Averages and 2064 Estimated Natural Conditions. Light Extinction: Average Most Impaired Days. Utah. Internet website: <https://views.cira.colostate.edu/tssv2>.
- \_\_\_\_\_. 2023b. Western Regional Air Partnership Technical Support System. Colorado State University and the Cooperative Institute for Research in the Atmosphere. IMPROVE 5-year Averages and 2064 Estimated Natural Conditions. Light Extinction: Average Clearest Days. Utah. Internet website: <https://views.cira.colostate.edu/tssv2>.
- \_\_\_\_\_. 2023c. Western Regional Air Partnership Technical Support System. Colorado State University and the Cooperative Institute for Research in the Atmosphere. 2028 Visibility Projection. Utah. Internet website: <https://views.cira.colostate.edu/tssv2>.
- Climate Change*
- BLM (United States Department of the Interior, Bureau of Land Management). 2018. Analysis of the Management Situation – Grand Staircase-Escalante National Monument and Kanab-Escalante Planning Area. June. Internet website: [https://eplanning.blm.gov/public\\_projects/lup/94706/154274/188891/GSKRMP\\_Analysis\\_of\\_Mngt\\_Situation\\_2018\\_0711\\_508.pdf](https://eplanning.blm.gov/public_projects/lup/94706/154274/188891/GSKRMP_Analysis_of_Mngt_Situation_2018_0711_508.pdf).
- \_\_\_\_\_. 2022. 2021 BLM Specialist Report on Annual Greenhouse Gas Emissions and Climate Trends from Coal, Oil, and Gas Exploration and Development on the Federal Mineral Estate. Internet website: <https://www.blm.gov/content/ghg/2021/>.
- BLM GIS (United States Department of the Interior, Bureau of Land Management geographic information system). 2022. GIS data used in the GSENM alternatives, affected environment, and impact analysis. Kanab, Utah. Last edited April 19, 2024.
- Bryce, S. A., J. R. Strittholt, B. C. Ward, and D. M. Bachelet. 2012. Colorado Plateau Rapid Ecoregional Assessment Report. Prepared for the United States Department of the Interior, Bureau of Land Management, Denver, Colorado.

- Chen, W., D. Huang, N. Liu, Y. Zhang, W. B. Badgery, X. Wang, and Y. Shen. 2015. "Improved grazing management may increase soil carbon sequestration in temperate steppe." *Scientific Reports* 5(10892). DOI: 10.1038/srep10892. Internet website: <https://link.springer.com/content/pdf/10.1038/srep10892.pdf>.
- Frankson, R., K. E. Kunkel, L. E. Stevens, and D. R. Easterling. 2022. Utah State Climate Summary 2022. NOAA Technical Report NESDIS 150-UT. NOAA/NESDIS, Silver Spring, Maryland. Internet website: <https://statesummaries.ncics.org/chapter/ut/>.
- Gonzalez, P., G. M. Garfin, D. D. Breshears, K. M. Brooks, H. E. Brown, E. H. Elias, A. Gunasekara, et al. 2018. "Southwest." In *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* (D. R. Reidmiller, C. W. Avery, D. R. Easterling, K. E. Kunkel, K. L. M. Lewis, T. K. Maycock, and B. C. Stewart, eds.). U.S. Global Change Research Program, Washington, DC. Pp. 1101–1184. Internet website: <https://doi.org/10.7930/NCA4.2018.CH25>.
- IPCC (Intergovernmental Panel on Climate Change). 2018. "Summary for Policymakers." In: *Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty* (V. Masson-Delmotte, P. Zhai, H. O. Pörtner, D. Roberts, J. Skea, P. R. Shukla, A. Pirani, et al. [eds.]). Cambridge University Press, Cambridge, UK and New York, NY. Pp. 3–24. Internet website: <https://doi.org/10.1017/9781009157940.001>.
- \_\_\_\_\_. 2021. "Summary for Policymakers." In: *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (V. Masson-Delmotte, P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, et al. [eds.]). Cambridge University Press, Cambridge, United Kingdom and New York, NY. Pp. 3–32. Internet website: <https://doi.org/10.1017/9781009157964.001>.
- IWG (U.S. Interagency Working Group on Social Cost of Greenhouse Gases). 2021. Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under Executive Order 13990. Internet website: [https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument\\_SocialCostofCarbonMethaneNitrousOxide.pdf](https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf).
- Kauffman, B. J., R. L. Beschta, P. M. Lacy, and M. Liverman. 2022. "Livestock use on public lands in the western USA exacerbates climate change: Implications for climate change mitigation and adaptation." *Environmental Management* 69:1137–1152. Internet website: <https://doi.org/10.1007/s00267-022-01633-8>.
- Merrill, M. D., B. M. Sleeter, P. A. Freeman, J. Liu, P. D. Warwick, and B. C. Reed. 2018. Federal Lands Greenhouse Gas Emissions and Sequestration in the United States: Estimates for 2005–14. U.S. Geological Survey Scientific Investigations Report 2018-5131. Internet website: <https://pubs.er.usgs.gov/publication/sir20185131>.



- Miller, R. F., S. T. Knick, D. A. Pyke, C. W. Meinke, S. E. Hanser, M. J. Wisdom, and A. L. Hild. 2011. "Characteristics of sagebrush habitats and limitations to long-term conservation." In *Greater sage-grouse: Ecology and conservation of a landscape species and its habitats* (S. T. Knick and J. W. Connelly, editors). *Studies in Avian Biology* 38. University of California Press, Berkeley, California. Pp. 145–184.
- National Aeronautics and Space Administration. 2022. Goddard Institute for Space Studies. 2021 Tied for 6th Warmest Year in Continued Trend, NASA Analysis Shows. Internet website: <https://www.nasa.gov/press-release/2021-tied-for-6th-warmest-year-in-continued-trend-nasa-analysis-shows>.
- U.S. Energy Information Administration. 2022. Energy and the Environment Explained. Where Greenhouse Gases Come From. Internet website: [https://www.eia.gov/energyexplained/index.cfm?page=environment\\_where\\_ghg\\_come\\_from](https://www.eia.gov/energyexplained/index.cfm?page=environment_where_ghg_come_from).
- Vose, R. S., D. R. Easterling, K. E. Kunkel, A. N. LeGrande, and M. F. Wehner. 2017. "Temperature changes in the United States." In: *Climate Science Special Report: Fourth National Climate Assessment, Volume I* (D. J. Wuebbles, D. W. Fahey, K. A. Hibbard, D. J. Dokken, B. C. Stewart, and T. K. Maycock, eds.). U.S. Global Change Research Program, Washington, DC. Internet website: <https://doi.org/10.7930/J0N29V45>.
- Wiedinmyer, C., and M. D. Hurteau. 2010. "Prescribed fire as a means of reducing forest carbon emissions in western United States." *Environmental Science & Technology* 44(6):1926–1932. Internet website: <https://pubs.acs.org/doi/10.1021/es902455e>.
- Ypsilantis, G. W. 2003. "Risk of cheatgrass invasion after fire in selected sagebrush community types." In: *Resource Notes*. Bureau of Land Management. National Science and Technology Center. Denver, CO. No. 63. Internet website: [https://www.blm.gov/sites/default/files/documents/files/Library\\_BLMResourceNote63.pdf](https://www.blm.gov/sites/default/files/documents/files/Library_BLMResourceNote63.pdf).
- Soil Resources*
- Abdalla, M., A. Hastings, D. R. Chadwick, D. L. Jones, C. D. Evans, M. B. Jones, R. M. Rees, and P. Smith. 2018. "Critical review of the impacts of grazing intensity on soil organic carbon storage and other soil quality indicators in extensively managed grasslands." *Agriculture, Ecosystems and Environment* 253:62–81.
- Belnap, J. 1995. "Potential role of cryptobiotic soil crusts in semiarid rangelands." In: *Symposium on Ecology, Management, and Restoration of Intermountain Annual Rangelands, United States* Forest Service, General Technical Report INT-GTR-313. General Technical Report INT-GTR-313. Washington, DC: DOI-US Forest Service. Pp. 179–185.
- Belnap, J., S. L. Phillips, J. E. Herrick, and J. R. Johansen. 2007. "Wind erodibility of soils at Fort Irwin, California (Mojave Desert), USA, before and after trampling disturbance: Implications for land management." *Earth Surface Processes and Landforms* 32:75–84.

- Belnap, J., R. Rosentreter, S. Leonard, J. H. Kaltenecker, J. Williams, and D. Eldridge. 2001. Biological Soil Crusts: Ecology and Management. Technical Reference 1730-2. Prepared for the U.S. Department of the Interior, Bureau of Land Management, U.S. Geological Survey, Denver, Colorado. BLM/ID/ST-01/001+1730.
- BLM (United States Department of the Interior, Bureau of Land Management). 2018. Analysis of the Management Situation – Grand Staircase-Escalante National Monument and Kanab-Escalante Planning Area. June. Internet website: [https://eplanning.blm.gov/public\\_projects/lup/94706/154274/188891/GSKRMP\\_Analysis\\_of\\_Mngt\\_Situation\\_2018\\_0711\\_508.pdf](https://eplanning.blm.gov/public_projects/lup/94706/154274/188891/GSKRMP_Analysis_of_Mngt_Situation_2018_0711_508.pdf).
- \_\_\_\_\_. 2020a. Record of Decision and Approved Resource Management Plans for the Grand Staircase-Escalante National Monument. Internet website: [https://eplanning.blm.gov/public\\_projects/lup/94706/20012470/250017029/GSENM\\_ROD\\_and\\_ARMPs\\_February2020.pdf](https://eplanning.blm.gov/public_projects/lup/94706/20012470/250017029/GSENM_ROD_and_ARMPs_February2020.pdf).
- \_\_\_\_\_. 2020b. Record of Decision and Approved Resource Management Plan for the Kanab-Escalante Planning Area. February. Internet website: [https://eplanning.blm.gov/public\\_projects/lup/94706/20012472/250017031/KEPA\\_ROD\\_and\\_ARMP\\_February2020.pdf](https://eplanning.blm.gov/public_projects/lup/94706/20012472/250017031/KEPA_ROD_and_ARMP_February2020.pdf).
- BLM GIS (United States Department of the Interior, Bureau of Land Management geographic information system). 2022. GIS data used in the GSENM alternatives, affected environment, and impact analysis. Kanab, Utah. Last edited April 19, 2024.
- Bowker, Matthew A., Jayne Belnap, and Mark E. Miller. 2006. “Spatial modeling of biological soil crusts to support rangeland assessment and monitoring.” *Rangeland Ecology and Management* 5.
- Bryce, S. A., J. R. Strittholt, B. C. Ward, and D. M. Bachelet. 2012. Colorado Plateau Rapid Ecoregional Assessment Report. Prepared for the United States Department of the Interior, Bureau of Land Management, Denver, Colorado.
- Chaudhary, V. B., M. A. Bowker, T. E. O’Dell, J. B. Grace, A. E. Redman, M. C. Rillig, and N. C. Johnson. 2009. “Untangling the biological contributions to soil stability in semiarid shrublands.” *Ecological Applications* 19(1):110–122.
- Chiquoine, L. P., S. R. Abella, and M. A. Bowker. 2016. “Rapidly restoring biological soil crusts and ecosystem functions in a severely disturbed desert ecosystem.” *Ecological Applications* 26(4):1260–1272.
- Concostrina-Zubiri, L., et al. 2014. “Biological Soil Crusts across Disturbance–Recovery Scenarios: Effect of Grazing Regime on Community Dynamics.” *Ecological Applications* 24(7):1863–1877. Internet website: <http://www.jstor.org/stable/24432278>.
- Johansen, J. R. 2003. Impacts of fire on biological soil crusts. In: Biological soil crusts: Structure, function, and management, pp. 385–397.
- Moody, J. A., and D. A. Martin. 2001. “Post-fire, rainfall intensity—peak discharge relations for three mountainous watersheds in the western USA.” *Hydrological Processes* 15(15):2981–2993.

- \_\_\_\_\_. 2009. "Synthesis of sediment yields after wildland fire in different rainfall regimes in the western United States." *International Journal of Wildland Fire* 18(1):96–115.
- Moody, J. A., D. A. Martin, S. L. Haire, and D. A. Kinner. 2008. "Linking runoff response to burn severity after a wildfire." *Hydrological Processes: An International Journal* 22(13):2063–2074.
- Miller, M. E. 2008. "Broad-scale assessment of rangeland health, Grand Staircase-Escalante National Monument, USA." *Rangeland Ecology and Management* 61:249–262.
- Nauman, T. W., S. S. Burch, J. T. Humphries, A. C. Knight, and M. C. Duniway. 2022. "A Quantitative Soil-Geomorphic Framework for Developing and Mapping Ecological Site Groups." *Rangeland Ecology and Management* 81:9–33.
- Neff, J. C., R. L. Reynolds, J. Belnap, and P. Lamothe. 2005. "Multi-decadal impacts of grazing on soil physical and biogeochemical properties in southeast Utah." *Ecological Applications* 15(1):87–95.
- NRCS (United States Department of Agriculture, Natural Resources Conservation Service). 2023. Web Soil Survey. Internet website: <http://websoilsurvey.sc.egov.usda.gov/>.
- Pouyat, R. V., D. S. Page-Dumroese, T. Patel-Weynand, and L. H. Geiser. 2020. *Forest and Rangeland Soils of the United States Under Changing Conditions A Comprehensive Science Synthesis*. Springer International Publishing. Internet website: <http://dx.doi.org/10.1007/978-3-030-45216-2>.
- Von Reis, J. C. 2015. The effects of select herbicides on the biological soil crust in shrub steppe areas of the Columbia Basin, Washington. Ph.D. Dissertation, Washington State University, Pullman.
- Woods, S. W., A. Birkas, and R. Ahl. 2007. "Spatial variability of soil hydrophobicity after wildfires in Montana and Colorado." *Geomorphology* 86:465–479.
- Vegetation, Including Special Status Plants*
- Aldrich, G. A., et al. 2005. Economics of Western Juniper Control in Central Oregon. *Rangeland Ecology and Management* 58(5):542–552.
- Balch, J. K., B. A. Bradley, C. M. D'Antonio, and J. Gómez-Dans. 2013. "Introduced annual grass increases regional fire activity across the arid western USA (1980–2009)." *Global Change Biology* 19:173–183.
- Bartos, D. L. 2001. Landscape Dynamics of Aspen and Conifer Forests. U.S. Department of Agriculture, Forest Service Proceedings. Rocky Mountain Research Station.
- Belksy, A. Joy and D. M. Blumenthal. 1997. Effects of Livestock Grazing on Stand Dynamics and Soils in Upland Forests of the Interior West. *Conservation Biology* 11(2):315–327. Internet website: [https://www.fs.usda.gov/rm/pubs/rmrs\\_gtr292/1997\\_belksy.pdf](https://www.fs.usda.gov/rm/pubs/rmrs_gtr292/1997_belksy.pdf).
- Benton, N., J. Fleckenstein, A. Frances, and A. Treher. 2016. Estimating the Effect of BLM Treatment Types on Endangered, Threatened, and Sensitive Species in Sagebrush Habitats. NatureServe, Arlington, Virginia. Final Report for the U.S. Bureau of Land Management.

- BLM (United States Department of the Interior, Bureau of Land Management). 2008. BLM Handbook H-1740-2, Integrated Vegetation Management Handbook. Washington, DC.
- \_\_\_\_\_. 2016. Rangeland Resource Assessment–2011. National Operations Center. September 2016. Denver, Colorado.
- \_\_\_\_\_. 2018. Analysis of the Management Situation – Grand Staircase-Escalante National Monument and Kanab-Escalante Planning Area. June. Internet website: [https://eplanning.blm.gov/public\\_projects/lup/94706/154274/188891/GSKRMP\\_Analysis\\_of\\_Mngt\\_Situation\\_2018\\_0711\\_508.pdf](https://eplanning.blm.gov/public_projects/lup/94706/154274/188891/GSKRMP_Analysis_of_Mngt_Situation_2018_0711_508.pdf).
- \_\_\_\_\_. 2022. 2021 BLM Specialist Report on Annual Greenhouse Gas Emissions and Climate Trends from Coal, Oil, and Gas Exploration and Development on the Federal Mineral Estate. Internet website: <https://www.blm.gov/content/ghg/2021/>.
- BLM GIS (United States Department of the Interior, Bureau of Land Management geographic information system). 2022. GIS data used in the GSENM alternatives, affected environment, and impact analysis. Kanab, Utah. Last edited April 19, 2024.
- Breshears, D. D., N. S. Cobb, P. M. Rich, K. P. Price, C. D. Allen, R. G. Balice, W. H. Romme, et al. 2005. “Regional vegetation die-off in response to global-change-type drought.” *Proceedings of the National Academy of Sciences* 102(42):15144–15148.
- Briske, D. D., S. D. Fuhlendorf, and F. E. Smeins. 2006. “A Unified Framework for Assessment and Application of Ecological Thresholds.” *Rangeland Ecology Management* 59:225–236.
- Brooks, M. L., C. M. D’Antonio, D. M. Richardson, J. B. Grace, J. E. Keeley, J. M. DiTomaso, R. J. Hobbs, et al. 2004. “Effects of Invasive Alien Plants on Fire Regimes.” *BioScience* 54(7):677–688.
- Bryce, S. A., J. R. Strittholt, B. C. Ward, and D. M. Bachelet. 2012. Colorado Plateau Rapid Ecoregional Assessment Report. Prepared for the U.S. Department of the Interior, Bureau of Land Management, Denver, Colorado.
- Connelly, J. W., M. A. Schroeder, A. R. Sands, and C. E. Braun. 2000. “Guidelines to manage sage-grouse populations and their habitats.” *Wildlife Society Bulletin* 28(4):967–985.
- D’Antonio, C. M. and P. M. Vitousek. 1992. “Biological invasions by exotic grasses, the grass/fire cycle, and global change.” *Annual Review of Ecology and Systematics* 23:63–87.
- Davies, T.W., S.R. Jenkins, R. Kingham, J. Kenworthy, S. J. Hawkins, et al. 2011a. “Dominance, Biomass and Extinction Resistance Determine the Consequences of Biodiversity Loss for Multiple Coastal Ecosystem Processes.” *PLoS ONE* 6(12):e28362. Internet website: doi:10.1371/journal.pone.0028362.
- Davies, K. W., J. D. Bates, and A. M. Nafus. 2011b. “Are there benefits to mowing Wyoming big sagebrush plant communities? An evaluation in southeastern Oregon.” *Environmental Management* 48:539–546.

- Duniway, M. C, E. L. Geiger, T. J. Minnick, S. L. Phillips, and J. Belnap. 2018. "Insights from long-term ungrazed and grazed watersheds in a salt desert Colorado Plateau ecosystem." *Rangeland Ecology and Management* 71:492–505.
- Forest Service (United States Department of Agriculture, Forest Service). 2022. "Passive or Active Management? Understanding Consequences and Changes After Large-Stand Replacing Wildfires." *Science Findings* 247:1–6.
- Fuhlendorf, S. D., S. A. Archer, F. Smeins, D. M. Engle, and C. A. Taylor. 2008. The Combined Influence of Grazing, Fire, and Herbaceous Productivity on Tree–Grass Interactions. In: Van Auken, O.W. (eds) *Western North American Juniperus Communities*. Ecological Studies vol. 196. Springer, New York, NY. Internet website: [https://doi.org/10.1007/978-0-387-34003-6\\_12](https://doi.org/10.1007/978-0-387-34003-6_12).
- Gray, E. C. and P. S. Muir. 2013. "Does Kochia prostrata spread from seeded sites? An evaluation from southwestern Idaho, USA." *Rangeland Ecology and Management* 66(2):191–203.
- Guenther, D., T. J. Stohlgren, and P. Evangelista. 2004. "A comparison of a near-relict site and a grazed site in a pinyon-juniper community in the Grand Staircase–Escalante National Monument, Utah." *The Colorado Plateau: Cultural, Biological and Physical Research* (C. Van Riper and K. L. Cole, editors). University of Arizona Press, Tucson. Pp. 153–162.
- Herrick, J. E., J. W. Van Zee, S. E. McCord, E. M. Courtright, J. W. Karl, and L. M. Burkett. 2021. *Monitoring Manual for Grassland, Shrubland, and Savanna Ecosystems. Volume I: Core Methods*. USDA-ARS Jornada Experimental Range. Las Cruces, New Mexico.
- Jones, B. E., D. F. Lile, and K. W. Tate. 2009. "Effect of simulated browsing on aspen regeneration: Implications for restoration." *Rangeland Ecology and Management* 62(6):557–563. Internet website: <https://doi.org/10.2111/1/REM-D-09-00082.1>.
- Karl, M. G. "Sherm," E. Kachergis, and J. W. Karl. 2016. *Bureau of Land Management Rangeland Resource Assessment—2011*. U.S. Department of the Interior, Bureau of Land Management, National Operations Center, Denver, Colorado.
- Knick, S. T. et al. 2003. "Teetering on the edge or too late? Conservation and research for avifauna of sagebrush habitat." *The Condor* 105(4):611–634. Internet website: <https://doi.org/10.1650/7329>.
- LANDFIRE. 2022. Existing Vegetation Type. Internet website: <https://www.landfire.gov/evt.php>.
- MacKinnon, W. C. et al. 2011. *BLM Core Terrestrial Indicators and Methods*. Tech Note 440. U.S. Department of the Interior, Bureau of Land Management, National Operations Center, Denver, Colorado.
- Maestas, J., M. Jones, N. J. Pastick, M. B. Rigge, B. K. Wylie, L. Garner, M. Crist, et al. 2020. Annual Herbaceous Cover across Rangelands of the Sagebrush Biome: U.S. Geological Survey data release. Internet website <https://doi.org/10.5066/P9VL3LD5>.

- McArthur, E. D., A. C. Blauer, and R. Stevens. 1990. Forage kochia competition with cheatgrass in central Utah. In Proceedings – Symposium on cheatgrass invasion, shrub die-off, and other aspects of shrub biology and management. April 5–9, 1989. Las Vegas, Nevada and Ogden, Utah. U.S. Department of Agriculture, Forest Service, Intermountain Research Station. Pp. 56–65.
- Miller, R. F. and P. E. Wigand. 1994. “Holocene Changes in Semiarid Pinyon-Juniper Woodlands.” *BioScience* 44(7):465–474.
- Miller, R. F., R. J. Tausch, E. D. McArthur, D. D. Johnson, and S. C. Sanderson. 2008. Age structure and expansion of piñon-juniper woodlands: a regional perspective in the Intermountain West. Research Paper RMRS-RP-69. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fort Collins, Colorado.
- Miller, R. F., J. C. Chambers, D. A. Pyke, F. B. Pierson, and C. J. Williams. 2013. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station-GTR-308: A Review of Fire Effects on Vegetation and Soils in the Great Basin Region: Response and Ecological Site Characteristics. Internet website [http://sagestep.org/pdfs/rmrs\\_gtr308.pdf](http://sagestep.org/pdfs/rmrs_gtr308.pdf).
- Miller, R. M., J. C. Chambers, and M. Pellant. 2015. A field guide for rapid assessment of post-wildfire recovery potential in sagebrush and piñon juniper ecosystems in the Great Basin: evaluating resilience to disturbance and resistance to invasive annual grasses and predicting vegetation response. Gen. Tech. Rep. Rocky Mountain Research Station-GTR-338. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fort Collins, Colorado. Internet website: [https://www.fs.usda.gov/rm/pubs/rmrs\\_gtr338.pdf](https://www.fs.usda.gov/rm/pubs/rmrs_gtr338.pdf).
- Monsen, S. B., R. Stevens, N. L. Shaw (compilers). 2004. Restoring western ranges and wildlands. General Technical Report 136, Vol. 1, 2, 3, pp. 1–884. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fort Collins, Colorado.
- Munson, S. M., J. Belnap, C. D. Schelz, M. Moran, and T. W. Carolin. 2011. “On the brink of change: Plant responses to climate on the Colorado Plateau.” *Ecosphere* 2(6).
- NatureServe. 2009. International Ecological Classification Standard: Terrestrial Ecological Classifications. NatureServe Central Databases. Arlington, Virginia.
- Nauman, T. W., S. S. Burch, J. T. Humphries, A. C. Knight, and M. C. Duniway. 2022. “A Quantitative Soil-Geomorphic Framework for Developing and Mapping Ecological Site Groups.” *Rangeland Ecology and Management* 81:9–33.
- Natural Resources Conservation Service. 2022. Ecological Site Descriptions. Internet website: <https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/ecoscience/desc/>.
- O’Brien, R. A. 1999. Comprehensive inventory of Utah’s forest resources, 1993. Resource Bulletin RMRS-RB-1, p. 105. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Ogden, Utah.

