



U.S. Department of the Interior  
Bureau of Land Management  
Royal Gorge Field Office  
Cañon City, Colorado



U.S. Department of Agriculture  
U.S. Forest Service  
Pike and San Isabel NFs & Cimarron and Comanche National Grasslands  
Salida, Colorado

# Planning Assessment

Browns Canyon National Monument Management Plan / EIS

February 2018



This page intentionally left blank.

---

---

1 **Browns Canyon National Monument**  
2 **Management Plan – Environmental**  
3 **Impact Statement**

4 **Planning Assessment Report**

5 **FINAL**

6 Prepared by

7 **U.S. Department of the Interior**  
8 **Bureau of Land Management**  
9 **Royal Gorge Field Office**  
10 **Cañon City, Colorado**

11 **and**

12 **U.S. Department of Agriculture**  
13 **Forest Service**  
14 **Pike and San Isabel National Forests & Cimarron and Comanche National**  
15 **Grasslands**  
16 **Salida, Colorado**

17  
18 **February 2018**  
19

---

This page intentionally left blank.

---

---

# TABLE OF CONTENTS

1			
2	<b>1.0</b>	<b>INTRODUCTION.....</b>	<b>1</b>
3	1.1	Overview of Browns Canyon National Monument .....	1
4		1.1.1 Proclamation 9232 .....	1
5		1.1.2 Overview of Resources, Objects, and Values .....	1
6	1.2	Management Plan Background .....	3
7		1.2.1 Management Planning Framework .....	3
8		1.2.2 Mandates and Authorities .....	5
9		1.2.3 Process Participants .....	5
10		1.2.4 Planning Process Overview .....	5
11	1.3	Description of Planning Area and Decision Area.....	7
12	1.4	Purpose of the Planning Assessment .....	9
13		1.4.1 Best Available Scientific Information .....	9
14	1.5	Overview of Drivers and Stressors .....	11
15		1.5.1 Climate Change.....	11
16		1.5.2 Pests and Wildfire.....	11
17		1.5.3 Surface Disturbing Activities.....	12
18		1.5.4 Increased Public Access and Recreation Use .....	12
19	1.6	Overview of Existing Management Direction .....	12
20	<b>2.0</b>	<b>ECOSYSTEMS, RESOURCES, CONDITIONS, AND TRENDS .....</b>	<b>24</b>
21	2.1	Resources .....	24
22		2.1.1 Air Quality .....	24
23		2.1.2 Climate .....	35
24		2.1.3 Geology and Minerals.....	45
25		2.1.4 Paleontological Resources .....	56
26		2.1.5 Soils and Watersheds .....	61
27		2.1.6 Water Resources (Surface, Ground, and Floodplains).....	75
28		2.1.7 Terrestrial Vegetation .....	81
29		2.1.8 Wildland Fire Ecology.....	96
30		2.1.9 Wetlands and Riparian Resources .....	103
31		2.1.10 Aquatic Wildlife.....	113
32		2.1.11 Terrestrial and Avian Wildlife .....	118
33		2.1.12 Special Status Species.....	133
34		2.1.13 Cultural Resources .....	151
35		2.1.14 Tribal Concerns.....	157
36		2.1.15 Visual Resources.....	160
37		2.1.16 Lands with Wilderness Characteristics.....	171
38	2.2	Resource Uses.....	174
39		2.2.1 Recreation (including SRMA) .....	174

1	2.2.2	Travel and Transportation Management.....	198
2	2.2.3	Range and Livestock Grazing.....	207
3	2.2.4	Land Use Authorizations, Rights-of-Way and Withdrawals.....	217
4	2.3	Special Designations (ACEC, WSR, WSA, Roadless Areas).....	223
5	2.3.1	Assessment Area.....	224
6	2.3.2	Best Available Scientific Information.....	224
7	2.3.3	Limitations/Data Gaps.....	225
8	2.3.4	Existing Conditions and Trends.....	225
9	2.3.5	Existing Management Direction.....	228
10	2.3.6	Needs for Change and Management Opportunities.....	230
11	<b>3.0</b>	<b>CONSISTENCY WITH OTHER PLANS AND COOPERATING</b>	
12		<b>AGENCIES.....</b>	<b>232</b>
13	3.1	Potential Cooperating Agencies.....	232
14	3.1.1	Potential Federal Agency Cooperators.....	232
15	3.1.2	Potential State Agency Cooperators.....	232
16	3.1.3	Potential County Cooperators.....	233
17	3.1.4	Potential Community Cooperators.....	233
18	3.1.5	Potential Tribal Cooperators.....	233
19	3.1.6	Other Potential Cooperators.....	233
20	3.1.7	Government to Government Consultation.....	234
21	<b>4.0</b>	<b>SPECIFIC MANDATES AND AUTHORITY.....</b>	<b>235</b>
22	4.1	Introduction.....	235
23	4.1.1	Federal Regulatory Context.....	235
24	<b>5.0</b>	<b>LIST OF PREPARERS.....</b>	<b>242</b>
25		<b>APPENDIX A – ROV TABLE.....</b>	<b>A-1</b>
26		<b>APPENDIX B – SPECIES CONSIDERED FOR U.S. FOREST SERVICE SPECIES</b>	
27		<b>OF CONSERVATION CONCERN STATUS.....</b>	<b>B-1</b>
28		<b>APPENDIX C – USFS FEDERAL REGISTER NOTICE OF INTENT TO START</b>	
29		<b>BROWNS CANYON NATIONAL MONUMENT PLAN ASSESSMENT</b>	
30		<b>PHASE.....</b>	<b>C-1</b>
31		<b>APPENDIX D – USFS AND BLM CORRELATION OF TERMS AND</b>	
32		<b>PROCESSES.....</b>	<b>D-1</b>

33

34

## LIST OF FIGURES

35	Figure 1-1	Browns Canyon National Monument and Arkansas River Valley Context Map.....	4
36	Figure 1-2	Existing Management Direction.....	13
37	Figure 2-1	Air Quality Study Area.....	31
38	Figure 2-2	Visibility Trends for White River National Forest.....	32
39	Figure 2-3	Nitrogen (N) and Sulfur (S) Deposition Trends for Gunnison National Forest.....	33
40	Figure 2-4	Colorado Statewide Annual Temperature, 1900-2012.....	41

---

1	Figure 2-5 Projected Annual Temperature and Precipitation Changes for the Western	
2	U.S. Under a Medium-Low Emissions Scenario for 2050 .....	43
3	Figure 2-6 Geological Formations in Browns Canyon National Monument.....	50
4	Figure 2-7 Soil Resources within the BCNM (BLM 2017).....	65
5	Figure 2-8 Watershed Boundaries and Streams within the BCNM.....	69
6	Figure 2-9 Existing Vegetation within the National Monument Boundary BCNM.....	87
7	Figure 2-10 Planning Area Waters within the National Monument Boundary BCNM .....	108
8	Figure 2-11 Big Game Concentration Areas within the National Monument Boundary .....	129
9	Figure 2-12 Special Status Species Habitat within BCNM .....	139
10	Figure 2-13 Current VRM and VQO Objectives within BCNM.....	168
11	Figure 2-14 Recreation, Travel and Transportation Resources .....	187
12	Figure 2-15 Grazing Allotments within BCNM .....	214
13	Figure 6-1 BLM Required Steps for RMPs (BLM Land Use Planning Handbook) .....	8
14	Figure 6-2 USFS Required Steps in Planning, NEPA, and Public Opportunities to	
15	Participate in Plan Revision (USFS 2012 Planning Rule) (bold italicized	
16	text indicates differences between USFS and BLM RMP process). .....	9

17

18

## LIST OF TABLES

19	Table 1-1 BCNM Land Ownership, Special Designations and Plans .....	8
20	Table 1-2 Existing Management Direction for Resource, Objects and Values .....	14
21	Table 2-1 Existing Emissions in the Region.....	29
22	Table 2-2 Needs for Change and Management Opportunities for Air Quality.....	34
23	Table 2-3 Geological Formations in Browns Canyon National Monument .....	52
24	Table 2-4 Needs for Change and Management Opportunities for Geology and Minerals .....	55
25	Table 2-5 Paleontological Resources Potential within Browns Canyon National	
26	Monument.....	59
27	Table 2-6 Acres of Paleontological Potential within the Browns Canyon National	
28	Monument by PFYC.....	60
29	Table 2-7 Needs for Change and Management Opportunities for Paleontological	
30	Resources .....	61
31	Table 2-8 Description of BLM Soil Mapped Units .....	66
32	Table 2-9 Description of USFS Soil Mapped Units .....	66
33	Table 2-10 Watershed Health Assessment in the BCNM.....	71
34	Table 2-11 Developed Routes, Trails, Campsites, Day Use Areas, Parking Lots and Boat	
35	Launches in BCNM .....	72
36	Table 2-12 Needs for Change and Management Opportunities for Soils and Watersheds .....	74
37	Table 2-13 Needs for Change and Management Opportunities for Water .....	81
38	Table 2-14 Vegetation Communities and Land Cover within BCNM .....	86
39	Table 2-15 Noxious Weeds within 5-miles of the Arkansas River Corridor.....	88
40	Table 2-16 Needs for Change and Management Opportunities for Vegetation .....	95

---

1	Table 2-17 Fire Regime Groups in BCNM.....	99
2	Table 2-18 Mean Fire Return Intervals in BCNM.....	100
3	Table 2-19 Vegetation Condition Class in BCNM.....	100
4	Table 2-20 Needs for Change and Management Opportunities for Wildland Fire Ecology .....	103
5	Table 2-21 Wetlands within BCNM.....	107
6	Table 2-22 PFC Ratings for Stream Channel Reaches within the BCNM .....	110
7	Table 2-23 Needs for Change and Management Opportunities for Wetlands and Riparian	
8	Resources .....	112
9	Table 2-24 Needs for Change and Management Opportunities for Aquatic Wildlife.....	118
10	Table 2-25 Needs for Change and Management Opportunities for Terrestrial and Avian	
11	Wildlife .....	133
12	Table 2-26 BCNM Special Status Species Evaluation .....	140
13	Table 2-27 Needs for Change and Management Opportunities for Special Status Species .....	151
14	Table 2-28 Survey Reports .....	153
15	Table 2-29 Needs for Change and Management Opportunities for Tribal Concerns .....	160
16	Table 2-30 BLM Visual Resource Management Class Objectives .....	162
17	Table 2-31 Correlation of USFS VMS and SMS Terminology and Objectives.....	163
18	Table 2-32 USFS Scenic Integrity Levels (Scenery Management System) .....	164
19	Table 2-33 Correlation of BLM VRM and USFS SMS Objectives .....	165
20	Table 2-34 BLM Visual Resource Management Classes and USFS VMS Visual Quality	
21	Levels for BCNM .....	167
22	Table 2-35 Needs for Change and Management Opportunities for Visual Resources .....	171
23	Table 2-36 Lands with Wilderness Characteristics Inventory Units in the BCNM .....	172
24	Table 2-37 Needs for Change and Management Opportunities for Lands with Wilderness	
25	Characteristics.....	173
26	Table 2-38 Available Visitation Data .....	177
27	Table 2-39 Annual Visitation Estimate for Pike-San Isabel Forest.....	183
28	Table 2-40 AHRA Recreation Use Summary.....	184
29	Table 2-41 Segment 2 Commercial Use .....	186
30	Table 2-42 SRPs within or Adjacent to BCNM.....	186
31	Table 2-43 Needs for Change and Management Opportunities for Recreation.....	197
32	Table 2-44 Needs for Change and Management Opportunities for Travel and	
33	Transportation .....	207
34	Table 2-45 Grazing Allotments within BCNM .....	210
35	Table 2-46 AUMs on USFS Allotments within BCNM.....	211
36	Table 2-47 AUMs within BLM Allotments within BCNM.....	212
37	Table 2-48 Needs for Change and Management Opportunities for Range and Livestock	
38	Grazing.....	216
39	Table 2-49 BLM ROWs within BCNM.....	219
40	Table 2-50 Needs for Change and Management Opportunities for Land Use	
41	Authorizations, Rights-of-Way and Withdrawals.....	222
42	Table 2-51 Needs for Change and Management Opportunities for Special Designations .....	230