- Pierson, Frederick B., et al. 2007. "Runoff and Erosion After Cutting Western Juniper." *Rangeland Ecology and Management* 60(3):285–292.
- Pierson, Frederick B., C. Jason Williams, Patrick R. Kormos, Patrick E. Clark, and Stuart P. Hardegree. 2010. "Hydrologic Vulnerability of Sagebrush-steppe Following Pinyon and Juniper Encroachment." *Rangeland Ecology and Management* 63(6):614–629.
- Rangeland Analysis Platform. 2022. Rangeland Analysis Platform version 3.0. Internet website: <https://rangelands.app/>.
- Romme, W. H., C. D. Allen, J. D. Bailey, W. L. Baker, B. T. Bestelmeyer, P. M. Brown, K. S. Eisenhart, et al. 2019. "Historical and modern disturbance regimes, stand structures, and landscape dynamics in pinyon-juniper vegetation of the western United States." *Rangeland Ecology and Management* 62:203–222.
- SEINet. 2022. Arizona – New Mexico Chapter, Welcome to SEINet. Internet website: <https://swbiodiversity.org/index.php>.
- Smith, D. C., S. E. Meyer, and V. J. Anderson. 2008. "Factors Affecting Bromus tectorum Seed Bank Carryover in Western Utah." *Rangeland Ecology and Management* 61:430–436.
- Smith, M. D. et al. 2024. "Extreme drought impacts have been underestimated in grasslands and shrublands globally." *Proceedings of the National Academy of Science* 124(4), e2309881120. Internet website: <https://doi.org/10.1073/pnas.2309881120>.
- Tausch, R. J., N. E. West, and A. A. Nabi. 1981. "Tree Age and Dominance Patterns in Great Basin Pinyon-Juniper Woodlands." *Journal of Range Management* 34(4):259–264.
- UDWR (Utah Division of Wildlife Resources). 1998. Inventory of Sensitive Species and Ecosystems in Utah. Endemic and Rare Plants of Utah: An Overview of Their Distribution and Status. State of Utah, Department of Natural Resources, Division of Wildlife Resources. June 1998.
- USFWS (United States Department of the Interior, Fish and Wildlife Service). 2013. Greater Sage-Grouse Conservation Objectives Final Report.
- \_\_\_\_\_. 2022. Species list generated for the Grand Staircase-Escalante National Monument RMP/EIS Project from the Information for Planning and Consultation website. Queried for the project area on June 27, 2022.
- Webb, N. P., J. E. Herrick, and M. C. Duniway. 2014. "Ecological site-based assessments of wind and water erosion: informing accelerated soil erosion management in rangelands." *Ecological Applications* 24(6):1405–1420.
- West, N. E. 2000. Synecology and disturbance regimes of sagebrush steppe ecosystems, pp. 15–26. In P. G. Entwistle, A. M. DeBolt, J. H. Kaltenecker, and K. Steenhof [compilers], *Proceedings: sagebrush steppe ecosystems symposium*. U.S. Department of the Interior, Bureau of Land Management Publication BLM/ID/PT00100111150, Boise, Idaho.

- Williamson, M. A., E. Fleishman, R. C. Mac Nally, et al. 2020. “Fire, livestock grazing, topography, and precipitation affect occurrence and prevalence of cheatgrass (*Bromus tectorum*) in the central Great Basin, USA.” *Biol Invasions* 22, 663–680. Internet website: <https://doi.org/10.1007/s10530-019-02120-8>.
- Winkler, D. E., J. Belnap, D. Hoover, S C. Reed, and M. C. Duniway. 2019. “Shrub persistence and increased grass mortality in response to drought in dryland systems.” *Global Change Biology* 25:3121–3135.
- Zouhar, K. 2003. “*Bromus tectorum*.” Fire Effects Information System. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Internet website: <https://www.fs.fed.us/database/feis/plants/graminoid/brotec/all.html>.
- Water Resources*
- BLM (United States Department of the Interior, Bureau of Land Management). 1974. Colorado River Basin Salinity Control Act. Internet website: <https://www.congress.gov/bill/93rd-congress/house-bill/12165>.
- \_\_\_\_\_. 1999. Escalante Management Framework Plan Approved Amendment and Decision Record. BLM Utah State Office, Salt Lake City. March 15, 1999.
- \_\_\_\_\_. 2001. BLM Handbook H-4180-1—Rangeland Health Standards. Internet website: [https://www.blm.gov/sites/blm.gov/files/uploads/Media\\_Library\\_BLM\\_Policy\\_h4180-1.pdf](https://www.blm.gov/sites/blm.gov/files/uploads/Media_Library_BLM_Policy_h4180-1.pdf).
- \_\_\_\_\_. 2013. BLM Instruction Memorandum 2013-094—Resource Management During Drought. BLM, Washington Office, Washington, DC. Internet website: <https://www.blm.gov/policy/im-2013-094>.
- BLM (United States Department of the Interior, Bureau of Land Management). 2020a. Record of Decision and Approved Resource Management Plans for the Grand Staircase-Escalante National Monument. Internet website: [https://eplanning.blm.gov/public\\_projects/lup/94706/20012470/250017029/GSENM\\_ROD\\_and\\_ARMPs\\_February2020.pdf](https://eplanning.blm.gov/public_projects/lup/94706/20012470/250017029/GSENM_ROD_and_ARMPs_February2020.pdf).
- \_\_\_\_\_. 2020b. Record of Decision and Approved Resource Management Plan for the Kanab-Escalante Planning Area. February. Internet website: [https://eplanning.blm.gov/public\\_projects/lup/94706/20012472/250017031/KEPA\\_ROD\\_and\\_ARMP\\_February2020.pdf](https://eplanning.blm.gov/public_projects/lup/94706/20012472/250017031/KEPA_ROD_and_ARMP_February2020.pdf).
- \_\_\_\_\_. 2021. Assessment, Inventory, and Monitoring (AIM) National Aquatic Monitoring Framework: Field Protocol for Wadeable Lotic Systems. Tech Ref 1735-2, Version 2. U.S. Department of the Interior, Bureau of Land Management, National Operations Center, Denver, Colorado. Internet website: <https://www.blm.gov/sites/default/files/docs/2021-03/AIM%20National%20Aquatic%20Monitoring%20Framework%2C%20Field%20Protocol%20for%20Wadeable%20Lotic%20Systems%2C%20TRI1735-2.pdf>.
- \_\_\_\_\_. 2022. Water Quality Monitoring in the Grand Staircase-Escalante National Monument 2022 Water Year. Prepared for BLM, GSENM, by RedFish Environmental, LLC. Logan, Utah.



- BLM GIS (United States Department of the Interior, Bureau of Land Management geographic information system). 2022. GIS data used in the GSENM alternatives, affected environment, and impact analysis. Kanab, Utah. Last edited [April 19, 2024](#).
- Bryce, S. A., J. R. Strittholt, B. C. Ward, and D. M. Bachelet. 2012. Colorado Plateau Rapid Ecoregional Assessment Report. Prepared for the United States Department of the Interior, Bureau of Land Management, Denver, Colorado.
- Cline, N. L., B. A. Roundy, F. B. Pierson, P. Kormos, and W. C. Jason. 2010. "Hydrologic response to mechanical shredding in a juniper woodland." *Rangeland Ecology and Management* 63(4):467–477.
- Deboodt, T. L., M. P. Fisher, J. C. Buckhouse, and J. Swanson. 2008. Monitoring Hydrological Changes Related to Western Juniper Removal: A Paired Watershed Approach. *In: The Third Interagency Conference on Research in the Watersheds*. Estes Park, CO. September. Internet website: <https://pubs.usgs.gov/sir/2009/5049/pdf/Deboodt.pdf>.
- Escalante River Watershed Partnership. 2022. Riparian Restoration. Internet website: <http://escalanteriverwatershedpartnership.org/what-we-do/riparian-restoration-2/>.
- Freethy, G. W. 1997. "Hydrogeology and water resources of the Grand Staircase-Escalante National Monument." *In: Learning from the Land: Grand Staircase-Escalante National Monument Symposium Proceedings* (Linda H. Hill and Janine J. Koslak, editors). November 4 and 5, 1997, Southern Utah University. Bureau of Land Management, Utah State Office, Salt Lake City, Utah.
- Hudson, T. 2021. Livestock Management and Water Quality. Internet website: <http://pubs.cahnrs.wsu.edu/publications/wp-content/uploads/sites/2/publications/eb2021e.pdf>.
- Kachergis, E., N. Lepak, M. Karl, S. Miller, and Z. Davidson. 2020. Guide to Using AIM and LMF Data in Land Health Evaluations and Authorizations of Permitted Uses. Tech Note 453. U.S. Department of the Interior, Bureau of Land Management, National Operations Center, Denver, Colorado. Internet website: <https://www.blm.gov/sites/default/files/Guide%20to%20Using%20AIM%2007022020.pdf>.
- Millennium Science and Engineering. 2004. Paria River Watershed Water Quality Management Plan. Internet website: <https://deq.utah.gov/water-quality/watershed-monitoring-program/watershed-management-program>.
- \_\_\_\_\_. 2007. Escalante River Watershed Water Quality Management Plan. Internet website: <https://deq.utah.gov/water-quality/watershed-monitoring-program/watershed-management-program>.
- National Hydrography Datasets. 2023. USGS National Geospatial Program. Internet website: <https://www.usgs.gov/national-hydrography>.
- Pouyat, R. V., D. S. Page-Dumroese, T. Patel-Weynand, and L. H. Geiser. 2020. *Forest and Rangeland Soils of the United States Under Changing Conditions: A Comprehensive Science Synthesis*. Springer International Publishing. Internet website: <http://dx.doi.org/10.1007/978-3-030-45216-2>.

- Rice, S., and A. Springer. 2006. Use of Springs to Quantify Groundwater and Surface Water Interactions in the Escalante Basin. Internet website: <http://escalanteriverwatershedpartnership.org/wp-content/uploads/2017/09/Rice-and-Springer-2006-Use-of-springs-to-quantify-groundwater-and-surface-water-interactions-in-the-Escalante-Basin.pdf>.
- Robson, S. G., and E. R. Banta. 1995. Ground Water Atlas of the United States, Arizona, Colorado, New Mexico, Utah, HA 730-C. United States Geological Survey. Internet website: [http://pubs.usgs.gov/ha/ha730/ch\\_c/C-text8.html](http://pubs.usgs.gov/ha/ha730/ch_c/C-text8.html).
- Scott, M., L. Reynolds, P. Shafroth, and J. Spence. 2017. "The role of a non-native tree in riparian vegetation expansion and channel narrowing along a dryland river." *Ecohydrology* 2018;e1988. Internet website: [https://www.researchgate.net/profile/Lindsay-Reynolds-4/publication/325209712\\_The\\_role\\_of\\_a\\_non-native\\_tree\\_in\\_riparian\\_vegetation\\_expansion\\_and\\_channel\\_narrowing\\_along\\_a\\_dryland\\_river\\_Russian\\_olive\\_invasion\\_along\\_a\\_dryland\\_river/links/5cf6d9c5299b1fb185974a4/The-role-of-a-non-native-tree-in-riparian-vegetation-expansion-and-channel-narrowing-along-a-dryland-river-Russian-olive-invasion-along-a-dryland-river.pdf?origin=publication\\_detail](https://www.researchgate.net/profile/Lindsay-Reynolds-4/publication/325209712_The_role_of_a_non-native_tree_in_riparian_vegetation_expansion_and_channel_narrowing_along_a_dryland_river_Russian_olive_invasion_along_a_dryland_river/links/5cf6d9c5299b1fb185974a4/The-role-of-a-non-native-tree-in-riparian-vegetation-expansion-and-channel-narrowing-along-a-dryland-river-Russian-olive-invasion-along-a-dryland-river.pdf?origin=publication_detail).
- Spring Stewardship Institute. 2021. Developing a Spring and Groundwater Dependent Ecosystems Monitoring and Restoration Plan for Grand Staircase-Escalante National Monument, UT, 2021 Final Report. On file at SWCA Environmental Consultants, Salt Lake City, Utah.
- Sunrise Engineering. 2023. Hydrogeologic Study Kanab Creek and Johnson Canyon Basins. Internet website: <https://kcwcd.com/about-us/reports/#HG-study>.
- UDEQ (Utah Department of Environmental Quality). 2013. Utah Nonpoint Source Pollution Management Program, Fiscal Year 2012, Annual Report. In cooperation with NPS Task Force. January. Internet website: <https://documents.deq.utah.gov/legacy/programs/water-quality/non-point-source-management-program/docs/2013/04Apr/NPSannualreport2012.pdf#:~:text=In%20Fiscal%20Year%202012%20%28FY-12%29%20the%20Utah%20NPS,reduced%20by%207%25%20from%20the%20previous%20fiscal%20year>.
- UDWQ (Utah Department of Environmental Quality, Division of Water Quality). 2022. Final 2022 Integrated Report on Water Quality. Internet website: <https://documents.deq.utah.gov/water-quality/monitoring-reporting/integrated-report/DWQ-2022-002386.pdf>.
- University of Utah. 2023. MesoWest. Internet website: <https://mesowest.utah.edu/>.
- U.S. Department of Agriculture. 2022. Field Guide for Managing Russian Olive in the Southwest. Internet website: <https://rockvilleutah.org/wp-content/uploads/2020/07/Russian-Olive-mgmt.pdf>.
- Utah Division of Water Rights. 2011a. Area 97—Escalante River. Updated April 17, 2011. Internet website: <https://www.waterrights.utah.gov/wrinfo/policy/wrareas/area97.asp>.
- \_\_\_\_\_. 2011b. Area 89—Paria River. Updated April 17, 2011. Internet website: <https://www.waterrights.utah.gov/wrinfo/policy/wrareas/area89.asp>.

*Noxious Weeds and Invasive (Nonnative Plants)*

- BLM (United States Department of the Interior, Bureau of Land Management). 2006. Rangeland Health Determination. BLM, Grand Staircase-Escalante National Monument. Utah.
- \_\_\_\_\_. 2008. Handbook H-1740-2, Integrated Vegetation Management. BLM, Washington, DC.
- \_\_\_\_\_. 2015. Programmatic Noxious Weed and Invasive Plant Management Environmental Assessment. GSENM. August 2015. Kanab, Utah. Internet website: [https://eplanning.blm.gov/public\\_projects/ nepa/47141/62300/67542/2015\\_08\\_28\\_Programmatic\\_WeedEA\\_Final\\_\(508\).pdf](https://eplanning.blm.gov/public_projects/ nepa/47141/62300/67542/2015_08_28_Programmatic_WeedEA_Final_(508).pdf).
- \_\_\_\_\_. 2022. Assessment, Inventory, and Monitoring (AIM) and Landscape Monitoring Framework data, 2011–2021. Internet website: <https://gbp-blm-egis.hub.arcgis.com/pages/aim>.
- BLM GIS (United States Department of the Interior, Bureau of Land Management geographic information system). 2022. GIS data used in the GSENM alternatives, affected environment, and impact analysis. Kanab, Utah. Last edited April 19, 2024.
- Bradley, B. A., C. A. Curtis, and E. J. Fusco. 2018. “Cheatgrass (*Bromus tectorum*) distribution in the intermountain Western United States and its relationship to fire frequency, seasonality, and ignitions.” *Biol Invasions* 20:1493–1506. Internet website: <https://doi.org/10.1007/s10530-017-1641-8>.
- Briske, D. D., S. D. Fuhlendorf, and F. E. Smeins. 2006. “A unified framework for assessment and application of ecological thresholds.” *Rangeland Ecology Management* 59:225–236.
- Bryce, S. A., J. R. Strittholt, B. C. Ward, and D. M. Bachelet. 2012. Colorado Plateau Rapid Ecoregional Assessment Report. Prepared for the BLM, Denver, Colorado.
- Duniway, M. C., E. L. Geiger, T. J. Minnick, S. L. Phillips, and J. Belnap. 2018. “Insights from long-term ungrazed and grazed watersheds in a salt desert Colorado Plateau ecosystem.” *Rangeland Ecology and Management* 71:492–505.
- Edvarchuk, K., and C. Ransom. 2012. An Inventory of Noxious and Invasive Plants in Grand Staircase-Escalante National Monument – 2012 Final Report. Prepared for the Bureau of Land Management by Utah State University; Plants, Soils, and Climate; Weed Science Research Project Report No. CRI202A. Logan, Utah.
- Evangelista, P. H., T. J. Stohlgren, D. Guenther, and S. Stewart. 2004. “Vegetation response to fire and post-burn seeding treatments in juniper woodlands of the Grand Staircase–Escalante National Monument, Utah.” *Western North American Naturalist* 64:293–305.
- Forest Service (United States Department of Agriculture, Forest Service). 2022. “Passive or active management? Understanding consequences and changes after large stand-replacing wildfires.” *Science Findings* 247:1–6.

- Guenther, D., T. J. Stohlgren, and P. Evangelista. 2004. "A comparison of a near-relict site and a grazed site in a pinyon-juniper community in the Grand Staircase–Escalante National Monument, Utah." *In: The Colorado Plateau: Cultural, Biological and Physical Research* (C. Van Riper and K. L. Cole, editors). University of Arizona Press, Tucson. Pp. 153–162.
- Harris, A. T., G. P. Asner, and M. E. Miller. 2003. "Changes in vegetation structure after long-term grazing in pinyon-juniper ecosystems: Integrating imaging spectroscopy and field studies." *Ecosystems* 6:368–383.
- Havrilla, C. A., A. M. Faist, and N. N. Barger. 2017. "Understory plant community responses to fuel-reduction treatments and seeding in an upland piñon-juniper woodland." *Rangeland Ecology and Management* 70:609–620.
- Miller, R. F., T. J. Svejcar, and J. A. Rose. 2000. "Impacts of western juniper on plant community composition and structure." *Journal of Rangeland Management* 53:574–585.
- Prevéy, J. S., M. J. Geronimo, N. J. Huntly, and R. S. Inouye. 2010. "Exotic plants increase and native plants decrease with loss of foundation species in sagebrush steppe." *Plant Ecology* 207:39–51.
- Pyke, D. A., T. A. Wirth, and J. L. Beyers. 2013. "Does seeding after wildfires in rangelands reduce erosion or invasive species?" *Restoration Ecology* 21:415–421.
- Redmond, M. D., T. J. Zelikova, and N. N. Barger. 2014. "Limits to understory plant restoration following fuel-reduction treatments in a piñon-juniper woodland." *Environmental Management* 54:1139–1152.
- Reisner, M. D., J. B. Grace, D. A. Pyke, and P. S. Doescher. 2013. "Conditions favouring *Bromus tectorum* dominance of endangered sagebrush steppe ecosystems." *Journal of Applied Ecology* 50:1039–1049.
- Root, H. T., J. E. Miller, and R. Rosentreter. 2020. "Grazing disturbance promotes exotic annual grasses by degrading soil biocrust communities." *Ecological Applications* 30:e02016.
- Roundy, B. A., J. C. Chambers, D. A. Pyke, R. F. Miller, R. J. Tausch, E. W. Schupp, B. Rau, and T. Gruell. 2018. "Resilience and resistance in sagebrush ecosystems are associated with seasonal soil temperature and water availability." *Ecosphere* 9:e02417.
- Shinneman, D. J., and W. L. Baker. 2009. "Environmental and climatic variables as potential drivers of post-fire cover of cheatgrass (*Bromus tectorum*) in seeded and unseeded semiarid ecosystems." *International Journal of Wildland Fire* 18:191–202.
- Stohlgren, T. J., D. A. Guenther, P. H. Evangelista, and N. Alley. 2005. "Patterns of plant species richness, rarity, endemism, and uniqueness in an arid landscape." *Ecological Applications* 15:715–725.
- Stohlgren, T. J., M. Miller, P. Evangelista, A. Crall, D. Guenther, N. Alley, and M. Kalkhan. 2006. Landscape-scale assessment of Grand Staircase-Escalante National Monument. Learning from the Land – Grand Staircase-Escalante National Monument Science Symposium Proceedings. Southern Utah University Hunter Conference Center, Cedar City, Utah.

- Tausch, R. J., R. F. Miller, B. A. Roundy, and J. C. Chambers. 2009. "Piñon and juniper field guide: Asking the right questions to select appropriate management actions." *U.S. Geological Survey Circular* 1335. Reston, Virginia.
- Utah Weed Control Association. 2022. Utah's Noxious Weed List. Internet website: <https://utahweed.org/noxious-weeds/#WeedList>.
- Von Holle, B., and D. Simberloff. 2005. "Ecological resistance to biological invasion overwhelmed by propagule pressure." *Ecology* 86(12):3212–3218.
- Cultural Resources*
- BLM and NPS (United States Department of the Interior, Bureau of Land Management and United States Department of the Interior, National Park Service). 2017. Old Spanish National Historic Trail Final Comprehensive Administrative Strategy. Internet website: <https://parkplanning.nps.gov/document.cfm?documentID=83540>.
- BLM GIS (United States Department of the Interior, Bureau of Land Management geographic information system). 2022. GIS data used in the GSENM alternatives, affected environment, and impact analysis. Kanab, Utah. Last edited April 19, 2024.
- Davis, C. M. 2018. "Effects of Climate Change on Cultural Resources in the Northern Rockies Region." In *Climate Change Vulnerability and Adaptation in the Northern Rocky Mountains [Part 2]*. Jessica E. Halofsky, David L. Peterson, S. Karen Dante-Wood, Linh Hoang, Joanne J. Ho, and Linda A. Joyce, eds. Gen. Tech. Rep. RMRS-GTR-374. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fort Collins, Colorado. Pp. 462–468.
- Douglass, M., and L. Wandsnider. 2012. "Fragmentation resistant measures of chipped stone abundance and size: Results of an experimental investigation of the impact of cattle trampling on surface chipped stone scatters." *Plains Anthropologist* (57)244:353–365.
- Eren, M. I., A. Durant, C. Neudorf, M. Haslam, C. Shipton, J. Bora, R. Korisettar, et al. 2010. "Experimental examination of animal trampling effects on artifact movement in dry and water saturated substrates: A test case of South India." *Journal of Archaeological Science* (37):3010–3021.
- Hedquist, S. L., L. A. Ellison, and A. Laurenzi. 2014. "Public lands and archaeological resource protection: A case study of human impacts to archaeological sites on the Tonto National Forest, Arizona." *Advances in Archaeological Practice* 2(4):298–310.
- Howard, P. A. 2016. "Artefact disturbance in the New England tablelands: Elucidating the factors harming archaeological sites." Master's thesis, University of New England, Armidale, New South Wales.
- NPS (United States Department of the Interior, National Park Service). 2022. Hole-in-the-Rock Trail Traditional Cultural Property. National Register of Historic Places Registration Form. United States Department of the Interior, National Park Service, Washington, DC.

- \_\_\_\_\_. 2001. Cultural Resource Documents. Glen Canyon National Recreation Area. Manuscript on file at Glen Canyon National Recreation Area, Escalante, Utah.
- Nyaupane, G. P., D. D. White, and M. Budruk. 2006. "Motive-based tourist market segmentation: An application to Native American cultural heritage sites in Arizona, USA." *Journal of Heritage Tourism* 1(2):81–99.
- Osborn, A., S. Vetter, R. Hartley, L. Walsh, and J. Brown. 1987. Impacts of Domestic Livestock Grazing on the Archaeological Resources of Capitol Reef National Park, Utah. Midwest Archaeological Center Occasional Studies in Anthropology No. 20. U.S. Department of the Interior, National Park Service, Midwest Archaeological Center, Lincoln, Nebraska.
- Pinter, T. L., and M. L. Kwas. 2005. "Special issue: Archaeology and heritage tourism." *The SAA Archaeological Record* (5)3:9–44.
- Ryan, K. C. 2010. "Effects of Fire on Cultural Resources." In *Proceedings of the VI International Conference on Forest Fire Research* (D. X. Vegas, ed). November 15–18, 2010. University of Coimbra, Portugal.
- Spangler, J. D., A. T. Yentsch, and R. Green. 2010. Farming and Foraging on the Southwestern Frontier: An Overview of Previous Research of the Archaeological and Historical Resources of the Greater Cedar Mesa Area Vol. 9, no. 18. Utah Division of State History, Salt Lake City. Internet website: <https://research.libraries.wsu.edu/xmlui/handle/2376/2643>.
- Spangler, J. D., and M. K. Zweifel. 2021. Deep Roots: A 10,000-Year Indigenous History of the Grand Staircase-Escalante National Monument. Utah Bureau of Land Management, Cultural Resource Series No. 30. Grand Staircase-Escalante National Monument Special Publication No. 5. Escalante, Utah.
- Spangler, J. D., P. Yaworsky, K. B. Vernon, and B. F. Coddling. 2019. Hisat'sinom of the High Plateaus: The Prehistory of Grand Staircase-Escalante National Monument. Prepared for Grand Staircase-Escalante National Monument, Kanab, Utah by the Colorado Plateau Archaeological Alliance, Ogden, Utah, and the University of Utah Archaeological Center, Salt Lake City, Utah.
- Yaworsky, P. M., K. B. Vernon, and B. F. Coddling. 2018. The Grand Staircase-Escalante National Monument Cultural Resource Predictive Model. The University of Utah Archaeological Center. Document on File at Grand Staircase-Escalante National Monument, Bureau of Land Management Paria River District, Kanab, Utah.
- Yaworsky, P. M., K. B. Vernon, J. D. Spangler, S. C. Brewer, and B. F. Coddling. 2020. "Advancing predictive modeling in archaeology: An evaluation of regression and machine learning methods on the Grand Staircase-Escalante National Monument." *PLOS ONE* 15(10), Article e0239424.

Zweifel, M. K. 2016. Cultural Resource Site Condition and Trend Analysis: Results of 2011–2016 Grazing Allotment Survey and Monitoring at Grand Staircase-Escalante National Monument, with Additional Information from Glen Canyon National Recreation Area. Document on File at Grand Staircase-Escalante National Monument, Bureau of Land Management Paria River District, Kanab, Utah.

#### *Tribal Interests*

Begay, R. M. 2003. CONFIDENTIAL “Exploring Navajo - *Anaasázi* Relationships Using Traditional (Oral) Histories.” Unpublished master’s thesis, Northern Arizona University, Flagstaff.

Bernardini, W. 2005. CONFIDENTIAL Hopi Ethnographic Overview for the Grand Staircase-Escalante National Monument. Hopi Cultural Preservation Office. Kykotsmovi, Arizona. On file with Grand Staircase-Escalante National Monument.

Colwell-Chanthaphonh, C., S. Albert, W. Widener, and S. Kelley. 2011. CONFIDENTIAL Zuni Ethnographic Assessment of the Lake Powell Pipeline Project Area. Anthropological Research, LLC and Parametrix. On file with Grand Staircase-Escalante National Monument.

Dongoske, Kurt E., M. Yeatts, R. Anyon, and T. J. Ferguson. 1997. “Archaeological cultures and cultural affiliation: Hopi and Zuni perspectives in the American Southwest.” *American Antiquity* 62(4):600–608. Internet website: <https://www.resolutionmineeis.us/sites/default/files/references/dongoske-yeatts-anyon-ferguson-1997.pdf>.

Kelly, I. T. 1964. Southern Paiute Ethnography. Glen Canyon Series 21, University of Utah Anthropological Papers 69. Salt Lake City, Utah.

Molenaar, M., and R. Greaves. 2013. CONFIDENTIAL Lake Powell Pipeline Project Hopi Tribe Ethnographic Fieldwork Report. ASM affiliates, Salt Lake City, Utah. On file with Grand Staircase-Escalante National Monument.

NPS (United States Department of the Interior, National Park Service). 2022. Hole-in-the-Rock Trail Traditional Cultural Property. National Register of Historic Places Registration Form. United States Department of the Interior, National Park Service, Washington, DC.

Parker, P. L., and T. F. King. 1998. “Guidelines for Evaluating and Documenting Traditional Cultural Properties.” *National Register Bulletin* 38. Originally published 1990 (revised 1992), U.S. Department of the Interior, National Park Service, Washington, DC. Internet website: <https://www.nps.gov/subjects/nationalregister/upload/NRB38-Completenessweb.pdf>.

Sabata, D. M. 2018. “An analysis of culturally significant plants, springs, and archaeology at Grand Staircase-Escalante National Monument, Utah.” Unpublished master’s thesis, Northern Arizona University, Flagstaff.

Southern Paiute Advisory Committee. 2011. CONFIDENTIAL Southern Paiute Ethnographic Study Lake Powell Pipeline. Bureau of Applied Research in Anthropology, The University of Arizona, Tucson. On file with Grand Staircase-Escalante National Monument.

- Spangler, J. D., and M. K. Zweifel. 2021. Deep Roots: A 10,000-Year Indigenous History of the Grand Staircase-Escalante National Monument. Utah Bureau of Land Management, Cultural Resource Series No. 30. Grand Staircase-Escalante National Monument Special Publication No. 5. Escalante, Utah. Internet website: [https://permanent.fdlp.gov/gpo177780/Spangler%20\\_%20Zweifel%202021%20Deep%20Roots%20A%2010000%20Year%20Indigenous%20History%20of%20the%20GSENM%20-%20copy.pdf](https://permanent.fdlp.gov/gpo177780/Spangler%20_%20Zweifel%202021%20Deep%20Roots%20A%2010000%20Year%20Indigenous%20History%20of%20the%20GSENM%20-%20copy.pdf).
- Stoffle, R. W., A. K. Carroll, A. Eisenberg, and J. Amato. 2004. CONFIDENTIAL Ethnographic Assessment of Kaibab Paiute Cultural Resources In Grand Staircase-Escalante National Monument, Utah. Bureau of Applied Research in Anthropology, The University of Arizona, Tucson. On file with Grand Staircase-Escalante National Monument.
- Van Vlack, K. A. 2012. "Puaxant Tuvip: Powerlands Southern Paiute Cultural Landscapes and Pilgrimage Trails." Doctoral dissertation, The University of Arizona, Tucson. Internet website: <https://repository.arizona.edu/handle/10150/223332>.
- Paleontological and Geological Resources*
- BLM (United States Department of the Interior, Bureau of Land Management). 2000. Grand Staircase-Escalante National Monument Management Plan. February. Internet website: [https://eplanning.blm.gov/public\\_projects/2020343/200528424/20069859/250076041/2000%20GSENM%20Monument%20Management%20Plan.pdf](https://eplanning.blm.gov/public_projects/2020343/200528424/20069859/250076041/2000%20GSENM%20Monument%20Management%20Plan.pdf).
- \_\_\_\_\_. 2020a. Record of Decision and Approved Resource Management Plans for the Grand Staircase-Escalante National Monument Management. February. Internet website: [https://eplanning.blm.gov/public\\_projects/lup/94706/20012470/250017029/GSENM\\_ROD\\_and\\_ARMPs\\_February2020.pdf](https://eplanning.blm.gov/public_projects/lup/94706/20012470/250017029/GSENM_ROD_and_ARMPs_February2020.pdf).
- \_\_\_\_\_. 2020b. Record of Decision and Approved Resource Management Plan for the Kanab-Escalante Planning Area. February. Internet website: [https://eplanning.blm.gov/public\\_projects/lup/94706/20012472/250017031/KEPA\\_ROD\\_and\\_ARMP\\_February2020.pdf](https://eplanning.blm.gov/public_projects/lup/94706/20012472/250017031/KEPA_ROD_and_ARMP_February2020.pdf).
- BLM GIS (United States Department of the Interior, Bureau of Land Management geographic information system). 2022. GIS data used in the GSENM alternatives, affected environment, and impact analysis. Kanab, Utah. Last edited April 19, 2024.
- Titus, A. L., J. G. Eaton, and J. A. Sertich. 2016. "Late Cretaceous stratigraphy and vertebrate faunas of the Markagunt, Paunsaugunt, and Kaiparowits plateaus, southern Utah." *Geology of the Intermountain West* 3:229–291.
- Fish and Wildlife, Including Special Status Wildlife*
- Anderson, S. H. 1995. "Recreational disturbance and wildlife populations." In: *Wildlife and Recreationists*. Island Press. Washington, DC, pp.157–168.
- Barber, J. R., C. L. Burdett, S. E. Reed, K. A. Warner, C. Formichella, K. R. Crooks, D. M. Theobald, and K. M. Fristrup. 2011. "Anthropogenic noise exposure in protected natural areas: estimating the scale of ecological consequences." *Landscape Ecology* 26(9).



- Barnett, J. K., and J. A. Crawford. 1994. "Pre-laying nutrition of sage grouse hens in Oregon." *Journal of Range Management* 47:114–118.
- BLM (United States Department of the Interior, Bureau of Land Management). 2008a. Manual 6840—Special Status Species Management. U.S. Department of the Interior, Bureau of Land Management, Washington, DC.
- \_\_\_\_\_. 2008b. Grand Staircase-Escalante National Monument Draft Monument Management Plan Amendment and Draft Rangeland Health Environmental Impact Statement. BLM Grand Staircase-Escalante National Monument, Kanab, Utah. October.
- \_\_\_\_\_. 2019. Updated BLM Sensitive Species List for Utah. Internet website: <https://www.blm.gov/programs/fish-and-wildlife/threatened-and-endangered/state-te-data/utah>.
- BLM GIS (United States Department of the Interior, Bureau of Land Management geographic information system). 2022. GIS data used in the GSENM alternatives, affected environment, and impact analysis. Kanab, Utah. Last edited April 19, 2024.
- BLM and Forest Service (United States Department of the Interior, Bureau of Land Management and United States Department of Agriculture, Forest Service). 2015. Utah Greater Sage-Grouse Proposed Land Use Plan Amendment and Final Environmental Impact Statement. U.S. Department of the Interior, BLM, and U.S. Department of Agriculture, Forest Service. June.
- Bryce, S. A., J. R. Strittholt, B. C. Ward, and D. M. Bachelet. 2012. Colorado Plateau Rapid Ecoregional Assessment Report. Prepared for the United States Department of the Interior, Bureau of Land Management, Denver, Colorado.
- Connelly, J. W., S. T. Knick, M. A. Schroeder, and S. J. Stiver. 2004. Conservation Assessment of Greater Sage-grouse and Sagebrush Habitats. Western Association of Fish and Wildlife Agencies. Unpublished report. Cheyenne, Wyoming.
- Connelly, J. W., E. T. Rinkes, and C. E. Braun. 2011. Characteristics of greater sage-grouse habitats: A landscape species at micro- and macroscales. In: *Greater sage-grouse: Ecology of a landscape species and its habitats* (S. T. Knick and J. W. Connelly, editors). Cooper Ornithological Union. University of California Press, Berkeley. Pp. 69–83.
- Filazzola, A., C. Brown, M. A. Dettlaff, A. Batbaatar, J. Grenke, T. Bao, and J. F. Cahill, Jr. 2020. "The effects of livestock grazing on biodiversity are multi-trophic: A meta-analysis." *Ecology Letters* 23(8):1298–1309.
- Flinders, J. T., D. S. Rogers, J. L. Webber-Alston, and H. A. Barber. 2002. "Mammals of the Grand Staircase-Escalante National Monument: A literature and museum survey." *Monographs of the Western North American Naturalist* 1:1–64.
- Forest Service (United States Department of Agriculture, Forest Service). 2022. "Passive or active management? Understanding consequences and changes after large stand-replacing wildfires." *Science Findings* 247:1–6.

- Hebblewhite, M. and E. H. Merrill. 2009. Trade-offs between predation risk and forage differ between migrant strategies in a migratory ungulate. *Ecology* 90(12):3445–3454.
- Hockenbary, C. E. 2011. Exploring relationships among recreation, habitat type, and Mexican spotted owls on the Colorado Plateau in southern Utah. Doctoral dissertation, Montana State University, Bozeman.
- Kauffman, M.J., F. Cagnacci, S. Chamaillé-Jammes, M. Hebblewhite, J. G. C. Hopcraft, J. A. Merkle, T. Mueller, A. Mysterud, W. Peters, C. Roettger, and A. Steingisser. 2021. “Mapping out a future for ungulate migrations.” *Science* 372(6542):566–569.
- Messmer, T. A., and P. W. Klimack. 1999. Summer Habitat Use and Migration Movements of the Paunsaugunt Plateau Mule Deer Herd. Final report, submitted to the Arizona Game and Fish Department and Utah Division of Wildlife Resources. June.
- Monteith, K.L., V. C. Bleich, T. R. Stephenson, B. M. Pierce, M. M. Conner, R. W. Klaver, and R. T. Bowyer. 2011. “Timing of seasonal migration in mule deer: effects of climate, plant phenology, and life-history characteristics.” *Ecosphere* 2(4):1–34.
- Mueller, G., L. Boobar, R. Wydoski, K. Comella, R. Fridell, and Q. Bradwisch. 1999. Aquatic survey of the lower Escalante River, Glen Canyon National Recreation Area, Utah, conducted June 22–26, 1998.
- NorWest. 2014. Observed Stream Temperature Locations for Utah State-wide. Internet website: <https://www.fs.fed.us/rm/boise/AWAE/projects/NorWeST/utah-stream-temperature-data-scenarios.shtml>.
- Oliver, G. V. 2003. *Amphibians and Reptiles of the Grand Staircase-Escalante National Monument – Distribution, Abundance, and Taxonomy*. Prepared for BLM. February 26, 2003.
- Persons, T. B., and E. A. Nowak. 2018. Inventory of Amphibians and Reptiles for Twelve National Parks in the Southern Colorado Plateau. United States Geological Survey, Southwest Biological Science Center, Colorado Plateau Research Station, Northern Arizona University, Flagstaff, Arizona.
- Quy, R. 2010. “Review of evidence concerning the contamination of wildlife and the environment arising from the use of lead ammunition.” The Food and Environment Research Agency Report.
- Radle, A. L. 2007. “The effect of noise on wildlife: A literature review.” *World Forum for Acoustic Ecology Online Reader* 2:1-16.
- State of Utah. 2019. Utah Conservation Plan for Greater Sage-grouse. Internet website: [https://wildlife.utah.gov/sage-grouse/Utah\\_Greater\\_Sage-grouse\\_Plan.pdf](https://wildlife.utah.gov/sage-grouse/Utah_Greater_Sage-grouse_Plan.pdf).
- Stohlgren, T. J., D. A. Guenther, P. H. Evangelista, and N. Alley. 2005. “Patterns of plant species richness, rarity, endemism, and uniqueness in an arid landscape.” *Ecological Applications* 15:715–725.

- UDWR (Utah Department of Wildlife Resources). 2015a. Deer Herd Unit Management Plan, Deer Herd Unit #27 (Paunsaugunt). May.
- \_\_\_\_\_. 2015b. 2015 Annual monitoring and survey report for three fish species: bluehead sucker (*Catostomus discobolus*), flannelmouth sucker (*C. latipinnis*), and roundtail chub (*Gila robusta*). Publication Number 20-20, Utah Division of Wildlife Resources. Salt Lake City, Utah.
- \_\_\_\_\_. 2017. Utah Pronghorn Statewide Management Plan. Internet website: [https://wildlife.utah.gov/pdf/bg/pronghorn\\_plan.pdf](https://wildlife.utah.gov/pdf/bg/pronghorn_plan.pdf).
- \_\_\_\_\_. 2018. Utah Bighorn Sheep Statewide Management Plan. Internet website: <https://wildlife.utah.gov/pdf/bg/bighorn-plan.pdf>.
- \_\_\_\_\_. 2019a. Statewide Management Plan for Mule Deer. Internet website: [https://wildlife.utah.gov/pdf/bg/mule\\_deer\\_plan.pdf](https://wildlife.utah.gov/pdf/bg/mule_deer_plan.pdf).
- \_\_\_\_\_. 2019b. 2019 Annual monitoring and survey report for three fish species: bluehead sucker (*Catostomus discobolus*), flannelmouth sucker (*C. latipinnis*), and roundtail chub (*Gila robusta*). Publication Number 20-20, Utah Division of Wildlife Resources. Salt Lake City, Utah.
- \_\_\_\_\_. 2020. Utah Statewide Elk Management Plan. Internet website: [https://wildlife.utah.gov/pdf/bg/elk\\_plan.pdf](https://wildlife.utah.gov/pdf/bg/elk_plan.pdf).
- \_\_\_\_\_. 2022. 2022 Utah Greater Sage-grouse Lek Count Report: Lek Counts, Aerial Search, Adaptive Management Triggers. Internet website: <https://wildlife.utah.gov/sage-grouse/reports/lek-count-report-2022.pdf>.
- USFWS (United States Department of Interior, Fish and Wildlife Service). 2002. Final Recovery Plan Southwestern Willow Flycatcher (*Empidonax traillii extimus*). August. Prepared by Southwestern Willow Flycatcher Recovery Team Technical Subgroup. Internet website: [https://webapps.usgs.gov/mrgescp/documents/SWFL%20Recovery%20Team%20Technical%20Subgroup\\_2002\\_Final%20Recovery%20Plan%20SWFL%20\(Empidonax%20traillii%20extimus\).pdf](https://webapps.usgs.gov/mrgescp/documents/SWFL%20Recovery%20Team%20Technical%20Subgroup_2002_Final%20Recovery%20Plan%20SWFL%20(Empidonax%20traillii%20extimus).pdf).
- \_\_\_\_\_. 2012. Mexican Spotted Owl Recovery Plan, First Revision (*Strix occidentalis lucida*). September. Prepared by the Mexican Spotted Owl Recovery Team. Internet website: [https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/fseprd475767.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd475767.pdf).
- \_\_\_\_\_. 2021. Birds of Conservation Concern 2021.
- \_\_\_\_\_. 2023. Species list generated for the Grand Staircase-Escalante National Monument RMP/EIS Project from the Information for Planning and Consultation website. Queried for the project area on March 16, 2023.
- USGS (United States Geological Survey). 2017. Ecology and Conservation of Desert Bighorn Sheep. USGS, Western Ecological Research Center. Internet website: [https://www.usgs.gov/centers/werc/science/ecology-and-conservation-desert-bighorn-sheep?qt-science\\_center\\_objects=0#qt-science\\_center\\_objects](https://www.usgs.gov/centers/werc/science/ecology-and-conservation-desert-bighorn-sheep?qt-science_center_objects=0#qt-science_center_objects).

- Utah Department of Transportation. 2014. Utah Department of Transportation and Partners Work Together to Protect Paunsaugunt Mule Deer Herd. Internet website: <https://www.udot.utah.gov/connect/2014/09/22/udot-and-partners-work-together-to-protect-paunsaugunt-mule-deer-herd/>.
- Utah Wildlife Action Plan Joint Team. 2015. Utah Wildlife Action Plan: A plan for managing native wildlife species and their habitats to help prevent listing under the Endangered Species Act, 2015–2025. Publication number 15-14. Utah Division of Wildlife Resources, Salt Lake City, Utah.
- Vinson, M. R., and E. C. Dinger. 2008. “Aquatic invertebrates of the Grand Staircase-Escalante National Monument, Utah.” *The Southwestern Naturalist* 53(3):374–384.
- Wild Sheep Working Group. 2012. Recommendations for Domestic Sheep and Goat Management in Wild Sheep Habitat. Western Association of Fish and Wildlife Agencies.
- Willey, D. W. 2007. “Home range characteristics of Mexican spotted owls in the canyonlands of Utah.” *Journal of Raptor Research* 41(1):10–15.
- Willey, D. W., and H. C. Willey, 2010. “Ecology of small mammals within spotted owl nest areas in Grand Staircase-Escalante National Monument.” In *Learning from the land: Grand Staircase-Escalante National Monument Science Symposium Proceedings* 2:463–480.
- Wisdom, M. J., C. W. Meinke, S. T. Knick, and M. A. Schroeder. 2011. “Factors associated with extirpation of sage-grouse.” In *Greater sage-grouse: Ecology and conservation of a landscape species and its habitats*. *Studies in Avian Biology* 38:451–472. University of California Press, Berkeley.
- Visual Resources*
- BLM (United States Department of the Interior, Bureau of Land Management). 1984. Visual Resource Management. Manual 8400 Series. BLM, Washington, DC. Internet website: [https://www.blm.gov/sites/blm.gov/files/uploads/mediacenter\\_blmpolicymanual8400.pdf](https://www.blm.gov/sites/blm.gov/files/uploads/mediacenter_blmpolicymanual8400.pdf).
- \_\_\_\_\_. 1986a. Visual Resource Inventory. Manual H-8410-1. BLM, Washington, DC. Internet website: [https://www.blm.gov/sites/blm.gov/files/uploads/Media\\_Library\\_BLM\\_Policy\\_H-8410.pdf](https://www.blm.gov/sites/blm.gov/files/uploads/Media_Library_BLM_Policy_H-8410.pdf).
- \_\_\_\_\_. 1986b. Visual Resource Contrast Rating. Manual 8431-1. BLM, Washington, DC. Internet website: [https://www.blm.gov/sites/blm.gov/files/uploads/Media\\_Library\\_BLM\\_Policy\\_H8431.pdf](https://www.blm.gov/sites/blm.gov/files/uploads/Media_Library_BLM_Policy_H8431.pdf).
- \_\_\_\_\_. 2005. Land Use Planning Handbook. Handbook H-1601-1. BLM, Washington, DC. Internet website: [https://www.ntc.blm.gov/krc/uploads/360/4\\_BLM%20Planning%20Handbook%20H-1601-1.pdf](https://www.ntc.blm.gov/krc/uploads/360/4_BLM%20Planning%20Handbook%20H-1601-1.pdf).
- \_\_\_\_\_. 2019. Grand Staircase-Escalante National Monument Visual Resource Inventory. Grand Staircase-Escalante National Monument, Kanab, Utah.

- \_\_\_\_\_. 2020. Record of Decision and Approved Resource Management Plans for the Grand Staircase-Escalante National Monument. February. Internet website:  
[https://eplanning.blm.gov/public\\_projects/lup/94706/20012470/250017029/GSENM\\_ROD\\_and\\_ARMPs\\_February2020.pdf](https://eplanning.blm.gov/public_projects/lup/94706/20012470/250017029/GSENM_ROD_and_ARMPs_February2020.pdf).
- BLM GIS (United States Department of the Interior, Bureau of Land Management geographic information system). 2022. GIS data used in the GSENM alternatives, affected environment, and impact analysis. Kanab, Utah. Last edited April 19, 2024.
- Casey, T. 2018. A Monumental Sense of Place: Grand Staircase-Escalante National Monument Recreational Experience Baseline Study Phase 5: Monument-Wide Comprehensive Report. The Natural Resource Center at Colorado Mesa University. Internet website:  
<https://www.coloradomesa.edu/natural-resource-center/documents/gsenm-phase-5-final-report.pdf>.
- Dark Night Skies*
- BLM (United States Department of the Interior, Bureau of Land Management). 2020a. Record of Decision and Approved Resource Management Plans for the Grand Staircase-Escalante National Monument. February. Internet website:  
[https://eplanning.blm.gov/public\\_projects/lup/94706/20012470/250017029/GSENM\\_ROD\\_and\\_ARMPs\\_February2020.pdf](https://eplanning.blm.gov/public_projects/lup/94706/20012470/250017029/GSENM_ROD_and_ARMPs_February2020.pdf).
- \_\_\_\_\_. 2020b. Record of Decision and Approved Resource Management Plan for the Kanab-Escalante Planning Area. February. Internet website:  
[https://eplanning.blm.gov/public\\_projects/lup/94706/20012472/250017031/KEPA\\_ROD\\_and\\_ARMP\\_February2020.pdf](https://eplanning.blm.gov/public_projects/lup/94706/20012472/250017031/KEPA_ROD_and_ARMP_February2020.pdf).
- \_\_\_\_\_. 2023. Technical Memo 457 – Night Sky and Dark Environments: Best Management Practices for Artificial Light at Night on BLM-Managed Lands. Internet website:  
[https://www.blm.gov/sites/blm.gov/files/uploads/mediacenter\\_blmpolicymanual8400.pdf](https://www.blm.gov/sites/blm.gov/files/uploads/mediacenter_blmpolicymanual8400.pdf).
- BLM GIS (United States Department of the Interior, Bureau of Land Management geographic information system). 2022. GIS data used in the GSENM alternatives, affected environment, and impact analysis. Kanab, Utah. Last edited April 19, 2024.
- Falchi, F., P. Cinzano, D. Duriscoe, C. M. Kyba, C. D. Elvidge, K. Baugh, B. Portnov, et al. 2016. Supplement to The New World Atlas of Artificial Night Sky Brightness. Internet website:  
<https://doi.org/10.5880/GFZ.I.4.2016.001>.
- Hemmersmeir, S. 2021. “Washington County grew by more than 30% over past decade, per new U.S. Census release.” *The Spectrum*. August 12. Internet website:  
<https://www.thespectrum.com/story/news/2021/08/12/2020-us-census-utah-washington-county-st-george-iron-county/8116478002/>.
- Dark Sky International and Ogden Valley Starry Nights Chapter. 2016. Grand Staircase-Escalante National Monument Night Sky Quality Research Report. June. Ogden, Utah.

Mitchell, D., and T. Gallaway. 2019. "Dark Sky Tourism: Economic Impacts on the Colorado Plateau Economy, USA." *Tourism Review* 74(4):930–942.

#### *Natural Soundscapes*

BLM (United States Department of the Interior, Bureau of Land Management). 2020. Record of Decision and Approved Resource Management Plans for the Grand Staircase-Escalante National Monument. February. Internet website: [https://eplanning.blm.gov/public\\_projects/lup/94706/20012470/250017029/GSENM\\_ROD\\_and\\_ARMPs\\_February2020.pdf](https://eplanning.blm.gov/public_projects/lup/94706/20012470/250017029/GSENM_ROD_and_ARMPs_February2020.pdf).

\_\_\_\_\_. 2020. Record of Decision and Approved Resource Management Plan for the Kanab-Escalante Planning Area. February. Internet website: [https://eplanning.blm.gov/public\\_projects/lup/94706/20012472/250017031/KEPA\\_ROD\\_and\\_ARMP\\_Febryary2020.pdf](https://eplanning.blm.gov/public_projects/lup/94706/20012472/250017031/KEPA_ROD_and_ARMP_Febryary2020.pdf).

BLM GIS (United States Department of the Interior, Bureau of Land Management geographic information system). 2022. GIS data used in the GSENM alternatives, affected environment, and impact analysis. Kanab, Utah. Last edited April 19, 2024.

Duncan, E., K. Kaliski, and E. Wygonik. 2021. Three Considerations around Drone Noise and Strategies for Mitigation. RSG. Internet website: [https://rsginc.com/wp-content/uploads/2021/12/RSG\\_White-Paper\\_Drone-Noise\\_Updated-12-2021.pdf](https://rsginc.com/wp-content/uploads/2021/12/RSG_White-Paper_Drone-Noise_Updated-12-2021.pdf).

Mesquita GP, M. Mulero-Pázmány, S. A. Wich, J. D. Rodríguez-Teijeiro. 2022. Terrestrial Megafauna Response to Drone Noise Levels in Ex Situ Areas. *Drones* 6(11):333. Internet website: <https://doi.org/10.3390/drones6110333>.

NPS (National Park Service). 2021. Mapping Sound: Existing Conditions. Geospatial sounds modeling 2013–2015. Internet website: <https://www.nps.gov/subjects/sound/soundmap.htm>.

\_\_\_\_\_. 2022. Bryce Canyon National Park Final Air Tour Management Plan. Internet website: <https://parkplanning.nps.gov/showFile.cfm?projectID=103148&MIMEType=application%252Fpdf&filename=Bryce%20Canyon%5FFinal%20ATMP%5F10%2D18%2D22%2Epdf&sfid=611243>.

Southern Utah University. 2020. Baseline Acoustic Monitoring of Grand Staircase-Escalante National Monument: Final Project Report. Cedar City, Utah.

United States Department of Transportation. 2020. National Transportation Noise Map Project. Internet website: <https://www.bts.gov/geospatial/national-transportation-noise-map>.

#### *Fire and Fuels Management*

Baker, W. L., and D. J. Shinneman. 2004. "Fire and restoration of piñon-juniper woodlands in the western United States: A review." *Forest Ecology and Management* 189:1–21.

Barger, N. N., H. D. Adams, C. Woodhouse, J. C. Neff, and G. P. Asner. 2009. "Influence of livestock grazing and climate on pinyon pine (*Pinus edulis*) dynamics." *Rangeland Ecology and Management* 62:531–539.