---

1 Table 6-1 Agency Correlation of Terms ..... 1

2

3

## **ACRONYMS AND ABBREVIATIONS**

ACEC	Area of Critical Environmental Concern
AHRA	Arkansas Headwaters Recreation Area
AMS	Analysis of the Management Situation
amsl	Above mean sea level
AQRV	Air Quality Related Value
ARKWELCO	Arkansas River Gauge near Wellsville
AHRA-MP	Arkansas Headwaters Recreation Area Management Plan
AUM	Animal Unit Month
BASI	Best Available Scientific Information
BCNM	Browns Canyon National Monument
BEIG	Built Environment Image Guide
BGEPA	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
BMP	best management practice
CAA	Clean Air Act
CASTNET	Clean Air Status and Trends Network
CDOT	Colorado Department of Transportation
CDPHE	Colorado Department of Public Health and Environment
CFR	Code of Federal Regulations
CMA	Cooperative Management Agreement
CML	Cooperative Management Lands
CNHP	Colorado Natural Heritage Program
CPW	Colorado Parks and Wildlife
CRA	Colorado Roadless Area
CSU	Controlled Surface Use
DOI	Department of the Interior
EA	Environmental Assessment
EIS	Environmental Impact Statement

---

EO	Executive Order
EPA	Environmental Protection Agency
EPCA	Energy Policy and Conservation Act
ERMA	Extensive Recreation Management Area
ESA	Endangered Species Act
FAR	Functioning At-Risk
FLPMA	Federal Land Policy and Management Act
FMU	Fire Management Unit
FO	Field Office
FSH	Forest Service Handbook
FSM	Forest Service Manual
GAO	General Accounting Office
GAP	Gap Analysis Program
GHG	greenhouse gas
GIS	Geographic Information System
HUC	Hydrologic Unit Code
IAP	Integrated Activity Plan
IDT	Interdisciplinary Team
IM	Instruction Memorandum
LiDAR	Light detection and ranging
LRMP	Land and Resource Management Plan
LUP	Land Use Planning
MBTA	Migratory Bird Treaty Act
MIS	Management Indicator Species
MMT	million metric tons
MP	Management Plan
MP-EIS	Management Plan and Environmental Impact Statement
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NAMF	National Aquatic Monitoring Framework
NEPA	National Environmental Policy Act

---

NF	Not Functioning
NFMA	National Forest Management Act
NFS	National Forest System
NGD	National Hydrography Dataset
NHPA	National Historic Preservation Act
NRA	National Recreation Area
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSO	No Surface Occupancy
NWI	National Wetland Inventory
NWSRS	National Wild and Scenic River System
OHV	Off-highway Vehicle
ORV	Off-road Vehicle
OSMRE	Office of Surface Mining Reclamation and Enforcement
PA	Planning Assessment
PFC	Proper Functioning Condition
PFYC	Potential Fossil Yield Classification
PSICC	Pike and San Isabel National Forests Cimarron and Comanche National Grasslands
RGFO	Royal Gorge Field Office
RGRMP	Royal Gorge Resource Management Plan
RMIS	Recreation Management Information System
RMP	Resource Management Plan
RN	Roaded Natural
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
ROVs	Resources, Objects, and Values
ROW	Right-of-Way
SCC	Species of Conservation Concern
SIL	Scenic Integrity Levels
SIO	Scenic Integrity Objectives
SMS	Scenery Management System

---

SPM	Semi-Primitive Motorized
SPNM	Semi-Primitive Non-Motorized
SRMA	Special Recreation Management Area
SRP	Special Recreation Permit
TM	Travel Management
USC	United States Code
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VCC	Vegetation Condition Class
VDEP	Vegetation Departure
VMS	Visual Management System
VQO	Visual Quality Objectives
VRI	Visual Resource Inventory
VRM	Visual Resource Management
WBD	Watershed Boundary Dataset
WCC	Watershed Condition Class
WSA	Wilderness Study Area
WSR	Wild and Scenic Rivers

1 **1.0 INTRODUCTION**

2 **1.1 Overview of Browns Canyon National Monument**

3 Browns Canyon National Monument (BCNM) is located in central Colorado east of the  
4 Collegiate Peaks mountain range, midway between the cities of Salida and Buena Vista in  
5 Chaffee County. The BCNM covers 21,604 acres of scenic and diverse natural resources along  
6 the upper Arkansas River (Figure 1-1).

7 The new monument encompasses Bureau of Land Management (BLM) and U.S. Forest Service  
8 (USFS) lands and includes the Arkansas River Special Recreation Management Area (SRMA),  
9 the Browns Canyon Wilderness Study Area (WSA), the Browns Canyon Area of Critical  
10 Environmental Concern (ACEC), and the USFS Aspen Ridge roadless area (Table 1-1). BLM  
11 and USFS will work across jurisdictional boundaries in this planning effort to include Forest  
12 System lands and BLM public lands.

13 In addition, the monument will include a portion of the Arkansas Headwaters Recreation Area  
14 (AHRA), a cooperatively managed area along the Arkansas River administered by the USFS, the  
15 BLM, and Colorado Parks and Wildlife (CPW).

16 **1.1.1 Proclamation 9232**

17 On February 19, 2015, President Barack Obama issued Proclamation 9232, which established the  
18 BCNM. The proclamation describes the unique resources, objects, and values (ROVs) that are  
19 found in the monument.

20 The protection afforded by Proclamation 9232 will preserve the Browns Canyon area's  
21 prehistoric and historic legacy and maintain its diverse array of scientific resources, ensuring that  
22 the prehistoric, historic, and scientific values remain for the benefit of all Americans. The area  
23 also provides world class river rafting and outdoor recreation opportunities, including hunting,  
24 fishing, hiking, camping, mountain biking, and horseback riding.

25 **1.1.2 Overview of Resources, Objects, and Values**

26 Appendix A presents the agency interpretation of ROVs contained in the Presidential  
27 Proclamation. The following ROVs were identified and are summarized below:

- 28 • Scenic Resources: Colorful rock outcroppings; stunning mountain vistas; Browns  
29 Canyon; iconic canyons landscape with rivers and forests.
- 30 • Cultural Resources: history of human habitation (seasonal camps, open campsites,  
31 culturally modified trees, wickiups, tipi rings, chipped stone manufacture and processing  
32 sites , a possible ceramic pottery kiln, traditional cultural property, ceremonial features);  
33 abandoned mine sites, Denver Rio Grande 1 Railroad bed, historical resources.

- 1 • Native and Modern Peoples: Ancestors, Ute, Apache, Eastern Shoshone, proto-  
2 Comanche (Numuna) split, Comanche, Eastern Shoshone, and Buffalo-Eater Band;  
3 Spanish explorer Juan de Ulibarri; recent settlers; mining communities; Chaffee County  
4 residents and visitors.
- 5 • Scientific Resources: biodiversity; significant herd of bighorn sheep; scientifically  
6 significant geological, ecological, riparian, cultural, and historic resources.
- 7 • Geology: 3,000-foot range in elevation, Río Grande rift system, 1.6 billion year-old  
8 Precambrian granodiorite batholith; rugged granite cliffs; steep gulches; pink granite;  
9 Stafford Gulch; reef formation; glacial cirques; mesa-like terraces; moraines; gold; silver;  
10 semi-precious gems; mining booms; and garnets.
- 11 • Paleontology: Pennsylvanian exposures; minturn formation; belden shale; invertebrate  
12 fossils; shell fossils; ancient reef; bivalves; brachiopods; gastropods; echinoids;  
13 nautiloids; conodonts; crinoids; bryozoans; vertebrates; sharks; bony fish; future  
14 paleontological research.
- 15 • Vegetation Biodiversity; One of the most significant regions for biodiversity in Colorado  
16 with forest communities of semi-arid piñon-juniper, mountain mahogany woodlands,  
17 ponderosa pine, Rocky Mountain bristlecone pine, aspen, willow, Rocky Mountain  
18 juniper, river birch and narrowleaf cottonwood riparian areas.
- 19 • Vegetation: Blue grama; Mountain muhly; Indian ricegrass; Arizona fescue; Blue  
20 bunchgrass; Prickly pear; Cholla; Yucca; Alpine bluegrass; Brandegees buckwheat;  
21 Scarlet gilia; Larkspur; Fendler's Townsend-daisy; Fendler's false cloak-fern; Livemore  
22 fiddleleaf; Front-Range alumroot.
- 23 • Terrestrial Wildlife: Mountain lions; bighorn sheep; mule deer; bobcat; red and gray fox;  
24 american black bear; coyote; american pine marten; kangaroo rat; elk; tree and ground  
25 squirrels; canada lynx.
- 26 • Raptors Other Avian Wildlife: A stunning diversity of other bird species such as red-  
27 tailed hawk; Swainson's hawk; golden eagle; turkey vulture; prairie falcon; peregrine  
28 falcon; cliff swallow; Canada (gray) jay, mourning dove; Northern Flicker; blue jay; wild  
29 turkey; great horned owl; western screech-owl; and Saw-whet owl.
- 30 • Aquatic and Riparian Wildlife: Boreal toad; northern leopard frog, and one of the only  
31 riparian ecosystems along the Arkansas River that remains relatively undisturbed and  
32 contains an intact biotic community.
- 33 • Recreation: world class river rafting, hunting, fishing, hiking, camping, mountain biking,  
34 horseback riding; wildlife and bird viewing; garnet collection that attracts visitors from  
35 around the world.
- 36 • Research: important area for studies of paleoecology, mineralogy, archaeology, climate  
37 change, geology, wildland fire, disturbances, plant and animal communities, and micro  
38 riparian, iron fens, and springs.

- Travel and Transportation: Pre-historic and historic transportation corridor, Arkansas Stage and Rail Trail, access for recreation and ranching.

## **1.2 Management Plan Background**

Proclamation 9232 establishing the monument directs the Secretaries of the Interior and Agriculture "to jointly prepare a management plan for the monument" to protect and restore the monument's ROVs, pursuant to their respective applicable legal authorities, to implement the purposes of the proclamation.

An environmental impact statement (EIS) will be prepared as part of the MP revision. An EIS is a document required by the National Environmental Policy Act (NEPA) for Federal Government agency actions "significantly affecting the quality of the human environment." A tool for decision making, an EIS describes the positive and negative environmental effects of a proposed agency action and cites alternative actions.

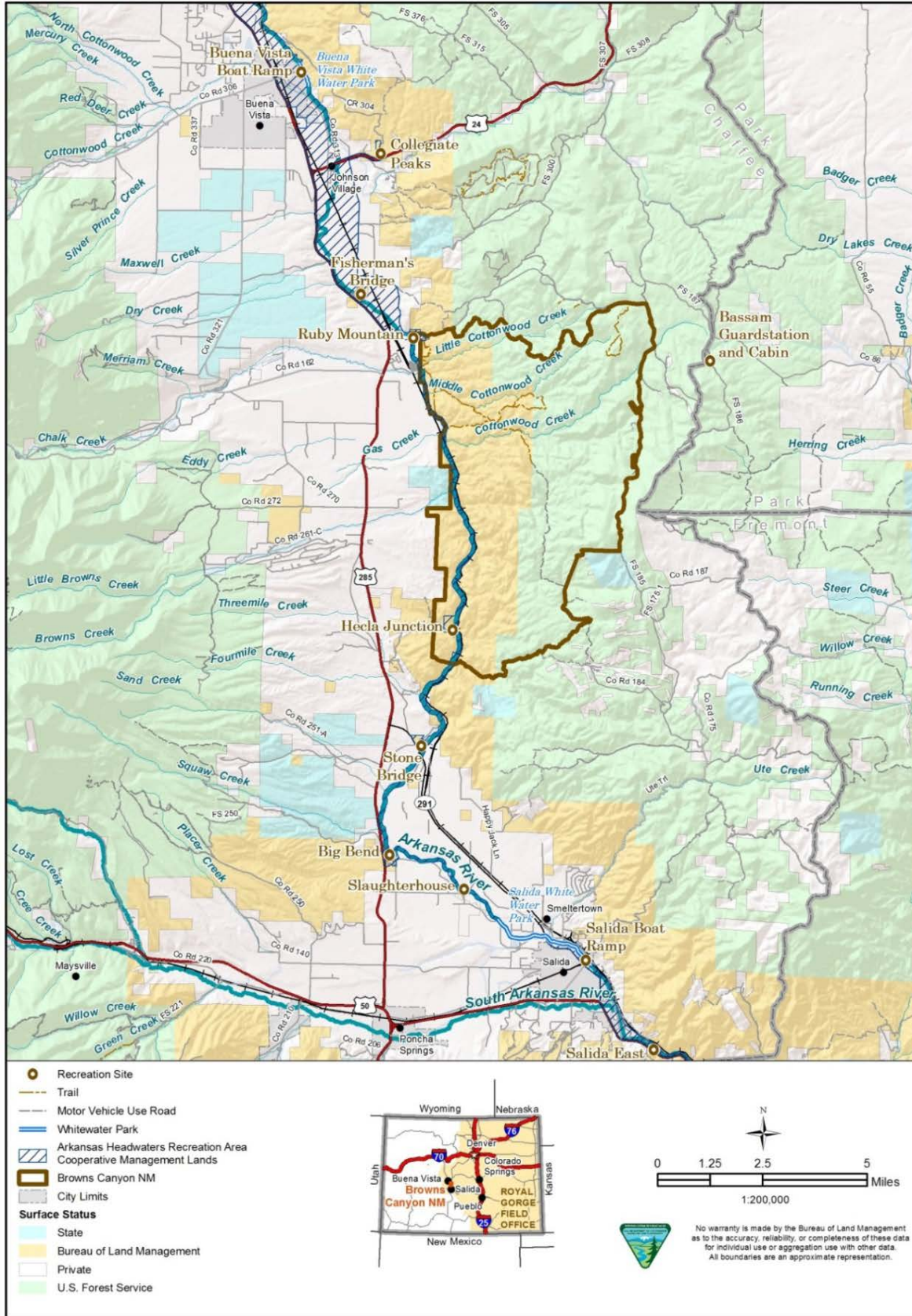
In the development and implementation of the BCNM Management Plan – Environmental Impact Statement (MP-EIS), Proclamation 9232 further directs the Secretaries to “maximize opportunities, pursuant to applicable legal authorities, for shared resources, operational efficiency, and cooperation.” Therefore, the BLM and the USFS will work across jurisdictional boundaries in this planning effort to include Forest System lands and BLM public lands.

### **1.2.1 Management Planning Framework**

The management plan will comply with both agencies' planning and management mandates, establish a comprehensive interagency approach, and provide a mechanism for communication, consultation, and coordination between the two agencies.

This joint plan between the BLM and the USFS will be structured to meet the planning needs of each agency, specifically BLM Handbook H-1601-1 and USFS 2012 Planning Rule. The MP-EIS will make allocation decisions that follow the direction of the presidential proclamation, while complying and remaining consistent with the mandates of Federal Land Policy and Management Act (FLPMA) and National Forest Management Act (NFMA). The MP-EIS will be consistent with the BLM's 6220 Manual – National Monuments, National Conservation Areas, and similar designations. Since BCNM includes a Wilderness Study Area (WSA), the BLM will also provide management that is consistent with the BLM's 6330 Manual – Management of Wilderness Study Areas.

Proclamation 9232 directs that the lands administered by the BLM be managed as a unit of the National Landscape Conservation System, pursuant to applicable legal authorities, including provisions of section 603 of FLPMA governing the management of WSAs. The proclamation further directs that lands administered by the USFS be managed as part of the Pike and San Isabel National Forests and Cimarron and Comanche National Grasslands (PSICC).



1  
2 **Figure 1-1 BCNM and Arkansas River Valley Context Map**



## **1.2.2 Mandates and Authorities**

The foundation of public land management is the mandates and authorities provided in laws, regulations, and Executive orders. The mandates and authorities governing the BCNM MP-EIS are: Presidential Proclamation 9232 of February 19, 2015, Establishment of the Browns Canyon National Monument; FLPMA (1976); NFMA (1976); Antiquities Act (1906); National Historic Preservation Act (1966); Wilderness Act (1964); and NEPA.

The BLM planning process (as described in 43 CFR 1600) is authorized and mandated through two important laws: the Federal Land Policy and Management Act of 1976 (FLPMA) and NEPA.

The USFS planning process (as described in 36 CFR 219) is authorized and mandated through Forest and Rangeland Renewable Resources Planning Act of 1974, as amended by the National Forest Management Act of 1976 (16 U.S.C. 1600 et seq.) and NEPA. Management direction must also comply with 36 CFR 294, specifically the Colorado Roadless Rule. See also Section 4.0.

## **1.2.3 Process Participants**

The BLM and USFS have determined that operational efficiency in the monument planning and NEPA process can be achieved through co-lead Federal agencies, joint interpretation and coordination of agency specific planning rules, shared BLM-USFS interdisciplinary team participation, coordination, collaborative budgeting, and joint consultation with State, local, and tribal governments. The BLM will act as the co-lead agency in the planning process with USFS. CPW will participate as a cooperating agency.

Proclamation 9232 directs the Secretaries, through the BLM and USFS, to provide for public involvement in the development of the management plan including, but not limited to, consultation with tribal, State, and local governments (see Chapter 4.0). The BLM and USFS are coordinating closely with CPW and Chaffee County to ensure meaningful public involvement throughout the planning process. Specific considerations are access, communications, interpretation with Chaffee County and the cities of Buena Vista and Salida, and strengthening partnerships.

## **1.2.4 Planning Process Overview**

On April 18, 2017, USFS issued a notice of intent (NOI) in the Federal Register to formally invite the public to engage in a collaborative process to identify relevant baseline information and local knowledge to be considered in the assessment phase. The information provided by the public was incorporated into this this Planning Assessment.

The BLM and USFS also invited the public to share their values and visions for the future of the BCNM through participatory research and mapping of monument special places and resource interactions from October 2016 - June 2017. Study results published by BLM are available for

- 1 review at the BLM MP-EIS website in the report Social Landscape of the Browns Canyon  
2 National Monument (August 2017).
- 3 • The BLM and USFS will invite members of the public to share their visions for the future  
4 of the BCNM and comment on the remaining major steps and supporting tasks of the  
5 land use planning process. For specific opportunities, please visit the BCNM MP-EIS  
6 website: <https://go.usa.gov/xn2eC>. BLM will employ scoping, per 40 CFR 1501.7, as an  
7 open process for determining the scope of issues to be addressed in the BCNM MP-EIS  
8 and for identifying the significant issues related to a proposed action. Below are the  
9 remaining major steps and supporting tasks of the land use planning process: Internal  
10 scoping:
    - 11 ○ Agency identified management issues and concerns
  - 12 • External Scoping- Conduct public scoping:
    - 13 ○ Publish notice of intent to prepare a MP-EIS.
    - 14 ○ Develop planning criteria and identify planning opportunities.
    - 15 ○ Invite the public to participate, and analyze public comments.
    - 16 ○ Identify issues raised by the public.
    - 17 ○ Refine issue descriptions and prepare a scoping report.
  - 18 • Prepare alternatives and impact analysis strategy:
    - 19 ○ Prepare draft alternatives.
    - 20 ○ Refine planning criteria and purpose and need.
    - 21 ○ Prepare draft basis for analysis report.
    - 22 ○ Public review of draft alternatives and basis for analysis.
    - 23 ○ Prepare report(s) with final alternatives and basis for analysis to be used in the  
24 Draft MP/EIS.
  - 25 • Prepare Draft MP/EIS:
    - 26 ○ Refine issues, formulate management alternatives, and conduct impact analysis.
    - 27 ○ Public review of the Draft MP-EIS.
  - 28 • Prepare proposed MP/Final EIS:
    - 29 ○ Address public comments and make changes as appropriate.
    - 30 ○ Develop a “proposed alternative.”
    - 31 ○ Provide a protest period and Governor’s consistency review.
    - 32 ○ Resolve all protests.
  - 33 • Prepare Record of Decision (ROD) and Approved MP:
    - 34 ○ Identify selected alternative.

### 1.3 Description of Planning Area and Decision Area

The BCNM is currently managed under the following land use plans and activity level plans:

- Royal Gorge Resource Area Management Plan (RGRMP/ROD) 1996
- Arkansas Headwaters Recreation Area Management Plan (AHRA-MP) 2001
- Pike and San Isabel National Forests and Cimarron and Comanche National Grasslands (PSICC) Land and Resource Management Plan (LRMP) 1984

The BLM is currently revising the RGRMP and the AHRA-MP. The RGRMP, addressed in the Eastern Colorado RMP (see <http://on.doi.gov/1HVULcA>), is expected to be published as a Draft RMP/EIS in 2018; the Final RMP/EIS in 2019; with a ROD by end of 2019. The revised AHRA-MP (see <http://cpw.state.co.us/placestogo/parks/ArkansasHeadwatersRecreationArea/Pages/AHRA-Plan-Revision.aspx>) is expected to be complete in 2018. The BCNM MP-EIS will be an amendment to the current PSICC LRMP.

All of the public land within the BCNM is subject to various management prescriptions associated with existing special designations as described below.

The BLM administers 9,793 acres of lower elevation terrain and drainages within the monument, including public lands along the Browns Canyon portion of the Arkansas River. Table 1-1 shows the BLM acres that are currently designated as Browns Canyon WSA, Browns Canyon ACEC, Arkansas River SRMA, and BLM lands without a special designation. In addition, all BLM lands in the BCNM are also managed as part of the Arkansas River SRMA. The entire length of the Arkansas River on BLM lands within the BCNM is classified as a Suitable –Recreational Wild and Scenic River. See Section 2.3 for an assessment of these special designations.

PSICC administers 11,811 acres of upper elevation terrain and drainages west and downslope from the Aspen Ridge Road (USFS Road 185) within the monument. The Pike and San Isabel National Forests are currently completing an environmental impact statement (EIS) for travel management. The Public Motor Vehicle Use EIS is being prepared to analyze and disclose to the public the environmental, social, and economic impacts of designating roads, trails, and areas for public motor vehicle use on all National Forest System (NFS) lands within the BCNM. Table 1-1 shows the USFS acres that are currently designated as roadless areas. Ninety five (95) percent or approximately 11,185 acres of NFS lands within the BCNM are designated as the Aspen Ridge Colorado Roadless Areas (CRA) unit. See Section 2.3 for an assessment of these special designations.

Under a Cooperative Management Agreement (CMA) with the BLM and USFS, CPW manages recreation on Cooperative Management Lands (CML), which are defined as the area adjacent to the river where recreation related activities occur (Figure 1-1 and Table 1-1). The CML is wholly contained within the Arkansas River SRMA. Arkansas River recreation implementation level, or step-down, decisions are found in the AHRA-MP, such as activity emphasis, recreation

1 outcomes, setting characteristics and site development. River recreation in the CML is managed  
 2 according to the AHRA-MP with deference to the monument designation and ROVs. If BCNM  
 3 MP-EIS decisions do not allow the AHRA-MP to be in conformance, an amendment to the  
 4 AHRA-MP would be necessary.