- BLM (United States Department of the Interior, Bureau of Land Management). 2020. Programmatic EIS for Fuel Breaks in the Great Basin Record of Decision. Washington, DC.
- BLM GIS (United States Department of the Interior, Bureau of Land Management geographic information system). 2022. GIS data used in the GSENM alternatives, affected environment, and impact analysis. Kanab, Utah. Last edited [April 19, 2024](#).
- Bradley, A. F., N. V. Noste, and W. C. Fischer. 1992. Fire Ecology of Forests and Woodlands in Utah, General Technical Report INT-287. U.S. Department of Agriculture, Forest Service, Intermountain Research Station. Ogden, Utah.
- Bukowski, B. E., and W. L. Baker. 2013. "Historical fire regimes, reconstructed from land-survey data, led to complexity and fluctuation in sagebrush landscapes." *Ecological Applications* 23(3):546–564.
- D'Andrea, R. M. 2015. Paleoeecology of Grand Staircase-Escalante National Monument: Human Landscape Impacts and Management Implications on the Colorado Plateau. Master's Thesis. Northern Arizona University, Flagstaff.
- Evangelista, P., T. J. Stohlgren, D. Guenther, and S. Stewart. 2004. "Vegetation Response to Fire and Postburn Seeding Treatments in Juniper Woodlands of the Grand Staircase-Escalante National Monument, Utah." *Western North American Naturalist* 64(3):293–305.
- [Finney, M. A., T. B. Maynard, S. S. McAllister, and I. J. Grob. 2013. A Study of Ignition by Rifle Bullets. Res. Pap. RMRS-RP-104. US Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fort Collins, Colorado.](#)
- [Finney, M. A., C. T. Smith, and T. B. Maynard. 2019. Experiments on wildfire ignition by exploding targets. Res. Pap. RMRS-RP-108. United States Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fort Collins, Colorado.](#)
- Floyd, M. L., W. H. Romme, D. D. Hanna, M. Winterowd, D. Hanna, and J. Spence. 2008. "Fire History of Piñon-juniper Woodlands on Navajo Point, Glen Canyon National Recreation Area." *Natural Areas Journal* 28:26–36.
- Floyd, M. L., W. H. Romme, D. P. Hanna, and D. D. Hanna. In press. "Historical and Modern Fire Regimes in Piñon-Juniper Woodlands, Dinosaur National Monument, United States." *Rangeland Ecology and Management*. In press.
- Juran, C., B. A. Roundy, and J. N. Davis. 2008. Wildfire Rehabilitation Success With and Without Chaining on the Henry Mountains, Utah. In: Kitchen, S. G., R. L. Pendleton, T. A. Monaco, and J. Vernon, comps. 2008. Proceedings—Shrublands under fire: Disturbance and recovery in a changing world; 2006 June 6–8; Cedar City, Utah. Proc. RMRS-P-52. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. Fort Collins, Colorado.
- LANDFIRE. 2022. Vegetation Condition Class. Internet website: <https://landfire.gov/vcc.php>.

- Monsen, S. B., and S. G. Ketchum. 1994. Proceedings – Ecology and Management of Annual Rangelands. U.S. Department of Agriculture, Forest Service, Intermountain Research Station General Technical Report INT-GTR-313.
- National Wildfire Coordinating Group. 2022. Fire Regime Groups. Internet website: <https://www.nwccg.gov/term/glossary/fire-regime-groups>.
- Paysen, T. E., R. J. Ansley, J. K. Brown, G. J. Gottfried, S. M. Haase, M. G. Harrington, M. G. Narog, S. S. Sackett, and R. C. Wilson. 2000. Chapter 6: Fire in Western Shrubland, Woodland, and Grassland Ecosystems. In: James K. Brown and Jane Kapler Smith, eds., *Wildland Fire in Ecosystems: Effects of Fire on Flora*, General Technical Report RMRS-GTR-42-vol. 2. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. Ogden, Utah. Pp. 121–159.
- Romme, W. H., C. D. Allen, J. D. Bailey, W. L. Baker, B. T. Bestelmeyer, P. M. Brown, K. Eisenhart, M. L. Floyd, D. W. Huffman, B. F. Jacobs, R. F. Miller, E. H. Muldavin, T. W. Swetnam, R. J. Tausch, and P. J. Weisberg. 2009. “Historical and modern disturbance regimes, stand structures, and landscape dynamics in piñon–juniper vegetation of the Western United States.” *Rangeland Ecology and Management* 62:203–222.
- Romme, W.H., C. D. Allen, J. D. Bailey, W. L. Baker, B. T. Bestelmeyer, P. M. Brown, K. Eisenhart, M. L. Floyd-Hanna, D. W. Huffman, B. F. Jacobs, R. F. Miller, E. H. Muldavin, T. W. Swetnam, R. J. Tausch, and P. J. Weisberg. 2007. Historical and modern disturbance regimes of piñon–juniper vegetation in the western U.S. Nature Conservancy, Fire Learning Network. Tallahassee, Florida.
- USDA (United States Department of Agriculture). 2023. *Mature and Old-Growth Forests: Definition, Identification, and Initial Inventory on Lands Managed by the Forest Service and Bureau of Land Management (FS-1215a)*. Internet website: <https://www.fs.usda.gov/sites/default/files/mature-and-old-growth-forests-tech.pdf>
- Zouhar, K. 2003. *Bromus tectorum*. In: Fire Effects Information System. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. Internet website: <https://www.fs.usda.gov/database/feis/plants/graminoid/brotec/all.html>.
- Lands with Wilderness Characteristics*
- BLM (United States Department of the Interior, Bureau of Land Management). 1999. Utah Wilderness Inventory. Internet website: <https://www.blm.gov/sites/blm.gov/files/Utah%20Wilderness%20Inventory%201999.pdf>.
- \_\_\_\_\_. 2021a. Manual 6310—Conducting Wilderness Characteristics Inventory on BLM Lands. Release 6-138. BLM, Washington, DC. January 8.
- \_\_\_\_\_. 2021b. Manual 6320—Considering Lands with Wilderness Characteristics in the BLM Land Use Planning Process. Release 6-139. BLM, Washington, DC. January 8.



BLM GIS (United States Department of the Interior, Bureau of Land Management geographic information system). 2022. GIS data used in the GSENM alternatives, affected environment, and impact analysis. Kanab, Utah. Last edited April 19, 2024.

#### *Livestock Grazing*

BLM (United States Department of the Interior, Bureau of Land Management). 1979. Escalante Management Framework Plan. BLM, Escalante Resource Area, Cedar City District.

\_\_\_\_\_. 1979. Vermilion Management Framework Plan. BLM, Vermilion Resource Area, Cedar City District.

\_\_\_\_\_. 1999. Escalante Management Framework Plan Approved Amendment and Decision Record. BLM Utah State Office, Salt Lake City. March 15, 1999.

\_\_\_\_\_. 2001. BLM Handbook H-4180-1, Rangeland Health Standards. Washington, DC.

\_\_\_\_\_. 2006. Rangeland Health Determination. BLM, Grand Staircase-Escalante National Monument, Utah.

\_\_\_\_\_. 2020a. Record of Decision and Approved Resource Management Plans for the Grand Staircase-Escalante National Monument. February. Internet website: [https://eplanning.blm.gov/public\\_projects/lup/94706/20012470/250017029/GSENM\\_ROD\\_and\\_ARMPs\\_February2020.pdf](https://eplanning.blm.gov/public_projects/lup/94706/20012470/250017029/GSENM_ROD_and_ARMPs_February2020.pdf).

\_\_\_\_\_. 2020b. Record of Decision and Approved Resource Management Plan for the Kanab-Escalante Planning Area. February. Internet website: [https://eplanning.blm.gov/public\\_projects/lup/94706/20012472/250017031/KEPA\\_ROD\\_and\\_ARMP\\_February2020.pdf](https://eplanning.blm.gov/public_projects/lup/94706/20012472/250017031/KEPA_ROD_and_ARMP_February2020.pdf).

BLM GIS (United States Department of the Interior, Bureau of Land Management geographic information system). 2022. GIS data used in the GSENM alternatives, affected environment, and impact analysis. Kanab, Utah. Last edited April 19, 2024.

Wolf, K.M., R.A. Baldwin, and S. Barry. 2017. "Compatibility of livestock grazing and recreational use on coastal California public lands: importance, interactions, and management solutions." *Rangeland Ecology and Management* 70(2):192–201.

#### *Recreation and Visitor Services*

BLM (United States Department of the Interior, Bureau of Land Management). 1999. Escalante Management Framework Plan Approved Amendment and Decision Record. BLM Utah State Office, Salt Lake City. March 15, 1999.

\_\_\_\_\_. 2000. Grand Staircase-Escalante National Monument Management Plan. February. Internet website: [https://eplanning.blm.gov/public\\_projects/2020343/200528424/20069859/250076041/2000%20GSENM%20Monument%20Management%20Plan.pdf](https://eplanning.blm.gov/public_projects/2020343/200528424/20069859/250076041/2000%20GSENM%20Monument%20Management%20Plan.pdf).

- \_\_\_\_\_. 2022a. Recreation Management Information System (RMIS). GSENM Recreation Management Information System data.
- \_\_\_\_\_. 2022b. BLM Paria River District Special Recreation Permits. BLM Paria River District, Kanab, Utah.
- \_\_\_\_\_. 2022c. Little Desert Off-Highway Vehicle (OHV) Open Area. August 2022. Internet website: <https://www.blm.gov/utah-paria-river-do/public-room/data/little-desert-highway-vehicle-ohv-open-area>.
- \_\_\_\_\_. 2023. Recreation Management Information System (RMIS). GSENM Recreation Management Information System data.
- BLM GIS (United States Department of the Interior, Bureau of Land Management geographic information system). 2022. GIS data used in the GSENM alternatives, affected environment, and impact analysis. Kanab, Utah. Last edited [April 19, 2024](#).
- Marion, J. L., J. Wimpey, J. Arredondo, and F. Meadema. 2020. Sustainable Camping “Best Management Practices.” U.S. Department of the Interior, Geological Survey, Virginia Tech Field Unit. Final Research Report to the U.S. Department of the Interior, National Park Service, Appalachian Trail Park Office, and the Appalachian Trail Conservancy, Harpers Ferry, West Virginia.
- Monz, C. 2021. Outdoor Recreation and Ecological Disturbance: A Review of Research and Implications for Management of the Colorado Plateau Province. Utah State University, Recreation Ecology Lab. Southern Utah Wilderness Alliance.
- NPS (United States Department of the Interior, National Park Service). 2022. Stats Report Viewer. Internet website: [https://irma.nps.gov/STATS/SSRSReports/Park%20Specific%20Reports/Annual%20Park%20Recreation%20Visitation%20\(1904%20-%20Last%20Calendar%20Year\)?Park=ZION](https://irma.nps.gov/STATS/SSRSReports/Park%20Specific%20Reports/Annual%20Park%20Recreation%20Visitation%20(1904%20-%20Last%20Calendar%20Year)?Park=ZION).

#### *Travel Management*

- BLM (United States Department of the Interior, Bureau of Land Management). 2000. Grand Staircase-Escalante National Monument Management Plan. February. Internet website: [https://eplanning.blm.gov/public\\_projects/2020343/200528424/20069859/250076041/2000%20GSENM%20Monument%20Management%20Plan.pdf](https://eplanning.blm.gov/public_projects/2020343/200528424/20069859/250076041/2000%20GSENM%20Monument%20Management%20Plan.pdf).
- \_\_\_\_\_. 2020a. Record of Decision and Approved Resource Management Plans for the Grand Staircase-Escalante National Monument. February. Internet website: [https://eplanning.blm.gov/public\\_projects/lup/94706/20012470/250017029/GSENM\\_ROD\\_and\\_ARMPs\\_February2020.pdf](https://eplanning.blm.gov/public_projects/lup/94706/20012470/250017029/GSENM_ROD_and_ARMPs_February2020.pdf).
- \_\_\_\_\_. 2020b. Record of Decision and Approved Resource Management Plan for the Kanab-Escalante Planning Area. February. Internet website: [https://eplanning.blm.gov/public\\_projects/lup/94706/20012472/250017031/KEPA\\_ROD\\_and\\_ARMP\\_February2020.pdf](https://eplanning.blm.gov/public_projects/lup/94706/20012472/250017031/KEPA_ROD_and_ARMP_February2020.pdf).

BLM GIS (United States Department of the Interior, Bureau of Land Management geographic information system). 2022. GIS data used in the GSENM alternatives, affected environment, and impact analysis. Kanab, Utah. Last edited April 19, 2024.

#### *Lands and Realty*

BLM (United States Department of the Interior, Bureau of Land Management). 2000. Grand Staircase-Escalante National Monument Management Plan. February. Internet website: <https://eplanning.blm.gov/eplanning-ui/project/94706/570>.

\_\_\_\_\_. 2018. Analysis of the Management Situation – Grand Staircase-Escalante National Monument and Kanab-Escalante Planning Area. June. Internet website: <https://eplanning.blm.gov/eplanning-ui/project/94706/570>.

\_\_\_\_\_. 2020a. Record of Decision and Approved Resource Management Plan for the Kanab-Escalante Planning Area. February. Internet website: [https://eplanning.blm.gov/public\\_projects/lup/94706/20012472/250017031/KEPA\\_ROD\\_and\\_ARMP\\_Febryary2020.pdf](https://eplanning.blm.gov/public_projects/lup/94706/20012472/250017031/KEPA_ROD_and_ARMP_Febryary2020.pdf).

\_\_\_\_\_. 2020b. Record of Decision and Approved Resource Management Plans for the Grand Staircase-Escalante National Monument. February. Internet website: [https://eplanning.blm.gov/public\\_projects/lup/94706/20012470/250017029/GSENM\\_ROD\\_and\\_ARMPs\\_February2020.pdf](https://eplanning.blm.gov/public_projects/lup/94706/20012470/250017029/GSENM_ROD_and_ARMPs_February2020.pdf).

\_\_\_\_\_. 2022. BLM LR2000. “Case Information Report – Case Type Totals.” Department of the Interior Bureau of Land Management Case Recordation. Internet website: <https://reports.blm.gov/document/lr2000/204/Instructions>.

BLM GIS (United States Department of the Interior, Bureau of Land Management geographic information system). 2022. GIS data used in the GSENM alternatives, affected environment, and impact analysis. Kanab, Utah.

Trust Lands Administration. State of Utah School and Institutional Trust Lands (SITLA). 2023. Our Agency and Mission. Internet website: <https://trustlands.utah.gov/our-agency/>.

#### *Special Designations*

BLM (United States Department of the Interior, Bureau of Land Management). 1988. BLM Manual 1613—Areas of Critical Environmental Concern. Rel. I-1541, September 29, 1988. BLM, Washington, DC.

\_\_\_\_\_. 1991. Utah Statewide Wilderness Study Report. October. BLM, Salt Lake City, Utah.

\_\_\_\_\_. 1999. Utah Wilderness Inventory Report. February. BLM, Utah.

\_\_\_\_\_. 2000. Grand Staircase-Escalante National Monument Management Plan. February. Internet website: [https://eplanning.blm.gov/public\\_projects/2020343/200528424/20069859/250076041/2000%20GSENM%20Monument%20Management%20Plan.pdf](https://eplanning.blm.gov/public_projects/2020343/200528424/20069859/250076041/2000%20GSENM%20Monument%20Management%20Plan.pdf).

- 
- \_\_\_\_\_. 2012a. BLM Manual 6280—Management of National Scenic and Historic Trails and Trails Under Study or Recommended as Suitable for Congressional Designation. BLM, Washington, DC.
- \_\_\_\_\_. 2012b. Manual 6400—Wild and Scenic Rivers – Policy and Program Direction for Identification, Evaluation, Planning, and Management. Rel. 6-136. BLM, Washington, DC. July 13.
- \_\_\_\_\_. 2012c. Manual 6250—National Historic Trails Administration. BLM, Washington, DC.
- \_\_\_\_\_. 2012d. Manual 6330—Management of Wilderness Study Areas. Rel. 6-134. BLM, Washington, DC. July 13.
- \_\_\_\_\_. 2019. Grand Staircase-Escalante National Monument and Kanab-Escalante Planning Area Proposed Resource Management Plan and Final Environmental Impact Statement. Internet website: [https://eplanning.blm.gov/public\\_projects/lup/94706/20005730/250006733/03\\_GSENM-KEPA\\_modified\\_Proposed\\_RMPs-Final\\_EIS\\_Volume2.pdf](https://eplanning.blm.gov/public_projects/lup/94706/20005730/250006733/03_GSENM-KEPA_modified_Proposed_RMPs-Final_EIS_Volume2.pdf).
- \_\_\_\_\_. 2020a. Record of Decision and Approved Resource Management Plans for the Grand Staircase-Escalante National Monument. February. Internet website: [https://eplanning.blm.gov/public\\_projects/lup/94706/20012470/250017029/GSENM\\_ROD\\_and\\_ARMPs\\_February2020.pdf](https://eplanning.blm.gov/public_projects/lup/94706/20012470/250017029/GSENM_ROD_and_ARMPs_February2020.pdf).
- \_\_\_\_\_. 2020b. Record of Decision and Approved Resource Management Plan for the Kanab-Escalante Planning Area. February. Internet website: [https://eplanning.blm.gov/public\\_projects/lup/94706/20012472/250017031/KEPA\\_ROD\\_and\\_ARMP\\_Febryary2020.pdf](https://eplanning.blm.gov/public_projects/lup/94706/20012472/250017031/KEPA_ROD_and_ARMP_Febryary2020.pdf).
- \_\_\_\_\_. 2022. Grand Staircase-Escalante National Monument Analysis of the Management Situation. August. BLM, Kanab, Utah.
- BLM and NPS (United States Department of the Interior, Bureau of Land Management, and United States Department of the Interior, National Park Service). 2016. Comprehensive Administrative Strategy Old Spanish Historic National Trail.
- BLM GIS (United States Department of the Interior, Bureau of Land Management geographic information system). 2022. GIS data used in the GSENM alternatives, affected environment, and impact analysis. Kanab, Utah. Last edited [April 19, 2024](#).
- NPS (United States Department of the Interior, National Park Service). 2001. National Historic Trail Feasibility Study and Environmental Assessment: Old Spanish Trail. United States Department of the Interior.
- \_\_\_\_\_. 2018. The Old Spanish National Historic Trail Recreation and Development Strategy, Sevier, Piute, and Garfield Counties, Utah.

*Social and Economic Values*

- BLM (United States Department of the Interior, Bureau of Land Management). 2013. BLM Instruction Memorandum 2013-131—Guidance on Estimating Nonmarket Environmental Values, Ch. I. BLM, Washington Office, Washington, DC. Internet website: <https://www.blm.gov/policy/im-2013-131-ch1>.
- \_\_\_\_\_. 2020. Record of Decision and Approved Resource Management Plan for the Kanab-Escalante Planning Area. February. Internet website: [https://eplanning.blm.gov/public\\_projects/lup/94706/20012472/250017031/KEPA\\_ROD\\_and\\_ARMP\\_Febryary2020.pdf](https://eplanning.blm.gov/public_projects/lup/94706/20012472/250017031/KEPA_ROD_and_ARMP_Febryary2020.pdf).
- \_\_\_\_\_. 2021. Public Land Statistics. Washington, DC, reported by Headwaters Economics' BLM Socioeconomic Profile. Internet website: <https://headwaterseconomics.org/tools/blm-profiles/>.
- \_\_\_\_\_. 2022. Recreation Management Information System (RMIS). Unpublished data from internal database report. Washington, DC.
- Brown, G., K. de Bie, D. Weber. 2015. "Identifying public land stakeholder perspectives for implementing place-based land management." *Landscape and Urban Planning* 139:1–15. ISSN 0169-2046. Internet website: <https://doi.org/10.1016/j.landurbplan.2015.03.003>.
- Crompton, J. L., and S. Nicholls. 2020. "Impact on property values of distance to parks and open spaces: An update of U.S. studies in the new millennium." *Journal of Leisure Research* 51:2:127–146. Internet website: <https://doi.org/10.1080/00222216.2019.1637704>.
- IMPLAN (Impact Analysis for Planning Model). 2022. Margins and Deflators. Internet website: <https://support.implan.com/hc/en-us/articles/115009506007-Margins-Deflators>.
- \_\_\_\_\_. 2023. Data, using inputs provided by the user and IMPLAN Group LLC, IMPLAN System (data and software), Huntersville, North Carolina. Internet website: [www.IMPLAN.com](http://www.IMPLAN.com).
- Kem C. Gardner Policy Institute. 2022. Travel and Tourism County Profile. February 2022. University of Utah: David Eccles School of Business, Salt Lake City. Internet website: <https://gardner.utah.edu/wp-content/uploads/County-TT-Profiles-Mar2022.pdf?x71849>.
- Matz, M. 2017. Grand Staircase-Escalante a Recreational and Economic Boon. *Pew Charitable Trust*. June 7, 2017. Internet website: <https://www.pewtrusts.org/en/research-and-analysis/articles/2017/06/07/grand-staircase-escalante-a-recreational-and-economic-boon>.
- Office of Natural Resources Revenue. 2022. Total Revenue. Internet website: <https://revenue.data.doi.gov/>.
- Perlich, P. S., M. Hollingshaus, E. R. Harris, J. Tennert, and M. T. Hogue. 2017. Utah's Long-Term Demographic and Economic Projections Summary. Kem C. Gardner Policy Institute. University of Utah: David Eccles School of Business, Salt Lake City. Internet website: <https://gardner.utah.edu/wp-content/uploads/Projections-Brief-Final.pdf>.

- Rosenberger, R S. 2016. Recreation Use Values Database – Summary. Oregon State University, College of Forestry, Corvallis. Internet website: <https://recvaluation.forestry.oregonstate.edu/>.
- Rosenberger, R. S., E. M. White, J. D. Kline, and C. Cvitanovich. 2017. Recreation Economic Values for Estimating Outdoor Recreation Economic Benefits from the National Forest System. Gen. Tech. Rep. PNWGTR-957. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, Portland, Oregon.
- Sabata, D. 2018. “An analysis of culturally significant plants, springs, and archaeology at Grand Staircase-Escalante National Monument, Utah.” Master’s thesis, on file at Northern Arizona University, Flagstaff.
- Thomas, S. L., and S. E. Reed. 2019. “Entrenched ties between outdoor recreation and conservation pose challenges for sustainable land management.” *Environ. Res. Lett.* 14:115009. Internet website: <https://iopscience.iop.org/article/10.1088/1748-9326/ab4f52/pdf>.
- U.S. Department of Agriculture, Economic Research Service. 2022. Cow-calf production costs and returns, per cow in Basin and Range. Internet website: <https://www.ers.usda.gov/data-products/commodity-costs-and-returns/commodity-costs-and-returns/#Recent%20Cost%20and%20Returns>.
- U.S. Department of Commerce. 2021. Bureau of Economic Analysis, Regional Economic Accounts, Washington, DC, reported by Headwaters Economics’ Economic Profile System. Internet website: <https://headwaterseconomics.org/apps/economic-profile-system/>.
- \_\_\_\_\_. 2022. Census Bureau, American Community Survey Office, Washington, DC.
- U.S. Department of the Interior. 2022. Payment in Lieu of Taxes. Summary of State and Counties – UT. Internet website: [https://pilt.doi.gov/pdf\\_print\\_counties.cfm?fiscal\\_yr=2022&term=county&state\\_code=UT](https://pilt.doi.gov/pdf_print_counties.cfm?fiscal_yr=2022&term=county&state_code=UT).
- U.S. Department of Labor. 2021. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, Washington, DC, reported by Headwaters Economics’ Economic Profile System. Internet website: <https://headwaterseconomics.org/apps/economic-profile-system/>.
- Utah State Tax Commission. 2021. Annual Report. Internet website: <https://tax.utah.gov/commission/reports/fy21report.pdf>.
- White, E. M. 2017. Spending Patterns of Outdoor Recreation Visitors to National Forests. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, Portland Oregon. Internet website: [https://www.fs.fed.us/pnw/pubs/pnw\\_gtr961.pdf](https://www.fs.fed.us/pnw/pubs/pnw_gtr961.pdf).
- \_\_\_\_\_. 2022. Email communication with Eric White, United States Department of Agriculture, Forest Service, December 8, 2022.
- World Resources Institute. 2005. Millennium Ecosystem Assessment; Living beyond Our Means—Natural Assets and Human Well-being: Internet website: <https://www.millenniumassessment.org/documents/document.429.aspx.pdf>.

---

*Environmental Justice*

Arizona Commerce Authority. 2022. Population Projections and Industry Employment Projections by County. Internet website: <https://www.azcommerce.com/oeo/population/population-projections/>.

BLM (United States Department of the Interior, Bureau of Land Management). 2022. Addressing Environmental Justice in NEPA Documents: Frequently Asked Questions. U.S. Department of the Interior, Bureau of Land Management, Socioeconomics Program, Washington, DC.

CEQ (Council on Environmental Quality). 1997. Environmental Justice Guidance under the National Environmental Policy Act. Internet website: <https://www.epa.gov/environmentaljustice/ceq-environmental-justiceguidance-under-national-environmental-policy-act>.

Perlich, P. S., M. Hollingshaus, E. R. Harris, J. Tennert, and M. T. Hogue. 2017. Utah's Long-Term Demographic and Economic Projections Summary. Kem C. Gardner Policy Institute. University of Utah: David Eccles School of Business, Salt Lake City. Internet website: <https://gardner.utah.edu/wp-content/uploads/Projections-Brief-Final.pdf>.

Seebach, J., and J. Feinberg. 2021. Bears Ears and Grand Staircase-Escalante Need Protections Restored. Pew Charitable Trust. April 8, 2021. Internet website: <https://www.pewtrusts.org/en/research-and-analysis/articles/2021/04/08/bears-ears-and-grand-staircase-escalante-need-protections-restored>.

U.S. Department of Commerce. 2022. Census Bureau, 5-Year American Community Survey for 2010, 2015, 2020. Washington, DC.

**Chapter 4**

BLM (United States Department of the Interior, Bureau of Land Management). 2012. The National Programmatic Agreement among the BLM, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers. Internet website: <https://www.blm.gov/sites/blm.gov/files/National%20Programmatic%20Agreement.pdf>.

This page intentionally left blank.



# Glossary

**Acquisition:** The activity of obtaining land and/or interest in land through purchase, exchange, donation, or condemnation.

**Actual Use (grazing):** Where, how many, what kind or class of livestock, and how long livestock graze on an allotment, or on a portion or pasture of an allotment (from 43 Code of Federal Regulations [CFR] 4100.0-5).

**Adaptive Management:** Strategy that allows for future management actions, as applied through resource management guidelines, to fully incorporate the best available knowledge and experience gained from monitoring, evaluation, and experimentation over time. Involves four phases: planning, implementation, monitoring, and implementation monitoring.