**Table 1-1 BCNM Land Ownership, Special Designations and Plans**

Land Management Agency/Unit	Acres
<b>BCNM (Total)</b>	<b>21,604</b>
<b><i>USFS Lands</i></b>	<b><i>11,811*</i></b>
Lands addressed in the Public Motor Use Vehicle – Travel Management Plan	11,811
Roadless Areas within BCNM	11,162
Non-Roadless Areas within BCNM	649
<b><i>BLM Lands</i></b>	<b><i>9,792*</i></b>
Browns Canyon WSA (all included in BCNM)	7,463
Browns Canyon ACEC within BCNM	9,755 (7,457 overlaps Browns Canyon WSA)
Arkansas River SRMA within BCNM	9,938 (7,455 overlaps Browns Canyon WSA and 9,753 overlaps Browns Canyon ACEC)
AHRA Cooperative Management Lands	529

\*Designations on USFS and BLM do not total.

6 The following decisions are outside of the scope of the BCNM MP-EIS on account of agency  
 7 purview or a previous or ongoing planning process:

- 8 • Proclamation 9232 – The Proclamation withdrew all federal lands within the boundary of  
 9 BCNM from all forms of entry, sale, selection, sale, leasing, or other disposition subject  
 10 to valid existing rights. Additional provisions included in the proclamation limit the use  
 11 of motorized and mechanical vehicles to designated routes and limit the development of  
 12 new roads and trails for motorized use to a relatively small area located west of the  
 13 Arkansas River. The BCNM MP-EIS will not affect these decisions.
- 14 • PSICC Public Motor Use Vehicle Travel Management Plan – This USFS Travel  
 15 Management Plan is being developed as the result of a 2015 settlement agreement, and  
 16 will make decisions on non-system roads and social trails on USFS lands in the BCNM.  
 17 The BCNM MP-EIS will not affect USFS travel decisions.
- 18 • USFS Roadless Area – In 36 CFR Part 294 the U.S. Department of Agriculture (USDA)  
 19 adopted a State-specific final rule to provide management direction for conserving and  
 20 managing approximately 4.2 million acres of CRAs on NFS lands, including the Aspen  
 21 Ridge CRA.

- 1       • Browns Canyon WSA – The BCNM MP-EIS will not affect this congressional  
2       designation made after the Final Cañon City District Wilderness Environmental Impact  
3       Statement (December 1987) recommendation.

4 Opportunities to improve management and the need for changing other existing decisions and  
5 plans are found in Chapter 2.0 at the conclusion of each resource section.

## 6 **1.4 Purpose of the Planning Assessment**

7 This Planning Assessment informs subsequent steps of the MP-EIS, including preparation of a  
8 purpose and need statement, identification of planning issues, formulation of resource  
9 management alternatives, and advancing characterization of the affected environment. This  
10 assessment phase document identifies and evaluates information relevant to the issues that will  
11 be considered later in the development of plan components. This includes the conditions and  
12 trends of the resources and uses/activities; the sustainability of social, economic, and social  
13 systems (36 CFR 219.5(a)(1)); and identification and evaluation of Best Available Scientific  
14 Information (BASI) and its limitations. Resource assessments are intended to be short, concise,  
15 and focused on the issues relevant to improving resource management rather than an exhaustive  
16 review of everything known about the area.

17 Each section includes an overview of planning issues and management concerns related to the  
18 ROVs developed through internal scoping with the BLM and the BLM. These questions  
19 generally address the following:

- 20       • What decisions are necessary to conserve and protect the unique and important resources  
21       and objects of value of the monument? Specifically what decisions are necessary to  
22       protect the geological, cultural, archaeological, paleontological, natural, scientific,  
23       recreational, wilderness, wildlife, riparian, historical, educational, and scenic resources of  
24       the monument?
- 25       • What land use plan allocation and allowable use decisions are needed to protect these  
26       ROVs per the Antiquities Act protections, including scientific and tribal values, while  
27       supporting quality recreational experiences and settings envisioned by the proclamation?

### 28 **1.4.1 Best Available Scientific Information**

29 Under the 2012 USFS Planning Rule, the BASI must inform the planning process. The rule  
30 requires that the responsible official document how BASI was determined to be accurate,  
31 reliable, and relevant to the issues being considered. The BLM will make decisions using the  
32 best information available (BLM Land Use Planning Handbook, H-1601-1, p2).

33 Early in the assessment phase the USFS and BLM provided a venue for public and governmental  
34 participation, inviting submission of information, including scientific information that may be  
35 relevant to the planning process. During the scoping period, the USFS and BLM will seek public

1 comment on the Planning Assessment in order for public and governmental agencies to develop  
2 a shared understanding of the BASI and address identified data gaps.

### 3 **1.4.1.1 Characteristics of Quality Scientific Information**

4 Not all information used in the planning process is considered scientific information. Rather, the  
5 determination of the BASI is based on what scientific information is the most accurate, reliable,  
6 and relevant with regard to the planning issues. Specifically, to be:

- 7 • Relevant. The information must pertain to the issues under consideration at spatial and  
8 temporal scales appropriate to the plan area, and relevant to the conditions and trends of  
9 the 15 topics in 36 CFR 219(b) or to the sustainability of social, economic, or ecological  
10 systems (36 CFR 36 219.5(a)(1)).
- 11 • Accurate. The scientific information must estimate, identify, or describe the true  
12 condition of its subject matter. This may be a measurement of the specific conditions in  
13 the plan area, a description of operating behaviors (physical, biological, social, or  
14 economic), or an estimation of trends. Statistically, accurate information is near to the  
15 true value of its subject, quantitatively unbiased, and free of error in its methods.
- 16 • Reliable. The scientific information must have the same or comparable values each time  
17 it is measured. Reliability also reflects how appropriately the scientific methods have  
18 been applied and how consistent they are with established scientific principles. The  
19 application of quality control to the scientific information usually improves the reliability  
20 of the information.

21 In some circumstances, the BASI has been developed directly using the scientific method, with  
22 clearly stated questions, well-designed investigations, logically analyzed results, clearly  
23 documented, and subjected to peer review. However, in other circumstances the BASI may be  
24 information from analyses of data obtained from a local area, or studies to address a specific  
25 question in one area. The BASI also could be the result of expert opinion, panel consensus, or  
26 observations, as long as the responsible official has a reasonable basis for relying on that  
27 scientific information as the best available.

28 High quality and valid scientific information generally includes the following characteristics:

- 29 • The science uses well-developed scientific methods that are clearly described.
- 30 • Logical conclusions and reasonable inferences were drawn.
- 31 • The information has been appropriately peer reviewed.
- 32 • A quantitative analysis was performed using appropriate statistical or quantitative  
33 methods.
- 34 • The information is placed in proper context including spatial and temporal scales.
- 35 • References are appropriately cited.

## **1.5 Overview of Drivers and Stressors**

Each resource or resource use in Chapter 2 identifies possible system drivers and stressors (36 CFR 219.6(b)(3)) and assesses their influences on key ecosystem characteristics, per Forest Service Handbook (FSH) 1909.12. System driving processes in BCNM include the dominant ecological processes and disturbance regimes, such as natural succession, wildland fire, insect infestations or climate change. Factors that may directly or indirectly stress, degrade or impair ecosystem composition, structures or ecological processes in BCNM that impair its ecological integrity also include insect infestations, climate change, surface disturbing activities, and increased public access and recreation use. Note that insect infestations and climate change are both a system driver and a stessor.

An overview of the primary system drivers and stressors are summarized below, and additional stressors or drivers are described in greater detail in Chapter 2. The conclusion of each resource or resource use section identifies needs for changing current management and opportunities in the context of drivers and stressors.

### **1.5.1 Pests and Wildfire**

Insect infestations, including mountain pine beetle, spruce budworm, and spruce beetle exacerbated by dense tree stands and drought conditions, are resulting in large-scale stand die-off that further contributes to higher fuel loading and alters fire conditions and behavior. The current conditions in the BCNM, as is the case across much of the West, have departed from historic fire regime condition, with fire suppression over many decades contributing to increased fuel loads in the BCNM that are more susceptible to insect infestations, thereby potentially making future fires larger and more severe.

Historic wildfire suppression further contributes to insect infestations which intensifies fire conditions.

### **1.5.2 Climate Change**

There is broad scientific consensus that humans are changing the chemical composition of the Earth's atmosphere. Activities such as fossil fuel combustion, deforestation, agriculture, and other changes in land use produce greenhouse gas (GHG) emissions and are resulting in the atmospheric accumulation of GHGs. An increase in GHG concentrations results in an increase in the Earth's average surface temperature, primarily by decreasing the amount of heat energy that would normally be radiated back into space (radiative forcing). This global temperature increase is expected to affect regional weather patterns, precipitation rates, frequency and intensity of extreme weather events, average sea level rise, ocean acidification, and polar ice levels, which are collectively referred to as climate change. In Colorado, climate change is predicted to result in warmer temperatures, earlier snowmelt, and more frequent and severe droughts.

### 1 **1.5.3 Surface Disturbing Activities**

2 Historic surface disturbing activities such as mining, grazing, railroad construction and  
3 operations, recreational facility development, and the construction of roads and trails has and  
4 could continue to contribute to a variety of effects including inadvertent damage to cultural and  
5 paleontological resources, impacts to water quality, impacts to vegetation, introduction of noxious  
6 weeds, and increased streambank sedimentation and erosion.

### 7 **1.5.4 Increased Public Access and Recreation Use**

8 Recreation within the BCNM has primarily occurred along the river corridor, with high use by  
9 commercial and private water recreationists. With monument designation, recreation use is likely  
10 to increase both throughout the river corridor and in upland areas via existing roads and trails. In  
11 addition, recreational use is likely to increase resulting from population growth in Chaffee  
12 County, the Front Range, and Colorado. Motorized and non-motorized recreation access and use  
13 has and may continue to stress ecological integrity including trampling of vegetation, increased  
14 physical disturbances along riparian corridors (introduction of non-native species, stream bank  
15 alteration, stream channel alteration, loss of stream bank vegetation, and overall water quality  
16 degradation), wood cutting and collection for campfires, transport of noxious plant  
17 species, human waste and trash, increase of human caused fire, wildlife displacement, human-  
18 wildlife conflicts, habitat degradation, proliferation of non-system trails, etc.

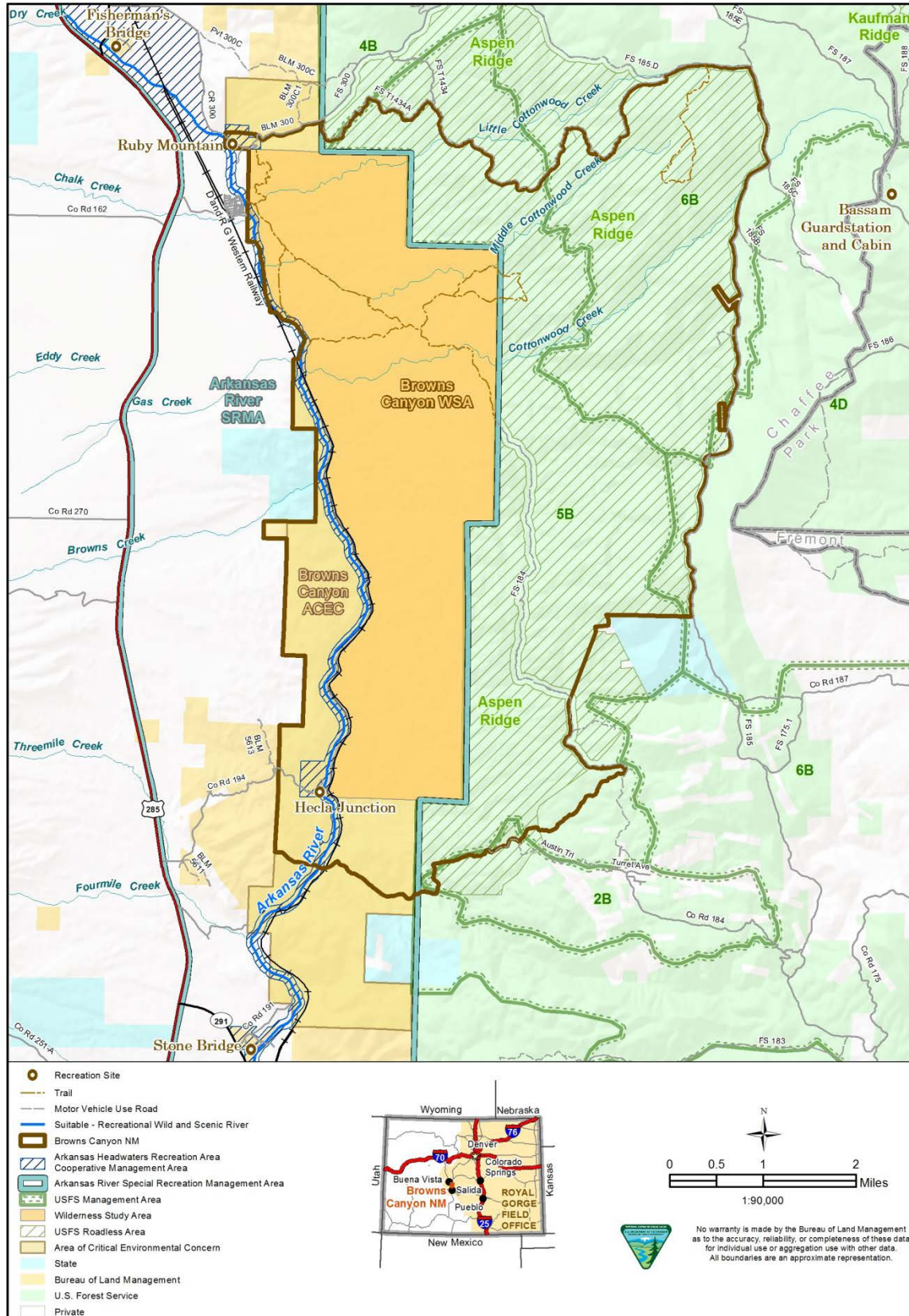
## 19 **1.6 Overview of Existing Management Direction**

20 Figure 1-2 presents the geographic specific existing management direction and designations of  
21 BLM and USFS for BCNM. Table 1-2 presents existing guidance relevant to many ROVs,  
22 organized by the following:

- 23 • Federal Instruction Memoranda, Information Bulletins, Manuals, Handbooks, and  
24 Directives
- 25 • Federal Laws, Orders, and Regulations
- 26 • Federal Land Use Plans, Implementation Plans, and NEPA Documents
- 27 • Memoranda and Agreements
- 28 • Applicable Colorado State Laws and Regulations
- 29 • State Agency Plans
- 30 • City and County Plans
- 31 • Other Applicable Guidance

32 These documents in Table 1-2 serve as the existing management direction for ROVs. Additional  
33 documents specific to single resources can be found in each resource section in Chapter 2.0 as  
34 well as Section 3.0.





1  
2 **Figure 1-2 Existing Management Direction**

Table 1-2 Existing Management Direction for Resource, Objects and Values

Agency / Document Number	Document Name	Resources and Resource Uses																		
		Air Quality and Climate	Geological Resources and Paleontological	Soils and Watersheds	Water Resources	Terrestrial Vegetation	Wildland Fire Ecology	Wetlands and Riparian Resources	Aquatic Wildlife	Terrestrial and Avian Wildlife	Special Status Species	Cultural Resources	Tribal Concerns	Visual Resources	Lands with Wilderness Characteristics	Recreation and SRMA	Travel and Transportation Management	Range and Livestock Grazing	Rights-of-Way and Land Use Authorizations	Special Designations
<b>Federal Instruction Memoranda, Information Bulletins, Manuals, Handbooks, and Directives</b>																				
BLM Handbook 1601-1	Land Use Planning Handbook	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BLM Handbook 1790-1	National Environmental Policy Act	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BLM Handbook 2100-1	Acquisition													X	X	X	X	X	X	
BLM Manual Handbook H-3042-1	Solid Minerals Reclamation Handbook		X																	
BLM Handbook 3809-1	Surface Management Handbook	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BLM Handbook 4180-1	Rangeland Health Standards			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BLM Handbook 6330	WSA Management	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BLM Handbook 8400	Visual Resource Management	X			X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
BLM Handbook H-8410-1	Visual Resource Inventory	X			X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
BLM Manual 4180	Land Health			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BLM Manual 6620	National Monuments, National Conservation Areas, and Similar Designations	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BLM Manual 8340	Off-Road Vehicles	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BLM Technical Note 346	Erosion Condition Classification System (Clark 1980)			X			X	X					X	X						
BLM Technical Note 369	Considerations in Rangeland Watershed Monitoring (Jackson, Gebhardt, and Hudson 1985)			X		X				X	X	X						X		
BLM Technical Note 405	A Framework for Analyzing the Hydrologic Conditions of Watersheds (McCammon, Rector, and Gebhardt 1998)			X	X					X	X	X					X	X		
USDA Handbook 296	Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin			X	X	X		X	X	X	X									
USFS Handbook 1909.12	Land Management Planning Handbook	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USFS Handbook 1909.15	National Environmental Policy Act Handbook	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USFS Handbook 2209.13	Grazing Permit Administration Handbook			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USFS Handbook 2509.13	Burned-Area Emergency Rehabilitation Handbook			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USFS Handbook 2509.16	Water Resource Inventory Handbook			X	X			X	X	X	X				X					
USFS Handbook 2509.18	Soil Management Handbook			X		X		X	X	X	X	X					X	X		
USFS Handbook 2509.21	National Forest System Water Rights Handbook			X	X			X	X	X	X				X		X	X		
USFS Handbook 2509.22	Soil and Water Conservation Handbook			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USFS Handbook 2509.23	Riparian Area Handbook			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USFS Handbook 2509.24	National Forest System Watershed Codes Handbook			X	X			X	X	X	X			X	X	X				
USFS Handbook 2509.25	Watershed Conservation Practices Handbook			X	X			X	X	X	X			X	X	X				
USFS Manual 2080	Noxious Weed Management			X	X	X	X	X	X	X	X			X	X	X	X	X	X	X
USFS Manual 2500	Watershed and Air Management	X		X	X	X		X					X			X	X			
USFS Manual 2600-2013-1	Conservation strategies for sensitive species and habitats			X	X	X	X	X	X	X	X			X	X	X	X	X	X	X
USFS Manual 2670	Threatened, Endangered, and Sensitive Plants and Animals			X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X
USFS Manual 5100	Fire Management, including Region 2 Regional Issuances and Pike/San Isabel Issuances	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

**Table 1-2 Existing Management Direction for Resource, Objects and Values**

Agency / Document Number	Document Name	Resources and Resource Uses																		
		Air Quality and Climate	Geological Resources and Paleontological	Soils and Watersheds	Water Resources	Terrestrial Vegetation	Wildland Fire Ecology	Wetlands and Riparian Resources	Aquatic Wildlife	Terrestrial and Avian Wildlife	Special Status Species	Cultural Resources	Tribal Concerns	Visual Resources	Lands with Wilderness Characteristics	Recreation and SRMA	Travel and Transportation Management	Range and Livestock Grazing	Rights-of-Way and Land Use Authorizations	Special Designations
<b>Federal Laws, Orders, and Regulations</b>																				
Proclamation 9232	Proclamation 9232- Establishment of the Browns Canyon National Monument	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IB WO-2003-093	Implementation of Executive Order (EO) 13287 and Preserve America Initiative	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Executive Order 11288	Prevention, Control, and Abatement of Water Pollution by Federal Activities			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Executive Order 11644	Use of Off-Road Vehicles on the Public Lands	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Executive Order 11738	Providing for Administration of the Clean Air Act and the Federal Water Pollution Control Act with Respect to Federal Contracts, Grants and Loans	X		X	X	X	X	X	X	X	X	X	X	X					X	X
Executive Order 11990	Protection of Wetlands			X	X	X	X	X	X	X	X			X	X	X	X	X	X	X
Executive Order 12548	Grazing Fees, 1986				X	X		X	X	X	X							X	X	
Executive Order 13112	Invasive Species					X				X								X		
Executive Order 13287	Preserve America		X								X	X			X					X
7 U.S.C. 2814	Federal Noxious Weed Act of 1974, as amended			X		X	X	X	X	X	X			X	X	X	X	X	X	X
16 U.S.C. 528	The Multiple Use Sustained Yield Act of 1960	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16 U.S.C. 668 et seq.	Bald and Golden Eagle Protection Act of 1940					X	X	X	X	X	X									
16 U.S.C. 703-712, omitting 709	Migratory Bird Treaty Act of 1918	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16 U.S.C. 1271 et sequens	Wild and Scenic Rivers Act, as amended			X	X	X	X	X	X	X	X			X	X	X	X	X	X	X
16 U.S.C. 1536 or 16 U.S.C. 1531, et sequens	Endangered Species Act	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16 U.S.C. 1601	Forest and Rangeland Renewable Resources Planning Act of 1974 as amended by the National Forest Management Act of 1976	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16 U.S.C. 2001	Soil and Water Resources Conservation Act of 1977			X	X	X	X	X	X	X	X			X	X	X	X	X	X	X
30 U.S.C. 22 et seq. 1872	General Mining Law of 1872		X																	
30 U.S.C. 181 et sequens	Mining and Mineral Policy Act of 1970	X	X	X	X	X		X	X	X	X	X	X	X	X	X			X	X
30 U.S.C. 611-614	The Multiple Surface Use Act of 1955		X																	
42 U.S.C. 4321 et sequens	National Environmental Policy Act of 1969	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
43 U.S.C. 315	Taylor Grazing Act of 1934				X	X		X	X	X	X			X	X	X	X	X	X	X
43 U.S.C. 869 et sequens	Public Rangelands Improvement Act of 1978			X	X	X	X	X	X	X	X			X	X	X	X	X	X	X
43 U.S.C. 1701 et sequens	Federal Land Policy Management Act of 1976	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
36 CFR 219	USFS 2012 Planning Rule	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
36 CFR 222	Range Management			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
36 CFR 228, Subpart A	Regulations for Recreational Mineral Collection on USFS-administered Land		X																	
36 CFR Part 294, 77 Fed. Reg. 39576	USFS 2012 Roadless Area Conservation Final Rule			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
40 CFR 50.4-50.12	National Ambient Air Quality Standards	X											X	X	X	X	X		X	X
43 CFR 2400, Pub. L. No. 88-607, 78 Stat. 986 (1964) (expired 1970). 77 43 U.S.C. 1702(c). 78 Id. 1702(h)	Classification of Multiple Use Act of September 1964	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Table 1-2 Existing Management Direction for Resource, Objects and Values