**Air Pollution:** One or more chemicals or substances in high enough concentrations in the air to harm humans, other animals, vegetation, or materials. Such chemicals or physical conditions (such as excess heat or noise) are called air pollutants.

**Air Quality:** A measure of the health-related and visual characteristics of the air, often derived from quantitative measurements of the concentrations of specific injurious or contaminating substances.

**Air Quality Class I and II Areas:** Regions in attainment areas where maintenance of existing good air quality is of high priority. Class I areas are those that have the most stringent degree of protection from future degradation of air quality. Class II areas permit moderate deterioration of existing air quality.

**Air Quality Maintenance Area:** A geographic area that had a history of nonattainment but is now consistently meeting the National Ambient Air Quality Standards. Maintenance areas have been redesignated by the U.S. Environmental Protection Agency from “nonattainment” to “attainment with a maintenance plan,” or designated by the Environmental Quality Commission.

**Allocation:** Process to specifically assign use between and ration among competing users for a particular area of Bureau of Land Management (BLM)-managed land or related waters.

**Allotment:** An area of land designated and managed for grazing of livestock (43 CFR 4100.0-5).

**Allotment Management Plan:** A documented program developed as an activity plan, consistent with the definition at 43 United States Code 1702(k), that focuses on, and contains the necessary instructions for, the management of livestock grazing on specified BLM-managed lands to meet resource condition, sustained yield, multiple use, economic, and other objectives (from 43 CFR 4100.0-5).

**Alternative:** Other options to the proposed action by which the BLM can meet its purpose and need. The BLM is directed by the National Environmental Policy Act of 1969 to “study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources...” (National Environmental Policy Act Sec 102(2)E) (From National Environmental Policy Act Handbook H-1790-1).

**Ambient Air Quality:** The state of the atmosphere at ground level as defined by the range of measured or predicted ambient concentrations of all significant pollutants for all averaging periods of interest.

**Analysis Area:** Any lands, regardless of jurisdiction, that the BLM uses to analyze impacts on a particular resource.

**Analysis of the Management Situation (AMS):** Assessment of the current management direction. It includes a consolidation of existing data needed to analyze and resolve identified issues, a description of current BLM management guidance, and a discussion of existing problems and opportunities for solving them.

**Animal Unit Month (AUM):** The amount of forage necessary for the sustenance of one cow or its equivalent for a period of 1 month (from 43 CFR 4100.0-5).

**Aquatic:** Living or growing in or on the water.

**Aquifer:** Stratum or zone below the surface of the earth capable of producing water, as from a well. A saturated bed, formation, or group of formations that yield water in sufficient quantity to be of consequence as a source of supply. An aquifer acts as a transmission conduit and storage reservoir.

**Archaeological Site:** A location that contains material remains of past human activities, generally defined as over 50 years old.

**Archaeology:** The scientific study of the life and culture of past, especially ancient peoples, as by excavation of ancient cities, relics, artifacts, etc.

**Area of Critical Environmental Concern (ACEC):** Area within BLM-managed lands where special management attention is needed to protect important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards (from the Federal Land Policy and Management Act of 1976, Title 43 Chapter 35 Subchapter I 1702(a)).

**Artifact:** A human-modified object, often appearing on an archaeological site, that typically dates to over 50 years in age.

**Asset:** A nonbuilding facility and transportation construction, which include roads, primitive roads, and trails that are included in [Facility Asset Management System](#). The BLM maintains assets through the annual and deferred maintenance programs.

**Authorized Officer:** The federal employee who has the delegated authority to make a specific decision.

**Avoidance Area (Right-of-Way):** Areas with sensitive resource values where rights-of-way and Section 302 permits, leases, and easements would be strongly discouraged. Authorizations made in avoidance areas would have to be compatible with the purpose for which the area was designated and not be otherwise feasible on lands outside the avoidance area.

**Best Management Practice (BMP):** A technique that guides, or may be applied to, management actions to aid in achieving desired outcomes. BMPs are often developed in conjunction with land use plans, but they are not considered a land use plan decision unless the land use plan specifies that they are

mandatory. They may be updated or modified without a plan amendment if they are not mandatory (from H-1601-1, BLM Land Use Planning Handbook).

**Big Game:** Species of hooved protected wildlife as designated and managed by the Utah Division of Wildlife Resources.

**Biodiversity:** The variety of life and its processes, and the interrelationships within and among various levels of ecological organization.

**Biological Integrity:** The capacity to support and maintain a balanced, integrated, and adaptive biological system having the full range of elements (the form) and processes (the function) expected in a region's natural habitat.

**Biological Soil Crust:** Biological communities that form a surface layer or crust on some soils. These communities consist of cyanobacteria (blue-green bacteria), microfungi, mosses, lichens, and green algae and perform many important functions, including fixing nitrogen and carbon, maintaining soil surface stability, and preventing erosion. Biological soil crusts also influence the nutrient levels of soils and the status and germination of plants in the desert. These crusts are slow to recover after severe disturbance. See also *Cryptobiotic Crust*.

**Boundary:** (1) Every natural and/or artificial demarcation of the bounds or territorial extent of a federal interest asset; (2) limits or marks of enclosures if possession is not based on written title, or the boundaries or limits.

**Campground:** An area set aside and developed for camping with services and amenities like campsites, picnic tables, fire rings, trash collection, and toilets.

**Candidate Species:** Taxa for which the U.S. Fish and Wildlife Service has sufficient information on their status and threats to support proposing the species for listing as endangered or threatened under the Endangered Species Act but for which issuance of a proposed rule is currently precluded by higher-priority listing actions. Separate lists for plants, vertebrate animals, and invertebrate animals are published periodically in the Federal Register (from BLM Manual 6840, Special Status Species Manual).

**Canyoneering:** Canyoneering is the sport of exploring canyons using a range of techniques that include hiking, scrambling, sliding, stemming, chimneying, and rappelling.

**Carrying Capacity (grazing):** Refers to a measurement (actual or estimated) of how much forage a unit or piece of ground can produce on an average year. The carrying capacity is the maximum stocking rate possible that is consistent with maintaining or improving forage and other vegetation and related resources.

**Casual Collecting:** The collecting of a reasonable amount of common invertebrate and plant paleontological resources for noncommercial personal use, either by surface collection or the use of nonpowered hand tools resulting in only negligible disturbance to the earth's surface and other resources.

**Cenomanian-Santonian Ages:** Span of geologic ages including Cenomanian, Turonian, Coniacian, and Santonian during Late Cretaceous time, 98 to 84 million years ago.

**Class I Area (for air quality):** Certain wilderness areas greater than 5,000 acres, national memorial parks greater than 5,000 acres, national parks greater than 6,000 acres, and international parks that were in existence on or before August 7, 1977.

**Class II Area (for air quality):** By default, all areas not designated as Class I areas.

**Clean Air Act:** Federal legislation governing air pollution. The Clean Air Act established National Ambient Air Quality Standards for carbon monoxide, nitrogen dioxide, ozone, particulate matter, sulfur dioxide, and lead. Prevention of significant deterioration classifications define the allowable increased levels of air quality deterioration above legally established levels. They include the following:

- Class I: Minimal additional deterioration in air quality (certain national parks and wilderness areas)
- Class II: Moderate additional deterioration in air quality (most lands)
- Class III: Greater deterioration for planned maximum growth (industrial areas)

**Climate Change:** Any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer). Climate change may result from the following:

- Natural factors, such as changes in the sun's intensity or slow changes in the earth's orbit around the sun
- Natural processes within the climate system (for example, changes in ocean circulation)
- Human activities that change the atmosphere's composition (for example, driving motor vehicles) and the land surface (for example, deforestation, reforestation, urbanization, and desertification)

**Closed:** Generally, denotes that an area is not available for a particular use or uses; refer to specific definitions found in law, regulations, or policy guidance for application to individual programs. For example, 43 CFR 8340.0-5 sets forth the specific meaning of "closed" as it relates to off-highway vehicle use, and 43 CFR 8364 defines "closed" as it relates to closure and restriction orders (from H-1601-1, BLM Land Use Planning Handbook).

**Consultation:** The conduct of mutual, open, and direct two-way communication in good faith to secure meaningful and timely participation in the decision-making process, as allowed by law. See *Government-to-Government Consultation*, *Section 106 Consultation*, and *Section 7 Consultation* for the specific forms of consultation included in those processes.

**Criteria Air Pollutant:** Pollutants known to be hazardous to human health and the public welfare. The Clean Air Act required the U.S. Environmental Protection Agency to set National Ambient Air Quality Standards for pollutants known to be hazardous to human health and public welfare. Six pollutants were identified: ozone, carbon monoxide, particulate matter (defined as having diameters less than or equal to 10 microns or to 2.5 microns), sulfur dioxide, lead, and nitrogen oxides. The term "criteria pollutant" derives from the requirement that the U.S. Environmental Protection Agency must describe the characteristics and the potential health and welfare effects of these pollutants. It is on the basis of such criteria that the National Ambient Air Quality Standards are set or revised.

**Critical Habitat:** (1) The specific areas within the geographical area currently occupied by a species, at the time it is listed in accordance with the Endangered Species Act, on which are found those physical or

biological features (i) essential to the conservation of the species and (ii) that may require special management considerations or protection, and (2) specific areas outside the geographical area occupied by a species at the time it is listed upon determination by the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service that such areas are essential for the conservation of the species. Critical habitats are designated in 50 CFR Parts 17 and 226. The constituent elements of critical habitat are those physical and biological features of designated or proposed critical habitat essential to the conservation of the species (from BLM Manual 6840, Special Status Species Manual).

**Crucial Winter Range:** The portion of the winter range to which a wildlife species is confined during periods of heaviest snow cover.

**Cryptobiotic Crust:** See *Biological Soil Crust*.

**Cryptogam:** A plant that bears no flowers or seeds but propagates by means of spores. Cryptogamic organisms make up a cryptogamic crust or surface on certain soils.

**Cultural Resource or Cultural Property:** A definite location of human activity, occupation, or use identifiable through field inventory (survey), historical documentation, or oral evidence. The term includes archaeological, historic, or architectural sites, structures, or places with important public and scientific uses, and may include definite locations (sites or places) of traditional cultural or religious importance to specified social and/or cultural groups (see *Traditional Cultural Property [TCP]*). Cultural resources are concrete, material places and things that are located, classified, ranked, and managed through the system of identifying, protecting, and utilizing for public benefit described in the BLM Manual 8100 series. They may be but are not necessarily eligible for the National Register of Historic Places (see *Historic Property*).

**Cultural Resource Inventory Classes:** (See BLM Manual Section 8110.21.)

- Class I: Existing information inventory. A study of published and unpublished documents, records, files, registers, and other sources resulting in analysis and synthesis of all reasonably available data. Class I inventories encompass prehistoric, historic, and ethnological/sociological elements, and are in large part chronicles of past land uses. They may have major relevance to current land use decisions.
- Class II: Probabilistic field survey. A statistically based sample survey designed to help characterize the probable density, diversity, and distribution of archaeological properties in a large area by interpreting the results of surveying limited and discontinuous portions of the target area (cf. “reconnaissance survey”).
- Class III: Intensive field survey. A continuous, intensive survey of an entire target area, aimed at locating and recording all archaeological properties that have surface indications, by walking close-interval parallel transects until the area has been thoroughly examined. Class III methods vary geographically, conforming to the prevailing standards for the region involved (from BLM Manual 8100, BLM Cultural Resources Management).

**Cumulative Effect:** The impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative effects can result

from individually minor but collectively significant actions taking place over a period of time (from H-1790-I, BLM National Environmental Policy Act Handbook).

**Decision Area:** The lands within the [planning area](#) for which the BLM has authority to make management decisions.

**Departed Watershed:** [Hydrologic Unit Code \(HUC\)-10 or HUC-12](#) watersheds with a high degree of departure from reference conditions identified by the BLM Utah State Office relating to water, soil, and vegetation resources. For more information about the analysis, see **Appendix B of this Proposed Final RMP/EIS**.

**Designated Camping Areas:** [Camping areas on public lands away from developed recreation facilities in distinct and defined campsites that are usually marked with signage. Typically, no services or amenities are provided.](#)

**Designated Roads and Trails:** Specific roads and trails identified by the BLM (or other agencies) where some type of motorized vehicle use is appropriate and allowed either seasonally or year-long (from H-1601-I, BLM Land Use Planning Handbook).

**Discretionary Use/Action:** [A use for which the BLM retains the discretion to authorize or decline to authorize.](#)

**Dispersed Camping:** [Camping on public lands away from developed recreation facilities. Typically, no services or amenities are provided. General rules apply, such as the distance from waterbodies and the proximity to a road.](#)

**Dispersed or Extensive Recreation:** [Recreational activities of an unstructured type that are not confined to specific locations or dependent on recreation sites. Examples of these activities may be hunting, fishing, off-highway vehicle use, hiking, and sightseeing.](#)

**Disposal:** Transfer of BLM-managed land out of federal ownership to another party through sale, exchange, Recreation and Public Purposes Act, Desert Land Entry, or other land law statutes.

**Distance Zones:** A subdivision of the landscape as viewed from an observer position. The subdivision (zones) includes foreground-middle ground, background, and seldom seen.

**Ecological Resilience:** [The amount of disturbance that an ecosystem can withstand without changing self-organized processes and structures \(defined as alternative stable states\).](#)

**Ecological Site Group (ESG):** Generalized groupings of U.S. Department of Agriculture, Natural Resources Conservation Service ecological sites based on climate, soil, and geomorphic properties.<sup>1</sup> Ecological site groups incorporate additional context and information about how landscapes may respond to management.

---

<sup>1</sup> Nauman, T. W., S. S. Burch, J. T. Humphries, A. C. Knight, and M. C. Duniway. 2022. "A Quantitative Soil-Geomorphic Framework for Developing and Mapping Ecological Site Groups." *Rangeland Ecology and Management* 81:9–33.

**Ecological Site Inventory:** The basic inventory of present and potential vegetation on BLM rangelands. Ecological sites are differentiated based on significant differences in kind, proportion, or amount of plant species in the plant community. Ecological site inventory uses soils, the existing plant community, and ecological site data to determine the appropriate ecological site for a specific area of rangeland and to assign the appropriate ecological status.

**Ecosystem:** A system made up of a community of animals, plants, and bacteria and its interrelated physical and chemical environment.

**Eligible River Segment:** A section of a river that qualifies for inclusion into the National Wild and Scenic Rivers System through determination that it is free-flowing and with its adjacent land area possessing at least one river-related value considered to be outstandingly remarkable.

**Emergency Stabilization and Rehabilitation:** Actions to stabilize and prevent unacceptable degradation to land or resources, to minimize threats to life or property resulting from the effects of a fire, or to repair/replace/construct physical improvements necessary to prevent degradation of land or resources.

**Endangered Species:** Any animal or plant species in danger of extinction throughout all or a significant portion of its range. These species are listed by the U.S. Fish and Wildlife Service (from BLM Manual 6840, Special Status Species Manual).

**Environment:** An area that meets a specific set of physical, biological, temporal, or spatial characteristics that satisfy the requirements of a plant or animal species or group of species for part or all of their life cycle.

**Ephemeral Stream:** A stream that flows only in direct response to precipitation, and whose channel is always above the water table. Ephemeral streams generally do not flow continuously for more than 30 days and generally have more robust upland vegetation than found outside of the ephemeral riparian-wetland area.<sup>2</sup>

**Exclusion Area (for Rights-of-Way):** Areas which are not available for location of rights-of-way under any condition (from H-1601-1, BLM Land Use Planning Handbook).

**Extensive Recreation Management Area (ERMA):** An administrative unit that requires specific management consideration in order to address recreation use, demand, or recreation and visitor services program investments.

---

<sup>2</sup> United States Department of the Interior. 1998. Riparian Area Management: A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas. Technical Reference 1737-15. Bureau of Land Management, Forest Service, Natural Resources Conservation Service. Written by: Prichard, D., J. Anderson, C. Correll, J. Fogg, K. Gebhardt, R. Krapf, S. Leonard, B. Mitchell, and J. Staats. Denver: CO. BLM/RS/ST-98/001+1737. 127 pp.

**Facies:** A lateral or vertical variation in the lithologic or [paleontological](#) characteristics of a geologic formation that differs as a group from that elsewhere in the same formation. It is caused by or reflects a change in the depositional environments.<sup>3</sup>

**Facilities:** [All or any portion of a building, structure, site improvement, element, pedestrian route, or vehicular way located on a site. An element is an architectural or mechanical component, generally including toilets, picnic tables, grills, registration kiosks, etc., at a site \(including a staging site\).](#)

**Fauna:** The animals of a specified region or time.

**Federal Land Policy and Management Act of 1976 (FLPMA):** Public Law 94-579 (October 21, 1976), often referred to as the BLM's "Organic Act," which provides the majority of the BLM's legislated authority, direction, policy, and basic management guidance.

**Fire Management Plan (FMP):** A strategic implementation-level plan that defines a program to manage wildland fire, fuel reduction, and fire rehabilitation based on an area's approved Resource Management Plan. FMPs must address a full range of fire management activities that support ecosystem sustainability, values to be protected, protection of firefighter and public safety, public health, and environmental issues. They must be consistent with resource management objectives and activities of the area.

**Fire Regime Group:** A classification of fire regimes into a discrete number of categories based on frequency and severity. The national, coarse-scale classification of fire regime groups commonly used includes five groups: I - frequent (0–35 years), low severity; II - frequent (0–35 years), stand replacement severity; III - 35–100+ years, mixed severity; IV - 35–100+ years, stand replacement severity; and V - 200+ years, stand replacement severity.

**Floodplain:** A plain along a river, formed from sediment deposited by floods.

**Flora:** The plants of a specified region or time.

**Forage:** Vegetation of all forms available and of a type used for animal consumption.

**Forage Reserve Allotment:** [A designation for a type of allotment on which there is no current term permit obligation for some portion of or all the estimated livestock grazing capacity, and where there has been a project-level environmental analysis and decision made to infrequently use the available forage on the allotment to enhance management flexibility for authorized livestock use or to achieve a desired vegetation condition.](#)

**Fossil:** Any remains, traces, or imprints of prehistoric nonhuman organisms preserved in or on the [earth's](#) crust that provide information about the history of life on [earth](#).

**Fugitive Dust:** [Airborne particles emitted from any source other than through a stack or vent.](#)

---

<sup>3</sup> Stokes, W. L. 1986. *Geology of Utah*. Utah Museum of Natural History, University of Utah and Utah Geological and Mineral Survey, Department of Natural Resources, State of Utah. Salt Lake City, Utah; Skinner, B. J., and S. C. Porter. 1992. *The Dynamic Earth: An Introduction to Physical Geology*. John Wiley and Sons, Inc. New York: New York.



**Functioning At Risk (FAR):** (1) Condition in which vegetation and soil are susceptible to losing their ability to sustain naturally functioning biotic communities. Human activities, past or present, may increase the risks. (2) Uplands or riparian-wetland areas that are properly functioning, but a soil, water, or vegetation attribute makes them susceptible to degradation and lessens their ability to sustain natural biotic communities. Uplands are particularly at risk if their soils are susceptible to degradation. Human activities, past or present, may increase the risks. See also *Properly Functioning Condition* (from [Handbook H-4180-I](#), BLM Rangeland Health Standards Manual).

**Geographic Information System (GIS):** A system of computer hardware, software, data, people, and applications that capture, store, edit, analyze, and graphically display a potentially wide array of geospatial information (from H-1601-I, BLM Land Use Planning Handbook).

**Geology:** The science that studies the earth, the rocks of which it is composed, and the changes it has undergone or is undergoing.

**Goal:** A broad statement of a desired outcome; usually not quantifiable and may not have established times for achievement (from H-1601-I, BLM Land Use Planning Handbook).

**Government-to-Government Consultation:** The consultation between BLM officials with decision-making authority and elected tribal officials or those tribal representatives specifically delegated by elected tribal officials to engage in such consultation and decision-making. It is built on the government-to-government exchange of information and aims to create effective collaboration and informed decision-making. Consultation is an accountable process that ensures meaningful and timely input by tribal officials into the development of regulatory policies and agency decisions that have tribal implications (from BLM Manual MS-1780 Tribal Relations).

**Grazing Allotment Categories:** Direction under which all grazing allotments are categorized for management purposes into three groups. The overall objectives are M, maintain the current resource conditions; I, improve the current resource conditions; and C, custodial manage the existing resource values.

**Grazing Permit:** A document authorizing use of the BLM-managed lands within an established grazing district. Grazing permits specify all authorized use including livestock grazing and suspended use. Permits specify the total number of animal unit months apportioned, the area authorized for grazing use, or both (from 43 CFR 4100.0-5).

**Grazing Preference or Preference:** A superior or priority position against others for the purpose of receiving a grazing permit or lease. This priority is attached to base property owned or controlled by the permittee or lessee (from 43 CFR 4100.0-5).

**Greenhouse Gas (GHG):** A gas in an atmosphere that absorbs and emits radiation within the thermal infrared range. This process is the fundamental cause of the greenhouse effect. The primary GHGs in the earth's atmosphere are water vapor, carbon dioxide, methane, nitrous oxide, and ozone.

**Guideline:** A practice, method, or technique determined to be appropriate to ensure that standards can be met or that significant progress can be made toward meeting the standard. Guidelines are tools such as grazing systems, vegetative treatments, or improvement projects that help managers and permittees

achieve standards. Guidelines may be adapted or modified when monitoring or other information indicates the guideline is not effective, or a better means of achieving the applicable standard becomes appropriate (from H-4180-I, BLM Rangeland Health Standards Manual).

**Habitat Management Plan (HMP):** An officially approved activity plan for a specific geographic area of BLM-managed land. An HMP identifies wildlife habitat and related objectives, defines the sequence of actions to be implemented to achieve the objectives, and outlines procedures for evaluating accomplishments.

**Hanging Garden:** Small pockets of vegetative associations surrounding canyon-wall springs that often contain a wide variety of unique plant and insect species. Hanging gardens are characteristic of flat-lying strata with deeply incised canyons of the Colorado Plateau.

**Hazardous Air Pollutant:** Pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects.

**Historic Property:** Cultural resources, such as historic buildings, structures, objects, districts, or archaeological sites, that are listed on, or eligible for listing on, the National Register of Historic Places.

**Hydrological Function:** [The capacity of an area to capture, store, and safely release water from rainfall, run-on, and snowmelt \(where relevant\); to resist a reduction in this capacity; and to recover this capacity when a reduction does occur.](#)

**Hydrology:** [The science dealing with the properties, distribution, and circulation of water.](#)

**Impacts (or Effects):** Changes to the human environment from the proposed action that are reasonably foreseeable. Effects analysis predicts the degree to which the environment would be affected by an action. The Council on Environmental Quality uses both the terms “effect” and “impact” in the National Environmental Policy Act regulations; these terms are synonymous in the National Environmental Policy Act context. As a noun, other synonyms include consequence, result, and outcome. Effects can be both beneficial and detrimental.

**Implementation Decisions:** Decisions that take action to implement land use plan decisions; generally appealable to the Interior Board of Land Appeals under 43 CFR 4.410 (from H-1601-I, BLM Land Use Planning Handbook).

**Implementation Plan:** A sub-geographic or site-specific plan written to implement decisions made in a land use plan. Implementation plans include both activity plans and project plans (they are types of implementation plans) (from H-1601-I, BLM Land Use Planning Handbook).

**Indian Tribe (or Tribe):** Any Indian or Alaska Native tribe, band, nation, pueblo, village, or community that the Secretary of the Interior acknowledges to exist as an Indian tribe pursuant to the Federally Recognized Indian Tribe List Act of 1994 (from BLM Handbook H-1780-I, part G2).

**Indirect Economic Impacts:** Impacts in the industries that supply or interact with the primary industries. For example, when a restaurant expands and purchases new materials, the industry sectors supplying the materials experience indirect impacts.

**Induced Economic Impacts:** Impacts that represent increased spending by workers who earn money due to increased economic activity, such as when restaurant employees use their wages to purchase goods from local shops.

**Inholding:** A nonfederal parcel of land within the designated area boundary perimeter line that would become part of the designated area should it be acquired.

**Instant Study Area (ISA):** [One of the 55 primitive and natural areas formally identified by the BLM through a final action published in the Federal Register before November 1, 1975. The Federal Land Policy and Management Act of 1976 required an accelerated wilderness review of these Wilderness Study Areas.](#)

**Intermittent or Seasonal Stream:** A stream that flows only at certain times of the year when it receives water from springs or from some surface source such as melting snow in mountainous areas. Generally, intermittent streams flow continuously for periods of at least 30 days and usually have visible vegetation or physical characteristics reflective of permanent water influences, such as the presence of cottonwoods.<sup>4</sup>

**Invasive Plant:** Plants that are not native and cause or are likely to cause harm to ecology, the economy, or human health (Executive Orders 13112 and 13751).

**Invertebrate Species:** Any animal without a backbone or spinal column.

**Kind or Class of Livestock:**

- **Kind:** The species of domestic livestock-cattle and sheep
- **Class:** The age class (that is, yearling or cows) of a species of livestock

**Known Geologic Structures:** Technically, the known geologic structure of a producing oil or gas field is construed by the U.S. Geological Survey to be the trap, whether structural or stratigraphic, in which an accumulation of oil or gas has taken place, and the limits of said trap, irrespective of the degree to which it may be occupied by oil or gas. Known geologic structures are frequently much more extensive than the pools of oil or gas they may contain, and the extent and place of any oil or gas accumulation therein, though influenced by structure, is finally determined by such factors as stratigraphy, hydrocarbon supply, sand conditions, and hydrostatic pressure. The U.S. Geological Survey seeks to evaluate the net effect of these several factors in terms of reasonably presumptive productive acreage and, as far as practicable, to conform the results, modified to include a fair safety margin, to the subsurface contours of the dominant structural feature involved.

**L50 (dba):** A descriptor of loudness, which represents the existing ambient noise levels where the sound level is exceeded 50 percent of the time.