Agency / Document Number	Document Name	Resources and Resource Uses																	
		Air Quality and Climate	Geological Resources and Paleontological	Soils and Watersheds	Water Resources	Terrestrial Vegetation	Wildland Fire Ecology	Wetlands and Riparian Resources	Aquatic Wildlife	Terrestrial and Avian Wildlife	Special Status Species	Cultural Resources	Tribal Concerns	Visual Resources	Lands with Wilderness Characteristics	Recreation and SRMA	Travel and Transportation Management	Range and Livestock Grazing	Rights-of-Way and Land Use Authorizations
43 CFR 3715, 3802, and 3809	provisions for mining activities in WSAs		X																
P.L. 94-588	National Forest Management Act of 1976	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IM 78-523	Compliance with Bureau of Land Management Interim Floodplain Management Procedures			X	X	X	X	X	X	X	X				X	X			
	Clean Air Act	X					X		X	X		X	X	X	X	X		X	X
	Clean Water Act of 1972			X	X	X	X	X	X	X			X	X	X	X	X	X	X
	Colorado River Basin Salinity Control Act of 1974			X	X	X	X	X	X	X		X		X	X	X	X	X	X
USDA 1988	Departmental Regulation Number 9500-5 Environmental Compliance Policy on Range			X	X	X	X	X	X	X		X	X	X	X	X	X	X	X
USDA NRCS 1981	Farmland Protection Policy Act of 1981			X	X	X	X	X	X	X		X				X	X	X	
	Granger-Thye Act of 1950			X	X	X	X	X	X	X		X	X	X	X	X	X	X	
	Healthy Forests Restoration Act of 2003	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Public Law 95-514	Public Rangelands Improvement Act of 1978			X	X	X	X	X	X	X			X		X	X	X	X	
USEPA 1974	Safe Drinking Water Act			X	X	X	X	X	X	X				X	X	X	X	X	
USFS 1995	The Rescissions Act of 1995 (Public Law 104-19)			X	X	X	X	X	X	X				X	X	X	X	X	
H.R. 10203	Water Resources Development Act of 1974			X	X	X	X	X	X	X			X	X	X	X	X	X	X
<b>Federal Land Use Plans, Implementation Plans, and NEPA Documents</b>																			
BLM, USFS, CPW 2018	Arkansas Headwaters Recreation Area Management Plan / Environmental Assessment	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USDA and DOI 2009	Guidance for Implementation of Federal Wildland Fire Management Policy	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USDA and DOI 2008	Interagency Prescribed Fire Planning and Implementation Procedures Guide	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USDA and DOI 2002	A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year Comprehensive Strategy Implementation Plan	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USDA 2000	Protecting People and Sustaining Resources in Fire-Adapted Ecosystems: A Cohesive Strategy	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BLM 1996	Royal Gorge Resource Area RMP/ROD	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BLM 2008	Arkansas River TMP	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BLM 1997	Amendment to Land Health Standards	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USFS 1984	Pike and San Isabel National Forest LRMP	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BLM 2016	Record of Decision. Vegetation Treatments Using Aminopyralid, Fluroxypyr, and Rimsulfuron on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement. DOI-BLM-WO-WO2100-2012-0002-EIS			X	X	X	X	X	X	X	X			X	X	X	X	X	X
BLM 2015	Eastern Colorado Analysis Management Situation (AMS)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BLM 2007	Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement. FES 07-21			X	X	X	X	X	X	X	X			X	X	X	X	X	X
BLM 2001	BLM Standards for Public Land Health and			X	X	X	X	X	X	X	X			X	X	X	X	X	X

**Table 1-2 Existing Management Direction for Resource, Objects and Values**

Agency / Document Number	Document Name	Resources and Resource Uses																		
		Air Quality and Climate	Geological Resources and Paleontological	Soils and Watersheds	Water Resources	Terrestrial Vegetation	Wildland Fire Ecology	Wetlands and Riparian Resources	Aquatic Wildlife	Terrestrial and Avian Wildlife	Special Status Species	Cultural Resources	Tribal Concerns	Visual Resources	Lands with Wilderness Characteristics	Recreation and SRMA	Travel and Transportation Management	Range and Livestock Grazing	Rights-of-Way and Land Use Authorizations	Special Designations
	Guidelines for Livestock Grazing Management																			
BLM 1997	Colorado Public Land Health Standards: Decision Record & Finding of No Significant Impact and Environmental Assessment for Standards for Public Land Health and Guidelines for Livestock Grazing Management			X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	
BLM, USFS, DOE, DOD, DOC, USEPA, FEMA, National Association of State Foresters 2001	Review and Update of the 1995 Federal Wildland Fire Management Policy	X		X	X	X	X	X	X	X	X			X	X	X	X	X	X	
<b>Memoranda and Agreements</b>																				
60F26045-48 (May 1995)	Interagency Memorandum of Understanding (MOU) between the BLM and U.S. Department of Agriculture	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	Interagency Memorandum of Understanding (MOU) between the BLM and USFWS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
<b>Applicable Colorado State Laws and Regulations</b>																				
	Colorado OHV Act	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
2 C.C.R. 405-5 Chapter P-5	Colorado OHV regulations	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
5 C.C.R. 1001-11	Colorado Air Quality Control Commission, Regulation Number 9, Open Burning, Prescribed Fire, and Permitting	X		X	X	X	X	X	X	X	X					X	X			
5 C.C.R. 1002-93, Regulation #93, Colorado Section 303(d)	Colorado Department of Public Health and Environment, Water Quality Commission, List of Impaired Waters and Monitoring and Evaluation List			X	X	X		X	X	X						X	X			
5 C.C.R. 1003-1 (amended January 2005)	Colorado Primary Drinking Water Regulations			X	X			X							X		X			
8 C.C.R. 1203-15 or C.R.S 35-5.5	Colorado Noxious Weeds Act			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
C.R.S. Title 37, Article 90, Sections 37-90-107, 108, 109, 111, C.R.S.	Colorado Ground Water Management Act				X															
CDPHE 2017	Colorado Water Quality Control Act			X	X	X		X	X	X	X									
CDPHE Water Quality Commission Regulation No. 39	Colorado River Salinity Standards (adopted May 1980; amended 1982 and 1997)			X																
State of Colorado Ground Water Commission	Rules and Regulations for the Management and Control of Designated Groundwater. Re-amendment			X	X	X		X	X	X	X			X	X		X			
	Colorado Recreation Trails Act																			
Colorado Division of Water Resources	Colorado Prior Appropriation Doctrine			X	X			X	X	X	X			X	X	X	X	X	X	
Colorado General Assembly 1969	Colorado Water Rights Determination and Administration Act			X	X			X	X	X	X			X	X	X	X	X	X	
Water Quality Control Commission Regulation No. 31	The Basic Standards and Methodologies for Surface Water (amended August 2005)			X	X			X	X	X	X			X	X	X	X	X	X	
Water Quality Control Commission Regulation No. 41	The Basic Standards for Groundwater			X	X			X	X	X	X			X	X	X	X	X	X	
Water Quality Control Commission	Site-Specific Water Quality Classifications and			X	X			X	X	X	X			X	X	X	X	X	X	

**Table 1-2 Existing Management Direction for Resource, Objects and Values**

Agency / Document Number	Document Name	Resources and Resource Uses																	
		Air Quality and Climate	Geological Resources and Paleontological	Soils and Watersheds	Water Resources	Terrestrial Vegetation	Wildland Fire Ecology	Wetlands and Riparian Resources	Aquatic Wildlife	Terrestrial and Avian Wildlife	Special Status Species	Cultural Resources	Tribal Concerns	Visual Resources	Lands with Wilderness Characteristics	Recreation and SRMA	Travel and Transportation Management	Range and Livestock Grazing	Rights-of-Way and Land Use Authorizations
Regulation No. 42	Standards for Groundwater																		
Water Quality Control Commission Regulation No. 93 – Section 303(d)	List Water Quality Limited Segments Requiring TMDLs			X	X			X	X	X	X			X	X	X	X	X	X
Arkansas Basin Roundtable, 2017	Upper Arkansas Voluntary Flow Management Program			X	X			X	X	X	X			X	X	X	X	X	X
Arkansas River Compact Administration 1949	Kansas-Colorado Arkansas River Compact			X	X			X	X	X	X			X	X	X	X	X	X
Colorado Department of Public Health and Environment 2010	Colorado's Section 303(D) List of Impaired Waters and Monitoring and Evaluation List																		
<b>State Agency Plans</b>																			
Colorado Water Conservation Board 2015	Colorado Water Plan			X	X	X	X	X	X	X	X				X		X	X	
Colorado Water Conservation Board 2010	Statewide Water Supply Initiative			X	X			X					X		X		X		
CDPHE Water Quality Control Division 2016	Integrated Water Quality Monitoring and Assessment Report			X	X		X	X	X	X	X			X	X	X	X	X	X
Colorado Water Quality Control Commission 2011	Statewide Water Quality Management Plan			X	X		X	X	X	X	X			X	X	X	X	X	X
Colorado Water Quality Control Commission 2012	Colorado Nonpoint Source Program. Management Plan			X	X		X	X	X	X	X			X	X	X	X	X	X
CPW 2017	Big Game Herd Management (DAU) Plans					X	X	X		X					X	X	X	X	X
CPW 2015	Colorado State Wildlife Action Plan			X	X	X	X	X	X	X	X				X	X	X		
CPW 2014	Colorado Statewide Comprehensive Outdoor Recreation Plan			X	X					X	X	X		X	X	X		X	X
<b>City and County Plans</b>																			
Chaffee County 2003	Chaffee County Trails Master Plan(s)			X	X	X	X	X	X	X	X			X	X	X	X	X	X
Chaffee County 2010	Chaffee County Comprehensive Plan																		
Chaffee County 2014	Land Use Code: Right to Farm and Ranch				X	X		X	X	X	X					X	X	X	

1

### 1 **1.6.1.1 BLM Existing Management Direction**

2 BLM management guidance for the Royal Gorge Field Office is contained in the RGRMP  
3 specific to Eco-Subregion 1 (Arkansas River) as described below. Additional resource-specific  
4 management direction from RGRMP is found in Chapter 2.0.

### 5 **BLM Arkansas River Eco-Subregion 1**

#### 6 Wilderness Management

7 Browns Canyon WSA is recommended by BLM for wilderness designation in the Final Cañon  
8 City District Wilderness EIS dated December 1987, and will be managed in accordance with  
9 congressional directive and BLM Interim Management Policy and Guidelines for Lands Under  
10 Wilderness Review until Congress makes a decision on wilderness recommendations for the  
11 Canon City District. If the WSA is not designated as wilderness and is released by Congress  
12 from further study, it will return to other types of multiple use management as prescribed in this  
13 land use plan. In accordance with Sec. 603 of FLPMA, BLM is required to manage all identified  
14 wilderness study areas under the non-impairment mandate. Grazing uses and mining operations  
15 occurring as of October 21, 1976, may continue in the same manner and degree as long as they  
16 do not cause unnecessary or undue degradation. Use and operations proposed after this date,  
17 however, are subject to the non-impairment requirements for all operation proposed.

#### 18 Water Quality

19 The Arkansas River Initiative, a group currently headed by the USEPA, is working to  
20 consolidate previous studies, coordinate and standardize current studies, and provide a method to  
21 share the information obtained. Additional data collection is also anticipated.

22 The Arkansas River Watershed Collaborative (ARWC) was formed by the Watershed Health  
23 Sub-Committee of the Arkansas Basin Roundtable. ARWC is currently developing grant funding  
24 to complete a scope of work that includes: Collaborative Development, Data Review and  
25 Mapping and Sharing, Strategic Watershed Health Plan Development, Public Outreach and  
26 Education, and Watershed Health Projects.

#### 27 Arkansas River SRMA

28 Management for this SRMA will provide upland recreational opportunities that complement the  
29 water-based opportunities in semiprimitive, rural, semiprimitive motorized, and nonmotorized  
30 settings (i.e., watchable wildlife, natural resource interpretation, hiking, biking, and OHV use).  
31 Additional recreation and public purpose (R&PP) leases within the CMA area will be issued if  
32 the following criteria are met: 1) The site should be programmed for capital investment including  
33 permanent facilities and services for the benefit of the public; 2) Proposals for use of a site  
34 should satisfy an identified need; 3) Proposals for use of a site should accomplish the  
35 management objectives outlined in the AHRA-MP for that location; 4) The site should be of

1 minimum acreage needed to accomplish what is proposed; 5) Proposals for use of a site should  
2 alleviate existing environmental impacts and prevent future impacts; 6) Proposals for use and  
3 development of a site should be suitable for the selected location; and 7) The proposal must meet  
4 the requirements of the R&PP Act. All decisions in the existing AHRA-MP and decision record  
5 will be carried forward in this plan. Semi-primitive non-motorized settings in the Browns  
6 Canyon WSA will be maintained.

7 Potential National Recreation Area

8 River recreation values within the Arkansas River Corridor will continue to be managed jointly  
9 by the CPW and BLM as detailed in the AHRA-MP. This joint management will continue  
10 whether or not the river corridor is designated a national recreation area (NRA) by Congress. The  
11 NRA proposal will include the Arkansas River and adjacent public lands in the Cañon City  
12 District, Royal Gorge Resource Area and comprises approximately 125,000 acres. It is assumed  
13 that whether or not management as a special recreation management area (SRMA) continues or  
14 management is under a congressional designation of NRA, recreational values in the river  
15 corridor will continue to be enhanced for public use. It is also assumed that a potential NRA  
16 designation will include the same approximate area and the same recreation values currently  
17 managed within the SRMA.

18 **1.6.1.2 USFS Existing Management Direction**

19 The PSICC LRMP establishes forest-wide management direction and associated long-range  
20 goals and objectives; specifies standards and guidelines; establishes monitoring and evaluation  
21 requirements; and makes determinations on the suitability for wilderness designation. Five  
22 LRMP geographic management areas with unique emphases are partially contained within  
23 BCNM as shown in Figure 1-2. General Direction and goals from these five management areas  
24 are described below. Additional resource-specific management direction from the LRMP is  
25 found in Chapter 2.0.

26 **USFS Management Area 2B Prescription Summary: Rural and Roded-Natural**  
27 **Recreation Opportunities**

28 Management emphasis is for rural and roded-natural recreation opportunities. Motorized and  
29 non-motorized recreation activities such as driving for pleasure, viewing scenery, picnicking,  
30 fishing, snowmobiling, and cross-country skiing are possible. Conventional use of highway-type  
31 vehicles is provided for in design and construction of facilities. Motorized travel may be  
32 prohibited or restricted to designated routes, to protect physical and biological resources.

33 Visual resources are managed so that management activities maintain or improve the quality of  
34 recreation opportunities. Management activities are not evident, remain visually subordinate, or  
35 may dominate, but harmonize and blend with the natural setting. Landscape rehabilitation is used



1 to restore landscapes to a desirable visual quality. Enhancement aimed at increasing positive  
2 elements of the landscape to improve visual variety is also used.

3 The harvest method by forest cover type is clearcutting in aspen and lodgepole pine, shelterwood  
4 in interior ponderosa pine, mixed conifer and Englemann spruce-subalpine fir.

5 The mineral and energy resources activities are compatible with goals of this management area  
6 subject to appropriate stipulations as outlined in the general Forest Direction.

7 **Management Area 4B Prescription Summary: Wildlife Habitat for Management Indicator**  
8 **Species**

9 Management emphasis is on the habitat needs of one or more management indicator species.  
10 Species with compatible habitat needs are selected for an area. The goal is to optimize habitat  
11 capability, and thus numbers of the species. The prescription can be applied to emphasize groups  
12 of species, such as early succession dependent of late succession dependent, in order to increase  
13 species richness or diversity.

14 Vegetation characteristics and human activities are managed to provide optimum habitat for the  
15 selected species, or to meet population goals jointly agreed to with the State Fish and Wildlife  
16 agencies. Tree stands are managed for specific size, shape, interspersion, crown closure, age,  
17 structure, and edge contrast. Grass, forb, and browse vegetation characteristics are regulated.  
18 Rangeland vegetation is managed to provide needed vegetation species composition and  
19 interspersed grass, forb, and shrub sites or variety in age of browse plants.

20 Recreation and other human activities are regulated to favor the needs of the designated species.  
21 Roaded-natural recreation opportunities are provided along Forest arterial and collector roads.  
22 Local roads and trails are either open or closed to public motorized travel. Semi-primitive  
23 motorized recreation opportunities are provided on those local roads and trails that remain open,  
24 semi-primitive non-motorized opportunities are provided on those that are closed. A full range of  
25 tree harvest investments in other compatible resource uses may occur but will be secondary to  
26 habitat requirements. Management activities may dominate in foreground and middleground, but  
27 harmonize and blend with the natural setting.

28 The mineral and energy resources activities are compatible with goals of this management area  
29 subject to appropriate stipulations as outlined in the general Forest Direction.

30 **Management Area 4D Prescription Summary: Aspen Management**

31 Management emphasis is on maintaining and improving aspen sites. Other tree species, if  
32 present, are de-emphasized. Aspen is managed to produce wildlife habitat, wood products, visual  
33 quality, and plant and animal diversity. Aspen clones are maintained. On larger areas, a variety  
34 of aspen stand ages, sizes, shapes, and interspersion are maintained. Both commercial and non-  
35 commercial treatments are applied. Even-aged management is practiced and is achieved by  
36 clearcutting. Diversity objectives are achieved by varying the size, age, shape, and interspersion

1 of individual stands. Management activities in foreground and middleground are dominant, but  
2 harmonize and blend with the natural setting. Individual treatments generally are smaller than 40  
3 acres.

4 Recreational opportunities available are semi-primitive non-motorized and motorized or roaded  
5 natural. Some temporary or seasonal road and area use restrictions are implemented to prevent  
6 disturbance of wildlife or improve hunting and fishing quality.

7 **Management Area 5B Prescription Summary: Big Game Winter Range**

8 Management emphasis is on forage and cover on winter ranges. Winter habitat for deer, elk,  
9 bighorn sheep, and mountain goats is emphasized. Treatments to increase forage production or to  
10 create and maintain thermal and hiding cover for big game are applied. Tree stand treatments can  
11 be clearcut, shelterwood, single tree selection, or group selection. Commercial and non-  
12 commercial stand treatments occur. Specific cover-opening ratios, and stand designs are  
13 maintained. Treatments to grass, forb, browse, and non-commercial tree species include seeding,  
14 planting, spraying, burning, falling, and mechanical chopping or crushing. A variety of browse  
15 age classes are maintained. Continuous forest cover is maintained on some sites.

16 Investments in compatible resources occur. Livestock grazing is compatible but is managed to  
17 favor wildlife habitat. Structural range improvements benefit wildlife. Management activities are  
18 not evident, remain visually subordinate, or dominate in the foreground and middleground but  
19 harmonize and blend with the natural setting.

20 New roads other than short-term temporary roads are located outside of the management area.  
21 Short-term roads are obliterated within one season after intended use. Existing local roads are  
22 closed and new motorized recreation use is managed to prevent unacceptable stress on big game  
23 animals during the primary big game use season.

24 The mineral and energy resources activities are compatible with goals of this management area  
25 subject to appropriate stipulations as outlined in the general Forest Direction.

26 **Management Area 6B Prescription Summary: Livestock Grazing**

27 The area is managed for livestock grazing. Range condition is currently at or above the  
28 satisfactory level. Intensive grazing management systems are favored over extensive systems.  
29 Range condition is maintained through use of forage improvement practices, livestock  
30 management, and regulation of other resource activities. Periodic heavy forage utilization occurs.  
31 Investment in structural and non-structural range improvements to increase forage utilization is  
32 moderate to high. Structural improvements benefit, or at least do not adversely affect wildlife.  
33 Conflicts between livestock and wildlife are resolved in favor of livestock. Non-structural  
34 restoration and forage improvement practices available are seeding, planting, burning, fertilizing,  
35 pitting, furrowing, spraying, crushing, and plowing. Cutting of encroaching trees may also occur.

- 1 Investments are made in compatible resource activities. Dispersed recreational opportunities vary
- 2 between semi-primitive non-motorized and roaded natural. Management activities are evident
- 3 but harmonize and blend with the natural setting.
- 4 The mineral and energy resources activities are compatible with goals of this management area
- 5 subject to appropriate stipulations as outlined in the general Forest Direction.

1 **2.0 ECOSYSTEMS, RESOURCES, CONDITIONS,**  
2 **AND TRENDS**

3 **2.1 Resources**

4 **2.1.1 Air Quality**

5 Federal, State and local air quality regulations and standards govern the management of air  
6 quality within, and in areas directly adjacent to, BCNM. Air pollutants are emitted from various  
7 sources, including industry, commercial development, building heating and cooling, and  
8 transportation. Sources of emissions within BCNM are relatively few and small, consisting  
9 mostly of visitors' motor vehicles traveling on internal roads and trails, and a few buildings that  
10 support operations and maintenance. To the extent that visitation may increase in the future,  
11 emissions from motor vehicle use within BCNM would also increase. Most air quality effects on  
12 the BCNM likely are due to sources in the region surrounding BCNM. Emissions generally have  
13 increased over time as development has occurred in the region, but these increases are moderated  
14 by increasingly stringent regulations that have decreased the emission rates from individual  
15 sources. The Proclamation identifies BCNM as an important area for studies on the effects of  
16 climate change.

17 Planning issues and management concerns based on Proclamation 9232 and additional agency  
18 concerns include:

- 19 • What level of seasonal or other air quality resource value (AQRV) degradation to Browns  
20 Canyon WSA triggers BLM and USFS response?
- 21 • How can monument visibility, visual resources (contrast, color, foreground, background),  
22 scenery degradation risk be mitigated to address degraded social amenity value to BCNM  
23 use and enjoyment?
- 24 • Can Browns Canyon Monument and WSA be added into the next iteration of the  
25 Colorado Air Management Modeling Study (CARMMS) as a separate "Sensitive Class II  
26 area" for analyzing AQRV impacts (primarily visibility)?
- 27 • Can the current CARMMS 2.0 gridded modeled results for each of the CARMMS three  
28 future year 2025 scenarios be processed at the 4 kilometer grid cell level to describe  
29 potential air quality impacts for grid cells intersecting the Monument and WSA?
- 30 • Does the BLM Colorado Annual Report have enough Affected Environment, Cumulative  
31 and GHG and Climate Change (from an Air Resource perspective) information to pretty  
32 much cover these sections for a full Air Resource assessment (EIS, EA, etc.)?
- 33 • CARMMS and other Tools can be used to describe where emissions for these impacts are  
34 coming from, and so, is there some sort of communication platform for BLM Colorado

1 leadership that could work to develop a strategy to control emissions in other Field  
2 Offices that cause poor visibility in the Monument / WSA?

3 **2.1.1.1 Assessment Area**

4 The geographic area considered for characterizing conditions and trends of the monument air  
5 quality and climate change will be the BCNM boundary as well as the surrounding areas which  
6 include but are not limited to AHRA and San Isabel National Forest. In addition, the Harriett  
7 Alexander Field Airport in Salida, Colorado has been identified as a potential source of  
8 emissions affecting air quality in the BCNM boundary.

9 **2.1.1.2 Best Available Scientific Information**

10 BLM. 2015. Colorado Air Resources Protection Protocol, 2015 Annual Report. Available online  
11 at: <https://www.co.blm.gov/nepa/airreports/AR2015.html>. December 8, 2017.

12 BLM. 2017. Social Vulnerability Assessment Summary of Findings – Review of BLM  
13 Documents and Plans. Available online at:  
14 [http://nccsc.colostate.edu/sites/default/files/projects/BLM-Document-Review\\_Fact-](http://nccsc.colostate.edu/sites/default/files/projects/BLM-Document-Review_Fact-Sheet_COBLMSVA.pdf)  
15 [Sheet\\_COBLMSVA.pdf](http://nccsc.colostate.edu/sites/default/files/projects/BLM-Document-Review_Fact-Sheet_COBLMSVA.pdf). December 8, 2017.

16 BLM. 2017. Social Vulnerability Assessment Summary of Findings – Field Office Case Studies.  
17 Available online at: [http://nccsc.colostate.edu/sites/default/files/projects/Case-Studies\\_Fact-](http://nccsc.colostate.edu/sites/default/files/projects/Case-Studies_Fact-Sheet_COBLMSVA.pdf)  
18 [Sheet\\_COBLMSVA.pdf](http://nccsc.colostate.edu/sites/default/files/projects/Case-Studies_Fact-Sheet_COBLMSVA.pdf). December 8, 2017.