---

<sup>4</sup> United States Department of the Interior. 1998. Riparian Area Management: A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas. Technical Reference 1737-15. Bureau of Land Management, Forest Service, Natural Resources Conservation Service. Written by: Prichard, D., J. Anderson, C. Correll, J. Fogg, K. Gebhardt, R. Krapf, S. Leonard, B. Mitchell, and J. Staats. Denver: CO. BLM/RS/ST-98/001+1737. 127 pp.

**L90 (dba):** A descriptor of loudness, which represents the existing ambient noise levels where the sound level is exceeded 90 percent of the time.

**Land Tenure Adjustments:** Ownership or jurisdictional changes are referred to as “Land Tenure Adjustments.” To improve the manageability of BLM-managed surface land and improve their usefulness to the public, the BLM has numerous authorities for “repositioning” lands into a more consolidated pattern, disposing of lands, acquiring lands, and entering into cooperative management agreements. These land pattern improvements are completed primarily by using land exchanges, but also through land sales, land acquisitions, jurisdictional transfers to other agencies, and use of cooperative management agreements and leases.

**Land Use Allocation:** The identification in a land use plan of the activities and foreseeable development that are allowed, restricted, or excluded for all or part of the decision area, based on desired future conditions (from H-1601-I, BLM Land Use Planning Handbook).

**Land Use Plan (LUP):** A set of decisions that establish management direction for land within an administrative area, as prescribed under the planning provisions of the Federal Land Policy and Management Act; an assimilation of LUP-level decisions developed through the planning process outlined in 43 CFR 1600, regardless of the scale at which the decisions were developed. The term includes both Resource Management Plans and Management Framework Plans (from H-1601-I, BLM Land Use Planning Handbook).

**Land Use Plan Amendment:** The process for considering or making changes in the terms, conditions, and decisions of approved Resource Management Plans or Management Framework Plans. Usually only one or two issues are considered that involve only a portion of the decision area (from H-1601-I, BLM Land Use Planning Handbook).

**Land Use Plan Decision:** Establishes desired outcomes and actions needed to achieve them. Decisions are reached using the planning process in 43 CFR 1600. When they are presented to the public as proposed decisions, they can be protested to the BLM Director. They are not appealable to the Interior Board of Land Appeals (from H-1601-I, BLM Land Use Planning Handbook).

**LANDFIRE:** Program that provides over 25 national geospatial layers (such as vegetation, fuel, and disturbance), databases, and ecological models.

**Lands Records System:** Those records maintained by the BLM, showing rights, title, and interest of the federal land.

**Lease:** An authorization or contract by which one party conveys the use of property to another party in return for rental payments. Section 302 of the Federal Land Policy and Management Act of 1976 provides the BLM’s authority to issue leases for the use, occupancy, and development of public lands. Leases are issued for purposes such as communication sites, parks, and other recreational facilities. The regulations establishing procedures for the processing of these leases are found in 43 CFR 2920 and 2740.

**Lek:** An assembly area where birds, especially sage-grouse, carry on display and courtship behavior.

**Light Pollution:** The brightening of the night sky caused by streetlights and other human-made sources.

---

**Living Systems (wholesome):** Open, self-organizing systems that have the special characteristics of life and that interact with their environment.

**Management Decision:** A decision made by the BLM to manage BLM-managed lands. Management decisions include both land use plan decisions and implementation decisions (from H-1601-1, BLM Land Use Planning Handbook).

**Management-Ignited Fire:** Controlled application of fire to natural fuels under conditions of weather, fuel moisture, and soil moisture that will allow confinement of the fire to a predetermined area and, at the same time, will produce the intensity of heat and rate of spread required to accomplish certain planned benefits to one or more objectives to wildlife, livestock, and watershed values. The overall objectives are to employ fire scientifically to realize maximum net benefits at minimum environmental damage and acceptable cost.

**Management of Land Boundary Plans:** A high-level boundary evidence risk assessment for a special management area, generally focused on high-risk boundaries of high-valued lands or resources; used in outyear Management of Land Boundary budget and workforce planning documents.

**Mature and Old Growth:** Vegetation and forests that are generally defined by the vegetation structure, composition, function, and ecological processes. Mature forests are the entire stage of stand development from understory reinitiation to onset of old growth. GSENM management is consistent with federal mandates and BLM policies; it uses the best available science to identify and define specific mature and old-growth vegetation communities. As of 2024, the BLM uses existing old-growth definitions maintained by each Forest Service region in the Forest Inventory and Analysis Program. (See *Mature and Old-Growth Forests: Definition, Identification, and Initial Inventory on Lands Managed by the Forest Service and Bureau of Land Management - Fulfillment of Executive Order 14072, Section 2(b), 2022.*)

**Mechanical Transport (mechanized vehicle):** Any vehicle, device, or contrivance for moving people or material in or over land, water, snow, ice, or air that has moving parts as essential components of the transport and that has wheels or otherwise applies a mechanical advantage, regardless of power source. Mechanical transport includes, but is not limited to bicycles, game carts, wagons, and wheelbarrows. It does not include devices that may provide mechanical advantage but are not used for transporting material over great distances (such as pulleys, pry bars, or winches), or methods of transport where the mechanical advantage is from nonmoving parts (such as travois) or is incidental to primary means of transport (such as ski bindings, horse bits, or oarlocks). Wheelchairs, or other mobility devices that meet the definition of “wheelchair” in the Americans with Disabilities Act, Section 508(c), are not prohibited in Wilderness Study Areas.

**Methane:** Emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock, other agricultural practices, and land use and by the decay of organic waste in municipal solid waste landfills.

**Migratory:** A group of people or of birds, fishes, or plants that move from one region to another with the change of seasons or climate.

**Minimum Impact Filming:** A filming activity that does not involve:

- Impact on sensitive habitat or species
- Impact on Native American Indian sacred rites
- Use of explosives or major use of pyrotechnics
- More than minimum impacts on land, air, or water
- Use of exotic species with danger of introduction into the area
- Adverse impacts on sensitive resources including historic, cultural, or paleontological sites; sensitive soils; relict environments; or wetlands or riparian areas
- Use of heavy equipment
- Use of vehicles off designated routes
- Set construction
- Significant restriction of public access
- Significant use of domestic livestock
- Aircraft taking off, landing, or flying lower than 1,000 feet above the site
- 15 or more production vehicles, or 75 or more people
- [More than](#) 10 days of production

**Mitigation:** A method or process by which impacts from actions may be made less injurious to the environment through appropriate protective measures. 40 CFR 1508.20 further defines mitigation as: (1) avoiding the impact altogether by not taking a certain action or parts of an action; (2) minimizing an impact by limiting the degree or magnitude of the action and its implementation; (3) rectifying the impact by repairing, rehabilitating, or restoring the affected environment; (4) reducing or eliminating the impact over time by preservation and maintenance; and/or (5) compensating for the impact by replacing or providing substitute resources or environments.

**Mitigation Measures:** Constraints, requirements, or conditions imposed to reduce the significance of or eliminate an anticipated impact on environmental, socioeconomic, or other resource values from a proposed land use. Committed mitigation measures are those measures the BLM is committed to enforce (that is, all applicable laws and their implementing regulations).

**Monument Management Plan (MMP):** A land use plan as prescribed by the Federal Land Policy and Management Act and National Forest Management Act that establishes land use allocations, coordination guidelines for multiple use, objectives, and actions to be achieved for a national monument and given area of land.

**Multiple Use:** The management of BLM-managed lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to changing needs and conditions; the use of some land for less than all of the resources; a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific, and historical values; and harmonious and coordinated

management of the various resources without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output (from the Federal Land Policy and Management Act, Title 43 Chapter 35 Subchapter I 1702(c)).

**National Ambient Air Quality Standards (NAAQS):** The allowable concentrations of air pollutants in the air specified by the federal government. The air quality standards are divided into primary standards (based on the air quality criteria and allowing an adequate margin of safety to protect the public health) and secondary standards (based on the air quality criteria and allowing an adequate margin of safety to protect the public welfare) from any unknown or expected adverse effects of air pollutants.

**National Register of Historic Places (NRHP):** The NRHP, expanded and maintained by the Secretary of the Interior, as authorized by section 2(b) of the Historic Sites Act and section 101(a)(1)(A) of the National Historic Preservation Act. The NRHP lists cultural properties found to qualify for inclusion because of their local, state, or national significance. Eligibility criteria and nomination procedures are found in 36 CFR Part 60. The Secretary's administrative responsibility for the NRHP is delegated to the National Park Service (from Manual 8100, BLM Cultural Resources Management).

**National Wild and Scenic Rivers System:** A system of nationally designated rivers and their immediate environments that have outstanding scenic, recreational, geologic, fish and wildlife, historic, cultural, and other similar values and are preserved in a free-flowing condition. The system consists of three types of streams: (1) recreation—rivers or sections of rivers that are readily accessible by road or railroad and that may have some development along their shorelines and may have undergone some impoundments or diversion in the past; (2) scenic—rivers or sections of rivers free of impoundments with shorelines or watersheds still largely undeveloped but accessible in places by roads; and (3) wild—rivers or sections of rivers free of impoundments and generally inaccessible except by trails, with watersheds or shorelines essentially primitive and waters unpolluted.

**Natural Plant Community:** A plant community that by and large lacks invasive species.

**Natural Processes:** Interactions among plants, animals, and the environment. These interactions include photosynthesis, pollination, decomposition, and others that help create and shape natural communities.

**Naturalized Species:** Nonnative species that integrates into a given ecosystem and becomes capable of reproducing.

**Naturalness:** An area that generally appears to have been affected primarily by the forces of nature, with the imprints of man's work substantially unnoticeable.

**Net Loss:** When the total amount of losses exceeds the total amount of gains.

**Nitrogen Oxides:** Produced from burning fuels, including gasoline and coal. Nitrogen oxides are smog formers, which react with volatile organic compounds to form smog. Nitrogen oxides are also major components of acid rain.

**Nitrous Oxide:** Emitted during agricultural, land use, and industrial activities; combustion of fossil fuels and solid waste; and wastewater treatment.

**Nonattainment Area:** An area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) any of the federal primary or secondary ambient air quality standards for the pollutant.

**Nonfunctioning:** Riparian-wetland areas that clearly are not providing adequate vegetation, landform, or large woody debris to dissipate stream energy associated with high flows.

**Nonmarket benefit:** Improvements in societal welfare that are not bought or sold.

**Nonmechanized Travel:** Moving by foot or by pack or stock animal.

**Nonnative Plant:** An introduced plant species living outside its native distributional range that has arrived there by human activity, either deliberate or accidental.

**Noxious Weed:** Designated under federal and state noxious weed acts. Noxious weeds in the planning area are listed under the Utah Noxious Weed Act of 2008. This act defines “noxious weed” as “any plant the commissioner determines to be especially injurious to public health, crops, livestock, land, or other property.”

**Objective:** A description of a desired condition for a resource. Objectives can be quantified and measured and, where possible, have established time frames for achievement (from H-1601-1, BLM Land Use Planning Handbook).

**Off-Highway Vehicle (OHV):** Any motorized vehicle capable of, or designed for, travel on or immediately over land, water, or other natural terrain, excluding: (1) any non-amphibious registered motorboat; (2) any military, fire, emergency, or law enforcement vehicle while being used for emergency purposes; (3) any vehicle whose use is expressly authorized by the BLM Authorized Officer, or otherwise officially approved; (4) vehicles in official use; and (5) any combat or combat support vehicle when used for national defense (from H-1601-1, BLM Land Use Planning Handbook).

**Off-Highway Vehicle Designations:**

- Open: designated areas where OHVs may be operated.
- Limited: designated areas and trails where the use of an OHV is subject to restrictions, such as limiting the dates and times of use (seasonal restrictions); limiting use to designated roads and trails; or limiting use to existing roads and trails. Combinations of restrictions are possible.
- Closed: designated areas, roads, and trails where the use of an OHV is permanently or temporarily prohibited. Emergency use of vehicles is allowed.

**Official Use:** Use by an employee, agent, or designated representative of the federal government or one of its contractors, in the course of his employment, agency, or representation (from BLM National Management Strategy for OHV Use on Public Lands).

**Old Growth:** See *Mature and Old Growth*.

**Open:** Generally, denotes that an area is available for a particular use or uses. Refer to specific program definitions found in law, regulations, or policy guidance for application to individual programs. For example,



---

43 CFR 8340.0-5 defines the specific meaning of “open” as it relates to off-highway vehicle use (from H-1601-I, BLM Land Use Planning Handbook).

**Outstanding Natural Area (ONA):** A 1994 *Federal Register* notice (59 FR 107, 29205-29206) clarified that the regulations under which these areas were classified are no longer relevant. These were established to preserve scenic values and areas of natural wonder. The preservation of these resources in their natural condition was the primary management objective. Access roads, parking areas, and public use facilities were normally located on the periphery of the area. The public was encouraged to walk into the area for recreational purposes wherever feasible.

**Outstandingly Remarkable Values:** Values among those listed in Section I (b) of the Wild and Scenic Rivers Act: “scenic, recreational, geological, fish and wildlife, historical, cultural, or other similar values.” Other similar values that may be considered include ecological, biological or botanical, paleontological, hydrological, scientific, or research values (from BLM Manual 8351, BLM Wild and Scenic Rivers Policy and Program).

**Ozone:** A gas that is a variety of oxygen. The oxygen gas found in the air consists of two oxygen atoms stuck together; this is molecular oxygen. Ozone consists of three oxygen atoms stuck together into an ozone molecule. Ozone occurs in nature; it produces the sharp smell near a lightning strike. High concentrations of ozone gas are found in a layer of the atmosphere—the stratosphere—high above the earth. Stratospheric ozone shields the earth against harmful rays from the sun, particularly ultraviolet B. Smog’s main component is ozone; this ground-level ozone is a product of reactions among chemicals produced by burning coal, gasoline, and other fuels, and chemicals found in products, including solvents, paints, and hairsprays.

**Paleontological Resource:** Any fossilized remains, traces, or imprints of organisms, preserved in or on the earth’s crust, that are of paleontological interest and that provide information about the history of life on earth.

**Paleontology:** The scientific study of prehistoric life based on fossil record.

**Particulate Matter:** Includes dust, soot, and other tiny bits of solid materials that are released into and move around in the air. Particulates are produced by many sources, including burning of diesel fuels by trucks and buses; incineration of garbage; mixing and application of fertilizers and pesticides; road construction; industrial processes, such as steel making, mining operations, agricultural burning (field and slash burning); and operation of fireplaces and woodstoves.

**Passive Management:** Refers to approaches that minimize human involvement while still maintaining desired goals and outcomes.

**Perennial Stream:** A stream that flows continuously. Perennial streams are generally associated with a water table in the localities through which they flow.

**Permit:** A short-term, revocable authorization to use BLM-managed lands for specific purposes, Section 302 of the Federal Land Policy and Management Act provides the BLM’s authority to issue permits for the use, occupancy, and development of BLM-managed lands. Permits are issued for purposes such as commercial or noncommercial filming, advertising displays, commercial or noncommercial croplands,

apiaries, harvesting of native or introduced species, temporary or permanent facilities for commercial purposes (does not include mining claims), residential occupancy, construction equipment storage sites, assembly yards, oil rig stacking sites, mining claim occupancy if the residential structures are not incidental to the mining operation, and water pipelines and well pumps related to irrigation and non-irrigation facilities. The regulations establishing procedures for the processing of these permits are found in 43 CFR 2920.

**Permitted Use (grazing):** The forage allocated by, or under the guidance of, an applicable land use plan for livestock grazing in an allotment under a permit or lease, expressed in animal unit months (43 CFR 4100.0-5) (from H-4180-1, BLM Rangeland Health Standards Manual).

**Permittee (Livestock Operator):** A person or organization legally permitted to graze a specific number and class of livestock on designated areas of BLM-managed land during specified seasons each year.

**Petrified Wood:** Fossilization of wood through introduction or replacement by silica (silicified wood) in such a manner that the original form and structure of the wood is preserved.

**Phased Restoration:** Any restoration project where multiple steps/phases are used to protect and/or restore natural process and functions.

**Physiographic Region:** Region of similar geologic structure and climate with a unified history of land formation.

**Planning Area:** All lands within the boundaries of Grand Staircase-Escalante National Monument, regardless of jurisdiction.

**Planning Criteria:** Planning criteria guide development, revision, or amendment of the RMP to ensure it is tailored to the issues previously identified and that the BLM avoids unnecessary data collection and analysis (43 CFR 1610.4-2(a)). Planning criteria provide the framework for the estimation of effects (43 CFR 1610.4-6).

**Prescribed Fire:** Any fire ignited by management action to meet specific objectives. A written, approved prescribed fire plan must exist, and National Environmental Policy Act requirements must be met, prior to ignition (from H-9214-1, BLM Prescribed Fire Management Handbook).

**Prey Species:** An animal taken by a predator as food.

**Primitive and Unconfined Recreation:** Visitors may have opportunities for primitive and unconfined types of recreation when the sights, sounds, and evidence of other people are rare or infrequent, where the use of the area is through nonmotorized, nonmechanical means, and where no or minimal developed recreation facilities are encountered (from BLM Instruction Memorandum 2003-275, Change 1, Considerations of Wilderness Characteristics in Land Use Plans, Attachment 1).

**Properly Functioning Condition (PFC):** (1) An element of the Fundamentals of Rangeland Health for watersheds, and therefore a required element of State or regional standards and guidelines under 43 CFR 4180.2(b). (2) Condition in which vegetation and ground cover maintain soil conditions that can sustain

natural biotic communities. For riparian areas, the process of determining function is described in BLM Technical Reference 1737-9. (3) Riparian-wetland areas are functioning properly when adequate vegetation, landform, or large woody debris is present to dissipate stream energy associated with high water flows, thereby reducing erosion and improving water quality; filter sediment, capture bed load, and aid floodplain development; improve floodwater retention and groundwater recharge; develop root masses that stabilize streambanks against cutting action; develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses; and support greater biodiversity. The functioning condition of riparian-wetland areas is influenced by geomorphic features, soil, water, and vegetation. (4) Uplands function properly when the existing vegetation and ground cover maintain soil conditions capable of sustaining natural biotic communities. The functioning condition of uplands is influenced by geomorphic features, soil, water, and vegetation. See also *Functioning at Risk* (from H-4180-I, BLM Rangeland Health Standards Manual).

**Property of Traditional Religious and Cultural Importance:** A form of heritage resource referenced within 36 CFR Part 800; a tangible property (district, site, building, structure, or object) that is associated with cultural practices or beliefs of a living community that (1) are rooted in that community's history and (2) are important in maintaining the cultural identity of the community. The significance of these properties lies in the role that they play in a community's historically rooted beliefs, customs, and practices. This term may be considered synonymous with traditional cultural property (TCP; see *Traditional Cultural Property*) and, like TCPs, properties of traditional religious and cultural importance may or may not meet the National Register of Historic Places criteria.

**Proposed Species:** Species that have been officially proposed for listing as threatened or endangered by the Secretary of the Interior. A proposed rule has been published in the *Federal Register* (from BLM Manual 6840, Special Status Species Manual).

**Public Land:** Land or interest in land owned by the United States and administered by the Secretary of the Interior through the BLM without regard to how the United States acquired ownership, except lands located on the Outer Continental Shelf, and land held for the benefit of Indians, Aleuts, and Eskimos (from H-1601-I, BLM Land Use Planning Handbook).

**Public Land Survey System Dataset:** This dataset is part of the Cadastral National Spatial Data Infrastructure publication dataset for rectangular and non-rectangular Public Land Survey System data. This dataset represents the geographic information systems version of the Public Land Survey System; it is not for boundary determination.

**Range Improvement:** An authorized physical modification or treatment designed to improve production of forage; change vegetation composition; control patterns of use; provide water; stabilize soil and water conditions; and restore, protect, and improve the condition of rangeland ecosystems to benefit livestock, wild horses and burros, and fish and wildlife. The term includes, but is not limited to, structures, treatment projects, and use of mechanical devices or modifications achieved through mechanical means (43 CFR 4100.0-5) (from H-4180-I, BLM Rangeland Health Standards Manual).

**Rangeland:** A kind of land on which the native vegetation, climax, or natural potential consists predominantly of grasses, grass-like plants, forbs, or shrubs. Rangeland includes lands revegetated naturally or artificially to provide a non-crop plant cover that is managed like native vegetation. Rangeland may

consist of natural grasslands, savannahs, shrublands, most deserts, tundra, alpine communities, coastal marshes, and wet meadows (from H-4180-1, BLM Rangeland Health Standards Manual).

**Rangeland Analysis Platform:** A remote-sensing data set that uses Landsat imagery to estimate the percent cover of coarse functional groups (annual forbs and grasses, perennial forbs and grasses, shrubs, and trees) annually; variation is seen in the year-to-year estimates; therefore, for this analysis, the BLM used average values over a 10-year period.

**Rangeland Health Standards:** The four standards of physical and biological condition or degree of function required for healthy sustainable rangeland in Utah are the following (from BLM's 1997 Standards for Rangeland Health and Guidelines for Grazing Management for BLM Lands in Utah):

1. Watersheds are in, or are making significant progress toward, properly functioning physical condition, including their upland, riparian/wetland, and aquatic components; soil and plant conditions support water infiltration, soil moisture storage, and release of water that are in balance with climate and landform, and maintain or improve water quality, water quantity, and timing and duration of flow.
2. Ecological processes, including the hydrologic cycle, nutrient cycles, and energy flow, are maintained, or there is significant progress toward their attainment, in order to support healthy biotic populations and communities.
3. Water quality complies with State water quality standards and achieves, or is making progress toward achieving, established BLM management objectives such as meeting wildlife needs.
4. Habitats are, or are making significant progress toward being, restored or maintained for federal threatened and endangered species, federal proposed, federal candidate, other special status species, native species, and for economically valuable game species and livestock.

**Raptors:** Birds of prey, such as the eagle, falcon, hawk, owl, or vulture.

**Reasonably Foreseeable Future Actions:** Actions for which there are existing decisions, funding, formal proposals, or which are highly probable, based on known opportunities or trends.

**Recreational River Areas:** Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past (from Section 2(b) of the Wild and Scenic Rivers Act).

**Recreational Shooting:** The discharge of firearms (as defined in Utah Code 76-10-501) for recreational purposes. This definition excludes the discharge of firearms when lawfully hunting protected and non-protected wildlife (as defined in Utah Code 23A or other applicable law), and when verifying firearm accuracy immediately prior to and during the lawful hunting activity.

**Reference Plant Community.** Vegetation communities that display a range of ecological conditions that exhibit natural variability, unaltered by anthropogenic agents and exotic species.

**Research Natural Area (RNA):** An area that is established and maintained for the primary purpose of research and education because the land has one or more of the following characteristics:

- A typical representation of a common plant or animal association
- An unusual plant or animal association
- A threatened or endangered plant or animal species
- A typical representation of common geologic, soil, or water features
- Outstanding or unusual geologic, soil, or water features

**Right-of-Way (ROW):** BLM-managed lands authorized to be used or occupied for the construction, operation, maintenance, and termination of a project, pursuant to a ROW authorization.

**Riparian Area:** A form of wetland transition between permanently saturated wetlands and upland areas. A riparian area is defined as an area of land directly influenced by permanent (surface or subsurface) water. Riparian areas exhibit vegetation or physical characteristics that reflect the influence of permanent surface or subsurface water. Typical riparian areas include lands along, adjacent to, or contiguous with perennially and intermittently flowing rivers and streams, glacial potholes, and the shores of lakes and reservoirs with stable water levels. Excluded are ephemeral streams or washes that lack vegetation and depend on free water in the soil.

**Riparian Vegetation:** Plants adapted to moist growing conditions along streams, waterways, ponds, etc.

**Route:** A path, way, trail, road, or other established travel corridor.

**Sacred Site:** Any specific, discrete, narrowly delineated location on federal land that is identified by an Indian tribe, or individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by practitioners of an Indian religion; provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site (Executive Order 13007, section 1(b)(iii)).

**Scenic Backways:** Paved or unpaved routes that have roadsides or corridors of special aesthetic, cultural, or historic value in more remote, less-visited locations. The corridor may contain outstanding scenic vistas, unusual geologic features, or other intrinsic qualities such as cultural, historic, natural, recreational, and archaeological values. Scenic Backways can be designated at either the State level or by the BLM during the land use planning process.

**Scenic Byways:** Highway routes that have roadsides or corridors of special aesthetic, cultural, or historic value. The corridor may contain outstanding scenic vistas, unusual geologic features, or other intrinsic qualities such as cultural, historic, natural, recreational, and archaeological values. Scenic Byways can be designated at either the state or the federal level.

**Scenic Quality:** The relative worth of a landscape from a visual perception point of view.

**Scenic River:** Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads (from Section 2(b) of the Wild and Scenic Rivers Act).

**Scoping:** An early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action. This involves the participation of affected federal, state, and local agencies, and any affected Indian tribe, the proponent of the action, and other interested persons.

**Season of Use:** The timing of livestock grazing on a rangeland area.

**Section 7 Consultation:** The requirement of Section 7 of the Endangered Species Act that all federal agencies consult with the U.S. Fish and Wildlife Service or the National Marine Fisheries Service if a proposed action may affect a federally listed species or its critical habitat.

**Section 106 Compliance:** The requirement of Section 106 of the National Historic Preservation Act that any project funded, licensed, permitted, or assisted by the federal government be reviewed to take into account the effect the undertaking may have on historic properties, and that the State Historic Preservation Officer and the Advisory Council on Historic Preservation are afforded the opportunity to comment.

**Section 106 Consultation:** As defined in the Advisory Council on Historic Preservation's regulations (36 CFR 800.16(f)), the process of seeking, discussing, and considering the views of other participants, and, where feasible, seeking agreement with them regarding matters arising in the Section 106 process.

**Seed Collection:** Refers to the collection of vegetative seeds from BLM-managed surface land. There are four options that allow the public to collect vegetative materials such as seed from BLM-managed surface lands. These are: (1) recreational use, (2) personal use, (3) commercial use, and (4) free use. The forms used and fees assessed depend on which option applies to the situation and the intended use of the seed. Seed collection on BLM-managed surface land is generally administered in accordance with BLM Instruction Memorandum 2013176.

**Sensitive Species:** Those species designated by a State Director, usually in cooperation with the State agency responsible for managing the species and State natural heritage programs, as sensitive. They are those species that: (1) could become endangered in or extirpated from a State, or within a significant portion of its distribution; (2) are under status review by the U.S. Fish and Wildlife Service and/or National Marine Fisheries Service; (3) are undergoing significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution; (4) are undergoing significant current or predicted downward trends in population or density such that federally listed, proposed, candidate, or State-listed status may become necessary; (5) typically have small and widely dispersed populations; (6) inhabit ecological refugia or other specialized or unique habitats; or (7) are State-listed but may be better conserved through application of BLM sensitive species status (from BLM Manual 6840, Special Status Species Manual).

**Sensitivity Levels:** Measures of public concern (that is, high, moderate, and low) for the maintenance of scenic quality.

**Siting Criteria:** Criteria used to locate a project. The criteria are typically site specific and dependent on the impacts from a proposed action.

**Sky Glow (Ratio of Artificial Sky Brightness to Natural Sky Brightness):** Increased apparent brightness of the night sky, compared with natural levels of brightness produced by the Milky Way and zodiacal light, associated with artificial sources of light that reduce visibility for astronomical observation. Lower ratio-to-natural-brightness values correspond to less sky glow and deviation from the natural condition; high values correspond to skies with increased light pollution.

**Sky Luminance:** Measurement of visible light on a clear, moonless night. For pristine night skies, this is typically measured as 21.9 to 22.0 magnitudes per square arcsecond. Lower values correspond to artificially brighter night skies, obscuring visibility of natural night sky phenomena; higher values (closer to 22.0) correspond to more pristine night skies.

**Soil Ecology:** The study of the interactions among soil organisms and between biotic and abiotic aspects of the soil environment.

**Solitude:** The state of being alone or remote from habitations or the sights and sounds of other people; the experience of a lonely, unfrequented, or secluded place.

**Sound-Attenuation Features:** Equipment installed on noise-generating facilities or equipment to suppress sound or reduce noise levels during their operation.

**Soundscapes:** The human perception of the physical sound resource.

**Special Recreation Management Area (SRMA):** An administrative unit where the existing or proposed recreation opportunities and recreation setting characteristics are recognized for their unique value, importance, or distinctiveness, especially compared with other areas used for recreation.

**Special Status Species:** Includes proposed species, listed species, and candidate species under the Endangered Species Act; State-listed species; and BLM State director-designated sensitive species (see BLM Manual 6840, Special Status Species Policy) (from H-1601-I, BLM Land Use Planning Handbook).

**Standard:** A description of the physical and biological conditions or degree of function required for healthy, sustainable lands (such as Land Health Standards). To be expressed as a desired outcome (goal) (from H-1601-I, BLM Land Use Planning Handbook).

**Standards for Boundary Evidence:** Standards for secondary sources of boundary evidence; these three sources are (1) land description review, (2) chain of surveys, and (3) a physical inspection of the land. Execution of the Standards for Boundary Evidence process is intended to identify defections in the boundary and give guidance to managers to manage risks associated with transactions or projects.

**Stratigraphy:** The branch of geology that treats the formation, composition, sequence, and correlation of stratified rocks as part of the earth's crust.

**Sulfur dioxide:** A gas produced by burning coal, most notably in power plants. Some industrial processes, such as production of paper and smelting of metals, produce sulfur dioxide. Sulfur dioxide is closely related to sulfuric acid, a strong acid. Sulfur dioxide plays an important role in the production of acid rain.

**Suppression:** All the work of extinguishing or containing a fire, beginning with its discovery.

**Surface Disturbance:** Suitable habitat is considered disturbed when it is removed and unavailable for immediate use. (A) Long-term removal occurs when habitat is physically removed through activities that replace suitable habitat with long-term occupancy of unsuitable habitat such as a road, power line, well pad, or active mine. Long-term removal may also result from any activities that cause soil mixing, soil removal, and exposure of the soil to erosive processes. (B) Short-term removal occurs when vegetation is removed in small areas but restored to suitable habitat within a few (fewer than 5) years of disturbance. (C) Suitable habitat rendered unusable due to numerous anthropogenic disturbances. (D) Anthropogenic surface disturbances are surface disturbances meeting the above definitions that result from human activities.

**Surface-Disturbing Activities:** An action that alters the vegetation, surface/near-surface soil resources, and/or surface geologic features, beyond natural site conditions and on a scale that affects other BLM-managed land values. Examples of surface-disturbing activities may include operation of heavy equipment to construct roads, pits, and reservoirs; installation of pipelines and power lines; and intensive vegetation management (such as prescribed fire). Surface-disturbing activities may be either authorized or prohibited.

**Surface Management Agency:** This depicts federal land for the United States and classifies this land by its active federal surface-managing agency.

**Threatened Species:** Any species likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range (from BLM Manual 6840, Special Status Species Manual).

**Topography:** The accurate and detailed description of a place; the arrangement of the natural and artificial physical features of an area.

**Total Dissolved Solids (TDS):** The total quantity (reported in milligrams per liter) of dissolved materials in water.

**Total Maximum Daily Load:** An estimate of the total quantity of pollutants (from all sources: point, nonpoint, and natural) that may be allowed into waters without exceeding applicable water quality criteria (from H-1601-I, BLM Land Use Planning Handbook).

**Traditional Cultural Landscapes:** Landscapes can be defined as large-scale properties often composed of multiple, linked features that form a cohesive area or place. They have cultural and historical meanings attached to them by the peoples who have traveled, used, and interwoven these places into generations of practice.

**Traditional Cultural Property (TCP):** A property that is eligible for inclusion in the National Register of Historic Places based on its associations with the cultural practices, traditions, beliefs, lifeways, arts, crafts, or social institutions of a living community. Traditional cultural properties are rooted in a traditional community's history and are important in maintaining the continuing cultural identity of the community (from the U.S. Department of Interior, National Park Service National Register Bulletin 38).

**Travel Management Areas (TMAs):** Polygons or delineated areas where travel management (either motorized or non-motorized) requires particular focus. These areas may be designated as open, closed, or limited to motorized use and will typically have an identified or designated network of roads, trails, ways, and other routes that provide for public access and travel across the planning area. All designated



---

travel routes within TMAs should have a clearly identified need and purpose, as well as clearly defined activity types, modes of travel, and seasons or times for allowable access or other limitations.

**Trend in Range Condition:** An interpretation of the direction of change in range condition. These determinations may relate to ecological site or forage conditions. Also, vegetation trend that is improving (upward), not changing (static), and declining (downward).

**Unallotted (Grazing):** An area that is available for livestock grazing under section 3 or section 15 of the Taylor Grazing Act for permits or leases, but currently does not have a permit. Also referred to as a vacant allotment.

**Uncharacteristic Wildland Fire:** Uncharacteristic to the frequency and intensity within the natural fire regime.

**Upland:** Refers to areas that receive no extra moisture beyond ambient precipitation.

**Utility:** A service provided by a public utility, such as electricity, telephone, or water.

**Utility Corridor:** A parcel of land that has been identified by law, by secretarial order, through a land use plan, or by other management decision as being the preferred location for existing and future right-of-way grants and suitable to accommodate one type of right-of-way or one or more rights-of-way that are similar, identical, or compatible.

**Valid Existing Rights:** Any authorization or right established. Valid existing rights are established by various laws, leases, and filings made with the BLM.

**Vector:** The mechanism for transporting weed seed, including natural (wind and wildlife) and human-caused (vehicles and humans) processes.

**Vegetation Condition Class:** This represents the general level to which current vegetation is different from the estimated historical vegetation reference conditions. There are six classes describing the amount of departure: IA (very low), IB (low), IIA (moderate to low), IIB (moderate to high), IIIA (high), and IIIB (very high).

**Vegetation Materials:** Refers generally to vegetative materials such as individual plants, wood products, flowers, seeds, etc.

**Vertebrate Species:** Any animal with a backbone or spinal column.

**Visibility (Air Quality):** A measure of the ability to see and identify objects at different distances.

**Visitor Day:** Twelve visitor hours that may be aggregated by one or more persons in single or multiple visits.

**Visual Resources Inventory (VRI):** The inventory of scenic values based on the factors of scenic quality, sensitivity levels, and distance zones that, when combined, form visual resource inventory classes; these classes indicate the existing scenic values of BLM-managed lands.

**Visual Resource Management (VRM):** The inventory and planning actions taken to identify visual values and to establish objectives for managing those values, and the management actions taken to achieve the visual management objectives.

**Visual Resource Management (VRM) Classes:** VRM categories assigned to public lands based on scenic quality, sensitivity level, and distance zones. There are four classes. Each class has an objective which prescribes the amount of change allowed in the characteristic landscape.

**Visual Resources:** The visible physical features of a landscape (topography, water, vegetation, animals, structures, and other features) that constitute the scenery of an area.

**Volatile Organic Compounds:** Include gasoline, industrial chemicals such as benzene, solvents such as toluene and xylene, and tetrachloroethylene (perchloroethylene is the principal dry-cleaning solvent). Organic chemicals all contain the element carbon. Organic chemicals are the basic chemicals found in living things and in products derived from living things, such as coal, petroleum, and refined petroleum products. Volatile chemicals readily produce vapors; at room temperature and normal atmospheric pressure, vapors escape easily from volatile liquid chemicals. Many volatile organic chemicals are also hazardous air pollutants.

**Water Quality:** The chemical, physical, and biological characteristics of water with respect to its suitability for a particular use.

**Watershed:** The fifth level of the hydrologic unit delineation system. A watershed is coded with 10 numerical digits, also referred to as a HUC-10, and watersheds range in size from 40,000 to 250,000 acres (from H-4180-1, BLM Rangeland Health Standards).

**Wetlands:** Lands including swamps, marshes, bogs, and similar areas, such as wet meadows, river overflows, mud flats, and natural ponds.

**Wild and Scenic River (WSR):** See *National Wild and Scenic River System*.

**Wild River:** Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America (from Section 2(b) of the Wild and Scenic Rivers Act).

**Wilderness Area:** An area formally designated by Congress as part of the National Wilderness Preservation System.

**Wilderness Characteristics:** The combination of biophysical, experiential, and symbolic ideals that distinguishes wilderness from other lands. The five qualities of wilderness character are Untrammeled, Undeveloped, Natural, Solitude or Primitive and Unconfined Recreation, and Unique, Supplemental, or Other Features.

**Wilderness Study Area (WSA):** Areas designated under Section 603 of the Federal Land Policy and Management Act of 1976 that were determined to possess wilderness characteristics as described in the Wilderness Act of 1964. The BLM manages WSAs to prevent impairment of their wilderness

characteristics and suitability for designation as Wilderness until Congress determines whether to add the area to the National Wilderness Preservation System or release it for multiple use purposes.

**Wildfire:** Unplanned ignition of a wildland fire (such as a fire caused by lightning, volcanoes, unauthorized and accidental human-caused fires) and escaped prescribed fires (from 2009 Guidance for Implementation of Federal Wildland Fire Management Policy).

**Wildland Fire:** Any fire, regardless of ignition source, that is burning outside a prescribed fire and any fire burning on BLM-managed lands or threatening BLM-managed land resources, where no fire prescription standards have been prepared (from H-1742-1, BLM Emergency Fire Rehabilitation Handbook).

**Wildland-Urban Interface (WUI):** The line, area, or zone in which structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.

**Withdrawal:** Removal or withholding an area of federal land from settlement, sale, location, or entry, under some or all of the general land laws and the Mining Law of 1872 for the purpose of limiting activities under those laws in order to maintain other public values in the area or reserving the area for a particular public purpose or program; or transferring jurisdiction over an area of federal land, other than “property” governed by the Federal Property and Administrative Services Act, as amended (40 United States Code 472) from one department, bureau, or agency to another department, bureau, or agency (from the Federal Land Policy and Management Act, Title 43 Chapter 35 Subchapter I 1702(j)). The term withdrawal is also used in Presidential Proclamations 6920 and 9682 to apply to mineral leasing and mineral materials sales.

**Woodland:** A forest community occupied primarily by noncommercial species such as juniper, pinon pine, mountain mahogany, or quaking aspen groves; all western juniper forestlands are considered woodlands, because juniper is classified as a noncommercial species.

**Woodland Products:** Woodland products generally refers to forest or woodland products that are found on BLM-managed lands and may be harvested for recreation or personal use.

This page intentionally left blank.

# Index

- Acquired lands, 2-136, 3-68, 3-251
- Air quality, 1-7, 1-15, 2-19, 2-22, 2-23, 2-24, 3-2, 3-3, 3-4, 3-5, 3-6, 3-7, 3-8, 3-190, 3-202, 3-204, 3-205, 3-286, 3-287, 3-288, 3-290, 3-292, 3-294, 3-296, 3-300, 3-301, 3-302, 3-303, 4-8, 4-9, 4-10
- Alternatives, Alternative A (No Action), 1-9, 1-10, 1-14, 2-1, 2-2, 2-8, 2-9, 2-15, 2-18, 2-21, 2-22, 2-25, 2-29, 2-30, 2-39, 2-48, 2-50, 2-58, 2-62, 2-68, 2-80, 2-84, 2-85, 2-87, 2-90, 2-94, 2-95, 2-99, 2-100, 2-117, 2-121, 2-134, 2-143, 2-154, 2-155, 2-156, 2-157, 2-158, 2-162, 2-163, 2-167, 2-170, 2-171, 3-6, 3-7, 3-8, 3-11, 3-12, 3-13, 3-14, 3-16, 3-17, 3-22, 3-23, 3-24, 3-25, 3-26, 3-27, 3-28, 3-39, 3-40, 3-41, 3-42, 3-43, 3-44, 3-45, 3-46, 3-47, 3-48, 3-50, 3-51, 3-53, 3-54, 3-56, 3-57, 3-58, 3-59, 3-68, 3-69, 3-70, 3-71, 3-74, 3-77, 3-80, 3-81, 3-83, 3-84, 3-85, 3-86, 3-87, 3-88, 3-92, 3-93, 3-94, 3-95, 3-96, 3-97, 3-101, 3-102, 3-103, 3-104, 3-105, 3-106, 3-107, 3-108, 3-109, 3-111, 3-114, 3-115, 3-116, 3-117, 3-118, 3-119, 3-120, 3-121, 3-122, 3-132, 3-133, 3-136, 3-137, 3-138, 3-139, 3-140, 3-141, 3-142, 3-143, 3-144, 3-152, 3-153, 3-154, 3-155, 3-156, 3-157, 3-158, 3-159, 3-160, 3-161, 3-162, 3-163, 3-164, 3-165, 3-166, 3-167, 3-168, 3-169, 3-171, 3-172, 3-174, 3-175, 3-176, 3-177, 3-178, 3-179, 3-180, 3-183, 3-184, 3-185, 3-186, 3-187, 3-188, 3-192, 3-194, 3-195, 3-197, 3-198, 3-199, 3-200, 3-201, 3-202, 3-203, 3-204, 3-205, 3-206, 3-209, 3-210, 3-211, 3-212, 3-213, 3-214, 3-215, 3-216, 3-217, 3-221, 3-224, 3-225, 3-226, 3-227, 3-228, 3-229, 3-230, 3-231, 3-232, 3-238, 3-239, 3-240, 3-241, 3-242, 3-243, 3-244, 3-245, 3-246, 3-251, 3-252, 3-253, 3-254, 3-256, 3-257, 3-258, 3-259, 3-260, 3-261, 3-263, 3-265, 3-266, 3-269, 3-270, 3-273, 3-274, 3-275, 3-276, 3-277, 3-278, 3-279, 3-280, 3-281, 3-283, 3-284, 3-285, 3-289, 3-290, 3-291, 3-292, 3-293, 3-294, 3-295, 3-296, 3-297, 3-301, 3-302, 3-303, 3-304
- Alternatives, Alternative B, 1-13, 2-2, 2-9, 2-10, 2-16, 2-21, 2-22, 2-25, 2-28, 2-30, 2-36, 2-39, 2-45, 2-48, 2-50, 2-58, 2-62, 2-65, 2-68, 2-69, 2-72, 2-80, 2-83, 2-84, 2-85, 2-87, 2-90, 2-94, 2-95, 2-99, 2-100, 2-113, 2-114, 2-117, 2-126, 2-133, 2-134, 2-141, 2-143, 2-149, 2-154, 2-155, 2-156, 2-157, 2-158, 2-162, 2-163, 2-167, 2-170, 2-171, 3-6, 3-7, 3-8, 3-12, 3-13, 3-16, 3-24, 3-25, 3-26, 3-44, 3-45, 3-46, 3-47, 3-48, 3-49, 3-53, 3-57, 3-71, 3-74, 3-77, 3-80, 3-81, 3-82, 3-84, 3-85, 3-86, 3-87, 3-88, 3-93, 3-94, 3-97, 3-103, 3-104, 3-105, 3-106, 3-107, 3-108, 3-109, 3-117, 3-118, 3-119, 3-122, 3-137, 3-138, 3-139, 3-156, 3-157, 3-158, 3-159, 3-160, 3-161, 3-162, 3-163, 3-164, 3-167, 3-168, 3-169, 3-173, 3-175, 3-176, 3-177, 3-179, 3-180, 3-183, 3-184, 3-185, 3-186, 3-187, 3-188, 3-192, 3-194, 3-197, 3-199, 3-200, 3-201, 3-202, 3-203, 3-204, 3-205, 3-210, 3-211, 3-212, 3-213, 3-215, 3-216, 3-224, 3-225, 3-226, 3-227, 3-228, 3-229, 3-231, 3-232, 3-239, 3-240, 3-241, 3-242, 3-243, 3-244, 3-245, 3-251, 3-252, 3-253, 3-254, 3-257, 3-258, 3-259, 3-260, 3-261, 3-263, 3-264, 3-265, 3-270, 3-274, 3-278, 3-279, 3-285, 3-291, 3-292, 3-293, 3-294, 3-301, 3-302, 3-303, 3-304
- Alternatives, Alternative C, 1-13, 1-14, 2-2, 2-10, 2-11, 2-12, 2-13, 2-14, 2-15, 2-18, 2-21, 2-22, 2-25, 2-30, 2-39, 2-48, 2-50, 2-58, 2-62, 2-68, 2-80, 2-84, 2-85, 2-87, 2-90, 2-94, 2-95, 2-99, 2-117, 2-123, 2-134, 2-143, 2-154, 2-155, 2-157, 2-158, 2-162, 2-163, 2-167, 2-170, 2-171, 3-7, 3-8, 3-12, 3-13, 3-16, 3-25, 3-26, 3-27, 3-28, 3-49, 3-50, 3-51, 3-52, 3-54, 3-57, 3-59, 3-71, 3-74, 3-77, 3-82, 3-83, 3-84, 3-85, 3-87, 3-94, 3-95, 3-96, 3-97, 3-103, 3-104, 3-105, 3-106, 3-108, 3-109, 3-110, 3-111, 3-118, 3-119, 3-121, 3-139, 3-140, 3-142, 3-149, 3-160, 3-161, 3-162, 3-163, 3-166, 3-167, 3-168, 3-169, 3-173, 3-175, 3-176, 3-180, 3-183, 3-185, 3-186, 3-192, 3-194, 3-197, 3-201, 3-202, 3-203, 3-204, 3-205, 3-206, 3-211, 3-212, 3-213, 3-216, 3-217, 3-218, 3-224, 3-225, 3-228, 3-229,

- 3-230, 3-231, 3-232, 3-233, 3-242, 3-243, 3-244, 3-245, 3-246, 3-252, 3-253, 3-254, 3-258, 3-259, 3-265, 3-270, 3-274, 3-278, 3-285, 3-292, 3-293, 3-294, 3-296, 3-297, 3-303, 3-304
- Alternatives, Alternative D, 1-13, 2-2, 2-12, 2-13, 2-14, 2-15, 2-21, 2-22, 2-25, 2-30, 2-36, 2-39, 2-44, 2-45, 2-48, 2-50, 2-58, 2-62, 2-65, 2-67, 2-68, 2-69, 2-72, 2-80, 2-83, 2-84, 2-85, 2-87, 2-90, 2-94, 2-95, 2-99, 2-114, 2-117, 2-126, 2-134, 2-141, 2-143, 2-154, 2-155, 2-157, 2-158, 2-162, 2-163, 2-167, 2-170, 2-171, 3-7, 3-8, 3-13, 3-17, 3-25, 3-26, 3-27, 3-28, 3-37, 3-52, 3-53, 3-54, 3-55, 3-56, 3-57, 3-62, 3-71, 3-74, 3-77, 3-85, 3-86, 3-87, 3-95, 3-96, 3-99, 3-103, 3-104, 3-105, 3-106, 3-107, 3-109, 3-110, 3-111, 3-119, 3-120, 3-121, 3-122, 3-141, 3-142, 3-149, 3-160, 3-162, 3-163, 3-164, 3-165, 3-166, 3-168, 3-173, 3-176, 3-177, 3-178, 3-180, 3-183, 3-186, 3-187, 3-192, 3-194, 3-197, 3-203, 3-204, 3-208, 3-212, 3-217, 3-224, 3-225, 3-229, 3-230, 3-231, 3-244, 3-245, 3-246, 3-250, 3-253, 3-254, 3-259, 3-260, 3-265, 3-266, 3-269, 3-270, 3-274, 3-275, 3-279, 3-280, 3-285, 3-294, 3-295, 3-296, 3-303, 3-304
- Alternatives, Alternative E (Proposed Plan), 1-1, 1-10, 1-11, 1-12, 1-13, 1-15, 2-1, 2-2, 2-3, 2-5, 2-13, 2-14, 2-15, 2-16, 2-18, 2-21, 2-22, 2-25, 2-30, 2-39, 2-48, 2-50, 2-58, 2-62, 2-68, 2-80, 2-84, 2-85, 2-87, 2-90, 2-94, 2-95, 2-97, 2-99, 2-102, 2-117, 2-134, 2-143, 2-154, 2-155, 2-157, 2-158, 2-162, 2-163, 2-167, 2-170, 2-171, 3-1, 3-8, 3-13, 3-17, 3-27, 3-28, 3-57, 3-58, 3-59, 3-60, 3-61, 3-71, 3-74, 3-77, 3-87, 3-88, 3-89, 3-96, 3-97, 3-102, 3-103, 3-104, 3-105, 3-106, 3-107, 3-110, 3-111, 3-116, 3-121, 3-142, 3-143, 3-144, 3-149, 3-167, 3-168, 3-169, 3-173, 3-177, 3-180, 3-183, 3-187, 3-188, 3-192, 3-194, 3-198, 3-205, 3-206, 3-212, 3-213, 3-217, 3-221, 3-224, 3-225, 3-231, 3-232, 3-233, 3-237, 3-246, 3-253, 3-254, 3-260, 3-262, 3-265, 3-267, 3-269, 3-270, 3-271, 3-274, 3-275, 3-285, 3-296, 3-297, 3-304, 4-1, 4-3, 4-4, 4-5, 4-8
- Area of critical environmental concern (ACEC), 1-8, 1-13, 1-14, 2-6, 2-8, 2-9, 2-10, 2-11, 2-12, 2-13, 2-14, 2-19, 2-86, 2-129, 2-138, 2-149, 2-155, 2-156, 2-157, 3-12, 3-21, 3-23, 3-24, 3-25, 3-26, 3-27, 3-28, 3-105, 3-106, 3-108, 3-109, 3-110, 3-112, 3-114, 3-118, 3-119, 3-120, 3-121, 3-122, 3-135, 3-136, 3-140, 3-143, 3-152, 3-156, 3-157, 3-159, 3-160, 3-164, 3-185, 3-186, 3-188, 3-227, 3-228, 3-229, 3-237, 3-238, 3-240, 3-243, 3-249, 3-251, 3-252, 3-261, 3-262, 3-263, 3-264, 3-265, 3-266, 3-300, 4-9, 4-10
- Best Management Practice (BMP), 2-19, 2-36, 2-66, 2-84, 3-1, 3-7, 3-22, 3-39, 3-69, 3-91, 3-114, 3-150, 3-152, 3-180, 3-181, 3-184
- Biomass, 2-38, 3-38, 3-215
- Birds, migratory, 2-62, 3-145, 3-155, 3-158, 3-161, 3-163, 3-165, 3-166, 3-169
- Birds, waterfowl, 3-145
- Candidate species, 2-145
- Clean Water Act (CWA), 2-43
- Communication site, 2-71, 2-84, 2-149, 2-150, 2-151, 2-153, 2-165, 3-153, 3-255, 3-257, 3-258, 3-259, 3-260
- Council on Environmental Quality (CEQ), 3-14, 4-1, 4-2
- Cultural Resources, 1-2, 1-3, 1-4, 1-7, 1-11, 2-13, 2-18, 2-19, 2-48, 2-49, 2-50, 2-51, 2-52, 2-53, 2-121, 2-124, 2-125, 2-129, 2-131, 2-134, 2-135, 2-137, 2-150, 2-156, 2-158, 2-172, 3-99, 3-100, 3-101, 3-102, 3-103, 3-104, 3-105, 3-106, 3-107, 3-108, 3-109, 3-110, 3-111, 3-113, 3-114, 3-118, 3-119, 3-121, 3-188, 3-196, 3-227, 3-230, 3-236, 3-237, 3-238, 3-239, 3-241, 3-246, 3-248, 3-264, 3-266, 3-267, 3-271, 3-285, 3-288, 3-299, 3-300, 3-301, 3-302, 3-303, 3-304, 4-4, 4-5, 4-6, 4-7, 4-8, 4-9, 4-10
- Deer, mule, 2-151, 3-152, 3-154, 3-155, 3-156, 3-158, 3-159, 3-162, 3-163, 3-165, 3-166, 3-169, 3-256, 3-257, 3-259
- Eagle, bald, 3-146, 3-147, 3-152
- e-bike, 3-239, 3-241, 3-243, 3-245
- Elk, 1-11, 1-12, 3-147, 3-155
- Endangered species, 2-70, 2-146, 2-147, 3-286
- Endangered Species Act (ESA), 2-68, 3-31, 3-34, 3-258, 4-5
- Environmental justice, 1-9, 3-298, 3-299, 3-300, 3-301, 3-302, 3-303, 3-304
- Extensive recreation management area (ERMA), 2-3
- Extensive Recreation Management Area (ERMA), 2-3, 2-4, 2-8, 2-9, 2-11, 2-12, 2-13, 2-120, 2-128, 2-132, 3-23, 3-33, 3-42, 3-47, 3-51, 3-56, 3-59, 3-92, 3-93, 3-94, 3-96, 3-97,

- 3-102, 3-104, 3-105, 3-112, 3-115, 3-117, 3-118, 3-119, 3-135, 3-136, 3-137, 3-138, 3-139, 3-140, 3-141, 3-142, 3-143, 3-144, 3-152, 3-154, 3-156, 3-158, 3-159, 3-161, 3-163, 3-165, 3-166, 3-168, 3-169, 3-197, 3-199, 3-201, 3-203, 3-205, 3-206, 3-225, 3-228, 3-229, 3-230, 3-232, 3-234, 3-237, 3-238, 3-239, 3-242, 3-244, 3-246, 3-247, 3-291, 3-292
- Federal Land Policy and Management Act (FLPMA), 1-1, 1-10, 1-12, 2-5, 2-147, 3-123, 3-208, 3-235, 3-240, 3-248, 3-262, 4-1, 4-3
- Fire Regime Condition Class (FRCC), 2-88
- Fire, prescribed, 2-8, 2-33, 2-38, 2-76, 3-2, 3-4, 3-5, 3-6, 3-10, 3-11, 3-34, 3-38, 3-52, 3-95, 3-116, 3-153, 3-155, 3-189, 3-190, 3-199, 3-201, 3-203, 3-223, 3-300
- Fire, suppression, 2-87, 2-89, 3-8, 3-22, 3-29, 3-39, 3-49, 3-53, 3-61, 3-66, 3-85, 3-94, 3-95, 3-98, 3-116, 3-189, 3-191, 3-193, 3-195, 3-196, 3-207
- Firewood, 2-74, 2-96, 2-97, 2-98, 2-121, 2-133, 2-156, 3-213, 3-214, 3-217, 3-236, 3-245, 3-264, 3-265, 3-301
- Formation, 1-4, 2-82, 3-122, 3-123, 3-124, 3-125, 3-126, 3-127, 3-128, 3-129, 3-130, 3-131, 3-134, 3-177, 3-251, 3-286
- Fossil, 2-18, 2-59, 2-60, 2-61, 3-11, 3-122, 3-123, 3-124, 3-125, 3-126, 3-127, 3-128, 3-129, 3-130, 3-131, 3-132, 3-133, 3-134, 3-137, 3-141, 3-144
- Fuel load, 3-6, 3-11, 3-29, 3-36, 3-61, 3-92, 3-98, 3-189, 3-190, 3-193, 3-195, 3-196, 3-200, 3-201, 3-202, 3-203, 3-204, 3-206, 3-207, 3-209
- Fugitive dust, 2-22, 2-30, 3-5, 3-6, 3-7, 3-8, 3-33, 3-150, 3-223
- Geology, 1-2, 1-3, 1-4, 1-8, 2-19, 2-41, 2-58, 2-59, 2-90, 2-172, 3-122, 3-123, 3-124, 3-128, 3-129, 3-130, 3-131, 3-132, 3-133, 3-134, 3-135, 3-136, 3-137, 3-138, 3-139, 3-140, 3-141, 3-142, 3-144, 3-145, 3-248, 3-250, 3-251, 3-263, 3-266, 3-267, 3-269, 4-9, 4-11
- Grazing, allotment, 1-5, 1-13, 2-2, 2-11, 2-12, 2-15, 2-28, 2-99, 2-100, 2-101, 2-105, 2-106, 2-107, 2-108, 2-109, 2-111, 2-113, 2-114, 2-122, 2-156, 3-40, 3-54, 3-70, 3-81, 3-84, 3-87, 3-89, 3-99, 3-101, 3-113, 3-158, 3-161, 3-165, 3-168, 3-169, 3-219, 3-220, 3-221, 3-222, 3-224, 3-226, 3-227, 3-229, 3-230, 3-232, 3-242, 3-264, 3-268, 3-269, 3-291
- Grazing, management, 1-11, 2-19, 2-34, 2-99, 2-116, 3-14, 3-21, 3-29, 3-103, 3-104, 3-105, 3-107, 3-108, 3-109, 3-138, 3-141, 3-143, 3-213, 3-233, 4-2, 4-9, 4-10
- Hawk, ferruginous, 3-147
- Land tenure adjustments, 2-143, 2-145, 2-147, 2-148, 3-257, 3-258
- Leasing, terms and conditions, 2-110, 2-112, 2-145, 3-218, 3-220, 3-221, 3-224, 3-227, 3-228, 3-231
- Listed species, see Threatened and endangered species (TES), 2-71, 2-75, 2-76, 2-78, 2-145, 3-34, 3-146, 3-157, 3-164, 3-196, 3-258
- Manual treatment, 3-34, 3-35
- Mechanical treatment, 3-31, 3-34, 3-35, 3-36, 3-37, 3-38, 3-67, 3-189, 3-196
- Mexican spotted owl (MSO), 2-71, 2-72, 2-73, 3-147, 3-150, 3-151, 3-152, 3-154, 3-155, 3-156, 3-158, 3-162, 3-165, 3-166, 3-168
- Minerals, entry, 2-144, 3-133
- Minerals, material (salable), 1-9
- Mining Law of 1872, 1-9
- Mountain biking, 3-19, 3-20, 3-29, 3-67, 3-223, 3-236, 3-297
- National Ambient Air Quality Standards (NAAQS), 3-2, 3-3
- National Environmental Policy Act of 1969 (NEPA), 1-1, 1-10, 2-14, 2-15, 2-29, 2-45, 2-52, 2-53, 2-57, 2-103, 2-106, 2-107, 2-108, 2-109, 2-110, 2-128, 2-136, 2-148, 2-149, 3-4, 3-14, 3-15, 3-70, 3-81, 3-84, 3-86, 3-221, 3-224, 3-252, 3-300, 3-301, 3-302, 4-1, 4-2, 4-3, 4-7, 4-9
- National Historic Trail (NHT), 1-8, 2-19, 2-158, 3-246, 3-267, 3-268, 3-270, 4-6, 4-9, 4-10
- National Park Service, 1-5, 1-11, 1-13, 2-2, 2-37, 2-102, 2-128, 3-3, 3-4, 3-60, 3-97, 3-102, 3-110, 3-143, 3-169, 3-178, 3-181, 3-183, 3-188, 3-206, 3-218, 3-220, 3-231, 3-238, 3-275, 3-277, 4-3, 4-6
- National Register of Historic Places (NRHP), 2-125, 3-239
- National Wild and Scenic Rivers System (NWSRS), 1-8, 2-163, 2-165, 2-166, 3-276, 3-277
- Nonattainment area, 3-2
- Off-highway vehicle (OHV), 1-13, 1-14, 2-4, 2-5, 2-8, 2-9, 2-11, 2-12, 2-13, 2-19, 2-91, 2-135,

- 2-136, 2-137, 2-138, 2-139, 2-142, 2-156, 2-169, 3-5, 3-6, 3-7, 3-8, 3-10, 3-11, 3-12, 3-13, 3-18, 3-19, 3-20, 3-22, 3-23, 3-24, 3-27, 3-29, 3-33, 3-34, 3-41, 3-46, 3-50, 3-55, 3-58, 3-61, 3-67, 3-70, 3-77, 3-78, 3-79, 3-82, 3-84, 3-86, 3-89, 3-91, 3-93, 3-94, 3-96, 3-97, 3-98, 3-102, 3-103, 3-104, 3-105, 3-107, 3-108, 3-109, 3-110, 3-112, 3-113, 3-114, 3-117, 3-118, 3-119, 3-122, 3-133, 3-135, 3-136, 3-137, 3-138, 3-139, 3-140, 3-141, 3-142, 3-143, 3-144, 3-150, 3-152, 3-154, 3-156, 3-158, 3-162, 3-165, 3-166, 3-168, 3-182, 3-183, 3-184, 3-185, 3-186, 3-187, 3-188, 3-197, 3-207, 3-209, 3-210, 3-211, 3-212, 3-213, 3-215, 3-216, 3-217, 3-218, 3-222, 3-223, 3-225, 3-228, 3-229, 3-230, 3-232, 3-236, 3-237, 3-238, 3-239, 3-240, 3-243, 3-244, 3-246, 3-247, 3-248, 3-249, 3-250, 3-251, 3-252, 3-253, 3-254, 3-262, 3-263, 3-266, 3-267, 3-269, 3-270, 3-272, 3-280, 3-281, 3-287, 3-290, 3-291, 3-292, 3-294, 3-295, 3-297, 3-302, 3-303, 3-304
- Ozone (O<sub>3</sub>), 3-2
- Paleontology, 1-2, 1-3, 1-4, 1-8, 2-8, 2-19, 2-50, 2-58, 2-59, 2-60, 2-61, 2-124, 2-131, 2-149, 2-172, 3-122, 3-123, 3-124, 3-130, 3-131, 3-132, 3-133, 3-134, 3-135, 3-136, 3-137, 3-138, 3-139, 3-140, 3-141, 3-142, 3-143, 3-144, 3-145, 3-152, 3-237, 3-238, 3-241, 3-244, 3-250, 3-263, 3-266, 4-9, 4-11
- Planning issue, 1-7, 2-1
- Particulate matter (PM<sub>2.5</sub>), 3-2, 3-3, 3-4, 3-5, 3-6, 3-8
- Prehistory, 2-125, 3-99, 3-239
- Proper functioning condition (PFC), 2-31, 2-130, 3-80, 3-224, 3-239, 3-268
- Public access, 2-58, 2-60, 2-61, 2-134, 2-135, 2-137, 2-146, 2-148, 3-132, 3-137, 3-138, 3-144, 3-145, 3-268
- Raptor, 2-71, 2-73, 2-124, 2-137, 3-147, 3-151, 3-153, 3-157, 3-237, 3-241
- Recreation, dispersed, 3-33, 3-59, 3-67, 3-92, 3-140, 3-142
- Recreation, mechanized, 2-11
- Recreation, motorized, 3-33, 3-191, 3-195, 3-196, 3-223, 3-238, 3-240, 3-243
- Recreation, nonmotorized, 2-139, 3-210, 3-211, 3-212, 3-223, 3-250, 3-252, 3-253, 3-254
- Renewable energy, 2-154, 3-61, 3-98, 3-170, 3-178, 3-195, 3-207, 3-256, 3-281, 3-290, 3-292, 3-293, 3-295
- Research Natural Area (RNA), 1-13, 1-14, 2-6, 2-8, 2-9, 2-10, 2-11, 2-12, 2-13, 2-14, 2-19, 2-86, 2-129, 2-138, 2-149, 2-155, 2-156, 2-157, 3-23, 3-24, 3-26, 3-27, 3-28, 3-105, 3-106, 3-108, 3-109, 3-110, 3-112, 3-114, 3-118, 3-135, 3-140, 3-143, 3-152, 3-156, 3-157, 3-159, 3-160, 3-164, 3-185, 3-186, 3-188, 3-227, 3-228, 3-229, 3-237, 3-238, 3-240, 3-243, 3-251, 3-252, 3-261, 3-262, 3-263, 3-264, 3-265, 3-266
- Right-of-way (ROW), 2-5, 2-6, 2-10, 2-12, 2-13, 2-14, 2-27, 2-36, 2-49, 2-59, 2-71, 2-83, 2-91, 2-149, 2-150, 2-151, 2-154, 2-156, 2-160, 2-165, 2-169, 3-3, 3-19, 3-20, 3-23, 3-24, 3-25, 3-26, 3-27, 3-28, 3-29, 3-33, 3-34, 3-43, 3-48, 3-51, 3-52, 3-56, 3-57, 3-59, 3-60, 3-61, 3-68, 3-70, 3-74, 3-75, 3-76, 3-80, 3-82, 3-84, 3-86, 3-88, 3-89, 3-92, 3-93, 3-94, 3-95, 3-96, 3-97, 3-98, 3-102, 3-103, 3-104, 3-105, 3-106, 3-107, 3-108, 3-109, 3-110, 3-111, 3-112, 3-115, 3-117, 3-118, 3-120, 3-121, 3-133, 3-134, 3-136, 3-137, 3-138, 3-139, 3-141, 3-142, 3-144, 3-145, 3-150, 3-153, 3-157, 3-164, 3-170, 3-178, 3-193, 3-194, 3-195, 3-199, 3-201, 3-202, 3-203, 3-204, 3-205, 3-206, 3-207, 3-209, 3-210, 3-211, 3-212, 3-218, 3-222, 3-223, 3-227, 3-229, 3-230, 3-232, 3-246, 3-247, 3-248, 3-255, 3-256, 3-257, 3-258, 3-259, 3-260, 3-261, 3-263, 3-264, 3-265, 3-266, 3-269, 3-270, 3-275, 3-277, 3-278, 3-279, 3-280, 3-281, 3-290, 3-292, 3-293, 3-295, 3-297
- Rights-of-way (ROW), 1-13, 2-5, 2-8, 2-10, 2-12, 2-13, 2-36, 2-71, 2-134, 2-143, 2-144, 2-145, 2-149, 2-150, 2-151, 2-152, 2-153, 2-160, 2-165, 3-19, 3-20, 3-22, 3-29, 3-33, 3-51, 3-56, 3-59, 3-61, 3-89, 3-92, 3-97, 3-98, 3-105, 3-107, 3-108, 3-109, 3-111, 3-113, 3-117, 3-118, 3-137, 3-138, 3-139, 3-141, 3-142, 3-143, 3-145, 3-153, 3-157, 3-160, 3-163, 3-164, 3-167, 3-188, 3-193, 3-195, 3-199, 3-201, 3-202, 3-203, 3-204, 3-205, 3-206, 3-207, 3-209, 3-210, 3-211, 3-212, 3-222, 3-225, 3-248, 3-249, 3-255, 3-256, 3-257, 3-258, 3-259, 3-260, 3-261, 3-278



- Seeding, 2-35, 3-11, 3-36, 3-37, 3-38, 3-40, 3-44, 3-49, 3-53, 3-153, 3-155, 3-159, 3-166, 3-191, 3-268
- Sensitive species, 3-34, 3-146, 3-147
- Socioeconomics, 3-282, 3-286, 4-10
- Soils, 1-7, 2-9, 2-25, 2-27, 2-28, 2-29, 2-34, 2-95, 3-5, 3-6, 3-17, 3-18, 3-19, 3-20, 3-21, 3-22, 3-23, 3-24, 3-25, 3-26, 3-27, 3-28, 3-29, 3-36, 3-38, 3-66, 3-67, 3-68, 3-69, 3-70, 3-80, 3-81, 3-82, 3-83, 3-84, 3-86, 3-88, 3-89, 3-134, 3-150, 3-191, 3-217, 3-223, 3-244, 3-300, 4-10, 4-11
- Soils, erodible, 2-136, 2-137, 3-24, 3-27
- Soils, fragile, 3-24, 3-26, 3-28
- Special recreation management area (SRMA), 2-3, 2-4, 2-8, 2-9, 2-11, 2-12, 2-13, 2-117, 2-119, 2-120, 2-128, 2-132, 3-23, 3-33, 3-42, 3-47, 3-51, 3-56, 3-59, 3-92, 3-93, 3-94, 3-96, 3-97, 3-102, 3-104, 3-105, 3-112, 3-115, 3-117, 3-118, 3-119, 3-135, 3-136, 3-137, 3-138, 3-139, 3-140, 3-141, 3-142, 3-143, 3-144, 3-152, 3-154, 3-156, 3-158, 3-159, 3-161, 3-163, 3-165, 3-166, 3-168, 3-169, 3-197, 3-199, 3-201, 3-203, 3-205, 3-206, 3-225, 3-228, 3-229, 3-230, 3-232, 3-234, 3-237, 3-238, 3-239, 3-240, 3-242, 3-244, 3-246, 3-247, 3-291, 3-292
- Special status plants, 3-32, 3-35, 3-37, 3-38, 3-39, 3-199
- Special status species, 1-8, 2-62, 2-68, 2-69, 2-70, 2-71, 2-74, 2-75, 2-77, 2-89, 3-32, 3-34, 3-38, 3-39, 3-44, 3-45, 3-46, 3-47, 3-48, 3-49, 3-50, 3-51, 3-53, 3-54, 3-55, 3-56, 3-58, 3-59, 3-146, 3-149, 3-150, 3-151, 3-152, 3-154, 3-155, 3-158, 3-159, 3-161, 3-163, 3-165, 3-166, 3-167, 3-168, 3-169, 3-170, 3-191, 3-196, 3-199, 3-201, 3-203, 3-241, 3-249
- Surface water, 1-7, 2-27, 2-41, 2-43, 3-22, 3-24, 3-25, 3-26, 3-28, 3-62, 3-66, 3-67, 3-68, 3-69, 3-81, 3-84, 3-88, 3-89, 3-191, 3-200, 3-303, 4-10
- Threatened and endangered species (TES), 2-124, 2-147, 3-257, 4-5
- Timber harvest, 2-38, 2-96, 2-97, 3-44, 3-214, 3-215, 3-223
- Total Maximum Daily Loads (TMDL), 3-65, 3-66
- Travel and Transportation Management (TTM), 2-4, 2-5, 2-19, 2-134, 3-185, 3-186, 3-187, 3-188
- Treatment, chemical, 3-35, 3-36, 3-37, 3-39, 3-53, 3-67, 3-95
- Treatment, manual, 3-34, 3-35
- Treatment, mechanical, 3-31, 3-34, 3-35, 3-36, 3-37, 3-38, 3-67, 3-189, 3-196
- Treatment, vegetation, 2-33, 2-35, 2-66, 3-40, 3-44, 3-49, 3-53, 3-57, 3-67, 3-191, 3-193, 3-196, 3-268
- Utility corridor, 2-36, 2-82, 2-143, 2-149, 2-151, 2-152, 2-160, 2-165, 3-80, 3-175, 3-176, 3-177, 3-246, 3-255, 3-256, 3-257, 3-258, 3-259, 3-260, 3-270, 3-277, 3-278, 3-279
- Vegetation, invasive species/noxious weed, 2-34, 2-35, 2-36, 2-37, 2-77, 3-11, 3-25, 3-28, 3-33, 3-40, 3-67, 3-80, 3-90, 3-91, 3-92, 3-93, 3-96, 3-97, 3-98, 3-153, 3-155, 3-170, 3-191, 3-193, 3-204, 3-213, 3-214
- Vegetation, Perennial grass, 3-34, 3-35, 3-36, 3-37, 3-38, 3-39, 3-53, 3-91, 3-92, 3-95, 3-155, 3-193
- Vegetation, pinyon-juniper, 1-4, 3-30, 3-31, 3-32, 3-34, 3-35, 3-36, 3-39, 3-61, 3-146, 3-147, 3-148, 3-170, 3-190, 3-193, 3-225
- Vegetation, ponderosa pine, 1-4, 2-31, 2-95, 2-96, 2-97, 3-146, 3-213, 3-214, 3-215, 3-216, 3-218
- Vegetation, Riparian, 1-7, 2-10, 2-11, 2-13, 2-14, 2-31, 2-36, 2-40, 2-62, 2-97, 2-98, 2-110, 2-128, 2-130, 2-134, 2-135, 2-146, 2-147, 3-29, 3-31, 3-39, 3-40, 3-41, 3-42, 3-43, 3-45, 3-46, 3-47, 3-48, 3-50, 3-51, 3-52, 3-54, 3-55, 3-56, 3-57, 3-58, 3-59, 3-60, 3-64, 3-66, 3-68, 3-80, 3-81, 3-82, 3-85, 3-86, 3-87, 3-88, 3-97, 3-114, 3-116, 3-134, 3-150, 3-151, 3-154, 3-155, 3-156, 3-166, 3-168, 3-170, 3-193, 3-200, 3-215, 3-216, 3-218, 3-219, 3-221, 3-224, 3-226, 3-227, 3-228, 3-230, 3-238, 3-239, 3-257, 3-269, 3-271, 3-288, 3-289, 3-302, 4-10
- Vegetation, Sagebrush, 2-30, 3-30, 3-31, 3-32, 3-39, 3-61, 3-151, 3-166, 3-189, 3-190, 3-196, 3-199, 3-207, 3-216
- Vegetation, wetlands, 1-7, 2-10, 2-11, 2-36, 2-67, 3-29, 3-39, 3-64, 3-66, 3-68, 3-80, 3-81, 3-82, 3-85, 3-87, 3-146, 3-150, 3-164, 3-228, 3-286, 4-10
- Viewshed, 1-8, 2-158, 2-159, 3-267, 3-269, 3-270, 3-273, 3-274, 3-275
- Visual resource inventory (VRI), 2-81, 2-82, 3-170, 3-171, 3-172, 3-175

- Visual resource management (VRM), 1-13, 1-14, 2-2, 2-80, 2-81, 2-82, 2-83, 2-91, 2-151, 2-153, 2-160, 2-162, 2-165, 2-169, 3-110, 3-135, 3-136, 3-137, 3-138, 3-140, 3-141, 3-142, 3-143, 3-144, 3-170, 3-171, 3-172, 3-173, 3-174, 3-175, 3-176, 3-177, 3-178, 3-209, 3-210, 3-211, 3-212, 3-246, 3-270, 3-273, 3-274, 3-275, 3-278, 3-279, 3-280, 3-281, 3-282
- Water quality, 1-7, 1-8, 2-40, 2-43, 2-165, 2-166, 3-64, 3-66, 3-67, 3-68, 3-69, 3-70, 3-80, 3-81, 3-82, 3-84, 3-85, 3-86, 3-87, 3-88, 3-89, 3-114, 3-116, 3-150, 3-151, 3-219, 3-276, 3-277, 3-278, 3-279, 3-299, 3-301, 3-302, 3-303, 3-304, 4-10
- Water, groundwater, 1-7, 2-41, 2-43, 2-47, 3-62, 3-66, 3-68, 3-69, 3-70, 3-80, 3-85, 3-87, 3-89, 3-200, 3-286, 3-289, 3-300, 3-303, 4-10
- Water, rights, 2-44, 2-165, 3-62, 3-66, 3-300
- Water, surface water, 1-7, 2-27, 2-41, 2-43, 3-22, 3-24, 3-25, 3-26, 3-28, 3-62, 3-66, 3-67, 3-68, 3-69, 3-81, 3-84, 3-88, 3-89, 3-191, 3-200, 3-303, 4-10
- Watershed, 1-4, 1-13, 1-15, 2-4, 2-9, 2-11, 2-14, 2-15, 2-25, 2-26, 2-30, 2-32, 2-39, 2-40, 2-42, 2-43, 2-95, 2-97, 2-99, 2-104, 2-113, 2-114, 2-119, 3-18, 3-24, 3-25, 3-27, 3-28, 3-40, 3-44, 3-49, 3-54, 3-61, 3-62, 3-63, 3-64, 3-66, 3-67, 3-70, 3-71, 3-74, 3-77, 3-80, 3-81, 3-82, 3-83, 3-84, 3-85, 3-86, 3-87, 3-88, 3-89, 3-93, 3-96, 3-98, 3-157, 3-164, 3-166, 3-169, 3-200, 3-202, 3-204, 3-205, 3-207, 3-214, 3-215, 3-217, 3-218, 3-226, 3-227, 3-228, 3-230, 3-276, 4-6
- Wild and Scenic River, 1-13, 2-6, 2-19, 2-81, 2-163, 2-165, 3-276, 3-277, 3-278, 4-8, 4-9, 4-10
- Wilderness characteristics, 1-8, 1-14, 2-2, 2-9, 2-10, 2-11, 2-12, 2-13, 2-14, 2-19, 2-81, 2-82, 2-86, 2-90, 2-91, 2-92, 2-93, 2-97, 2-127, 2-149, 2-165, 2-169, 3-12, 3-23, 3-24, 3-25, 3-26, 3-27, 3-28, 3-105, 3-106, 3-108, 3-109, 3-112, 3-114, 3-116, 3-118, 3-119, 3-120, 3-121, 3-138, 3-140, 3-142, 3-143, 3-152, 3-157, 3-160, 3-164, 3-173, 3-175, 3-176, 3-177, 3-184, 3-185, 3-191, 3-192, 3-195, 3-198, 3-200, 3-201, 3-202, 3-204, 3-206, 3-208, 3-209, 3-210, 3-211, 3-212, 3-213, 3-215, 3-216, 3-218, 3-222, 3-225, 3-227, 3-228, 3-229, 3-230, 3-232, 3-240, 3-243, 3-245, 3-249, 3-251, 3-252, 3-279, 3-280, 3-281, 3-282, 3-290, 3-291, 3-292, 3-294, 3-296, 3-297, 3-300, 3-302, 4-9, 4-10
- Wilderness study area (WSA), 1-8, 1-13, 2-7, 2-19, 2-67, 2-167, 2-168, 2-169, 3-157, 3-195, 3-196, 3-214, 3-227, 3-229, 3-230, 3-232, 3-240, 3-251, 3-262, 3-267, 3-279, 3-280, 3-281, 3-282, 4-9, 4-10
- Wildland Fire, 2-87, 2-88, 2-89, 3-61, 3-82, 3-85, 3-87, 3-89, 3-98, 3-114, 3-116, 3-190, 3-191, 3-199, 3-200, 3-203, 3-205, 3-207, 3-208, 3-279
- Winter range, big game, 2-63, 2-66, 3-145, 3-146, 3-154, 3-155, 3-161, 3-163, 3-165, 3-166, 3-168, 3-169, 3-237
- Withdrawal, 2-143, 2-144, 3-262