19 BLM. 2017. Social Vulnerability Assessment Summary of Findings – Indicators Analysis.  
20 Available online at: [http://nccsc.colostate.edu/sites/default/files/projects/Spatial-](http://nccsc.colostate.edu/sites/default/files/projects/Spatial-Indicators_Fact-Sheet_COBLMSVA.pdf)  
21 [Indicators\\_Fact-Sheet\\_COBLMSVA.pdf](http://nccsc.colostate.edu/sites/default/files/projects/Spatial-Indicators_Fact-Sheet_COBLMSVA.pdf). December 8, 2017.

22 BLM. 2017. Social Vulnerability Assessment. Final Report. Shannon McNeeley, Corrie Knapp,  
23 Trevor Even, John Gioia, and Julia Nave. Available online at:  
24 [http://nccsc.colostate.edu/sites/default/files/projects/COBLM\\_Social-Vulnerability-](http://nccsc.colostate.edu/sites/default/files/projects/COBLM_Social-Vulnerability-Assessment.pdf)  
25 [Assessment.pdf](http://nccsc.colostate.edu/sites/default/files/projects/COBLM_Social-Vulnerability-Assessment.pdf). December 8, 2017.

26 Colorado Department of Public Health and Environment (CDPHE). 2014. Colorado Greenhouse  
27 Gas Inventory—2014 Update Including Projections to 2020 & 2030. Available online:  
28 <https://www.colorado.gov/pacific/sites/default/files/AP-COGHGInventory2014Update.pdf>.  
29 December 28, 2017.

30 Colorado Department of Public Health and Environment (CDPHE). 2015. 2015 Ambient Air  
31 Monitoring Network Assessment. Available online at:  
32 [https://www.colorado.gov/airquality/tech\\_doc\\_repository.aspx?action=open&file=2015\\_CO\\_](https://www.colorado.gov/airquality/tech_doc_repository.aspx?action=open&file=2015_CO_5yr_Network_Assessment.pdf)  
33 [5yr\\_Network\\_Assessment.pdf](https://www.colorado.gov/airquality/tech_doc_repository.aspx?action=open&file=2015_CO_5yr_Network_Assessment.pdf). December 8, 2017.

- 1 Colorado Department of Public Health and Environment (CDPHE). 2017. Colorado Air Quality  
2 Data Report 2016. Available online at:  
3 [https://www.colorado.gov/airquality/tech\\_doc\\_repository.aspx?action=open&file=2016Annual](https://www.colorado.gov/airquality/tech_doc_repository.aspx?action=open&file=2016AnnualDataReport.pdf)  
4 [DataReport.pdf](https://www.colorado.gov/airquality/tech_doc_repository.aspx?action=open&file=2016AnnualDataReport.pdf). December 5, 2017.
- 5 Colorado Department of Public Health and Environment (CDPHE). Colorado Ambient  
6 Monitoring Network Plan. 2017. Available online at:  
7 [https://www.colorado.gov/airquality/tech\\_doc\\_repository.aspx?action=open&file=2017Annual](https://www.colorado.gov/airquality/tech_doc_repository.aspx?action=open&file=2017AnnualNetworkPlan.pdf)  
8 [NetworkPlan.pdf](https://www.colorado.gov/airquality/tech_doc_repository.aspx?action=open&file=2017AnnualNetworkPlan.pdf). December 8, 2017.
- 9 Colorado State University (CSU). 2017. Climate Change Vulnerability Assessment for Colorado  
10 Bureau of Land Management. Colorado Natural Heritage Program, Warner College of Natural  
11 Resources. Available online at:  
12 [http://www.cnhp.colostate.edu/download/documents/2015/CCVA\\_for\\_Colorado\\_BLM\\_final.](http://www.cnhp.colostate.edu/download/documents/2015/CCVA_for_Colorado_BLM_final.pdf)  
13 [pdf](http://www.cnhp.colostate.edu/download/documents/2015/CCVA_for_Colorado_BLM_final.pdf). December 8, 2017.
- 14 Colorado State University (CSU). 2017. Interagency Monitoring of Protected Visual  
15 Environments. Available online at: <http://vista.cira.colostate.edu/improve/>. December 5,  
16 2017.
- 17 Colorado State University (CSU). 2017. AQRV Summaries. Available online:  
18 <http://vista.cira.colostate.edu/Improve/aqrv-summaries/>. Accessed on December 22, 2017.
- 19 McNealey, Shannon M., Trevor L. Even, John B.M. Gioia, Corrine N. Knapp, and Tyler A.  
20 Beeton. 2017. Expanding vulnerability assessment for public lands: The social complement to  
21 ecological approaches. *Climate Risk Management* 16 (2017) 106–119. Available online at:  
22 [https://ac.els-cdn.com/S2212096317300153/1-s2.0-S2212096317300153-](https://ac.els-cdn.com/S2212096317300153/1-s2.0-S2212096317300153-main.pdf?_tid=750989c8-dc41-11e7-a9c0-00000aab0f01&acdnat=1512756115_466eaaad17a51d441e1df1a30b15da3a9)  
23 [main.pdf?\\_tid=750989c8-dc41-11e7-a9c0-](https://ac.els-cdn.com/S2212096317300153/1-s2.0-S2212096317300153-main.pdf?_tid=750989c8-dc41-11e7-a9c0-00000aab0f01&acdnat=1512756115_466eaaad17a51d441e1df1a30b15da3a9)  
24 [00000aab0f01&acdnat=1512756115\\_466eaaad17a51d441e1df1a30b15da3a9](https://ac.els-cdn.com/S2212096317300153/1-s2.0-S2212096317300153-main.pdf?_tid=750989c8-dc41-11e7-a9c0-00000aab0f01&acdnat=1512756115_466eaaad17a51d441e1df1a30b15da3a9). December 8,  
25 2017.
- 26 Muhlfeld, Chris, 2014, Invasive hybridization in a threatened species is accelerated by climate  
27 change, *Nature Climate Change*, 4, 620-624.
- 28 National Jewish Health. 2017. Wildfire Smoke. Available online at:  
29 [https://www.nationaljewish.org/health-insights/air-pollution-and-healthy-homes/wildfire-](https://www.nationaljewish.org/health-insights/air-pollution-and-healthy-homes/wildfire-smoke)  
30 [smoke](https://www.nationaljewish.org/health-insights/air-pollution-and-healthy-homes/wildfire-smoke). December 8, 2017.
- 31 USFS. Undated. What Are the Impacts? Available online at: [https://www.fs.fed.us/science-](https://www.fs.fed.us/science-technology/climate-change/what-are-the-impacts)  
32 [technology/climate-change/what-are-the-impacts](https://www.fs.fed.us/science-technology/climate-change/what-are-the-impacts). December 8, 2017.
- 33 USFS. 2009. Pike and San Isabel National Forests and Cimarron and Comanche National  
34 Grasslands Annual Monitoring Report for Fiscal Year 2008. Available online:  
35 [https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprdb5229248.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5229248.pdf). December 5,  
36 2017.

- 1 USFS. Undated. Climate Change Effects on Forests and Grasslands. Available online at:  
2 <https://www.fs.usda.gov/ccrc/education/climate-change-effects-forests-and-grasslands>.  
3 December 8, 2017.
- 4 U.S. Environmental Protection Agency (EPA). 2016. Wildfire Smoke: a guide for Public Health  
5 Officials. Available online at: [https://www3.epa.gov/airnow/wildfire\\_may2016.pdf](https://www3.epa.gov/airnow/wildfire_may2016.pdf).  
6 December 8, 2017.
- 7 U.S. Environmental Protection Agency (EPA). 2017a. 2014 National Emissions Inventory (NEI)  
8 Data. Available online: [https://www.epa.gov/air-emissions-inventories/2014-national-](https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data)  
9 [emissions-inventory-nei-data](https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data). Accessed on December 20, 2017.
- 10 U.S. Environmental Protection Agency (EPA). 2017b. Clean Air Status and Trends Network  
11 (CASTNET). Site Information. Available online:  
12 [https://www3.epa.gov/castnet/site\\_pages/PET427.html](https://www3.epa.gov/castnet/site_pages/PET427.html). December 22, 2017.
- 13 U.S. General Accounting Office (GAO). 1993. Federal Land Management Status and Uses of  
14 Wilderness Study Areas. September 23. Available online at:  
15 <http://www.gao.gov/assets/220/218719.pdf>. October 18, 2017.
- 16 Western Regional Climate Center. 2016. Climate of Colorado. Available online at:  
17 [https://wrcc.dri.edu/Climate/narrative\\_co.php](https://wrcc.dri.edu/Climate/narrative_co.php). December 8, 2017.

## 18 **GIS Data**

- 19 • EPA Carbon Monoxide, CO\_1971std\_naa.shp. Available:  
20 [https://www3.epa.gov/airquality/greenbook/gis\\_download.html](https://www3.epa.gov/airquality/greenbook/gis_download.html). Accessed: August 31,  
21 2016.
- 22 • EPA Particulate Matter, PM10\_1987std\_naa.shp. Available:  
23 [https://www3.epa.gov/airquality/greenbook/gis\\_download.html](https://www3.epa.gov/airquality/greenbook/gis_download.html). Accessed: August 31,  
24 2016.
- 25 • EPA 8 Hour Ozone, Ozone\_8hr\_2008std\_naa.shp. Available:  
26 [http://www.epa.gov/airquality/greenbook/gis\\_download.html](http://www.epa.gov/airquality/greenbook/gis_download.html). Accessed: June 19, 2015.
- 27 • USFS Air Resource Management Program., Class\_I\_II\_Areas. Accessed August, 17  
28 2015.
- 29 • NPS Boundary, nps\_boundary.shp. Available:  
30 <https://irma.nps.gov/DataStore/Reference/Profile/2224545?Inv=True>. Accessed:  
31 September 9, 2016.
- 32 • USFWS FWSInterest, Available: <https://www.fws.gov/gis/data/national/>. Accessed:  
33 February 1, 2017.

1 **2.1.1.3 Limitations/Data Gaps**

2 There are no existing air quality monitoring stations in BCNM, and there are no inventories of  
3 emissions from activities occurring within the monument boundary. This planning assessment  
4 relies on county and regional air data to make inferences concerning air quality and emissions in  
5 BCNM.

6 Insufficient data exists with BCNM to discuss current landscape resiliency and response to  
7 climate change. Several new studies indicate there are species modifications underway. In the  
8 journal *Nature Climate Change*, (Muhlfeld 2014), connected warmer temperatures and decreased  
9 precipitation to accelerated hybridization of rainbow trout and the Northern Rocky’s Westslope  
10 cutthroat trout. Scientists have theorized this for years but this was the first time research results  
11 provided documentation.

12 **2.1.1.4 Existing Conditions and Trends**

13 The Clean Air Act (CAA) of 1970 as amended (42 United States Code [U.S.C.] Chapter 85  
14 §§7401 et seq.) is the comprehensive federal law that provides for regulation of air emissions  
15 from stationary and mobile sources, establishment of national ambient air quality standards  
16 (NAAQS) to protect public health and public welfare, and protection of visibility in relatively  
17 pristine areas such as national parks and wilderness areas. The CAA prescribes the measures that  
18 the U.S. Environmental Protection Agency (EPA) and other federal agencies and state, local, and  
19 tribal governments must take in order to regulate air pollution and achieve air quality that meets  
20 the NAAQS.

21 To protect human health and welfare, the CAA requires EPA to establish NAAQS for pollutants  
22 harmful to public health or the environment. The EPA has set NAAQS (codified at 40 Code of  
23 Federal Regulations [CFR] 50) for the following “criteria” pollutants: carbon monoxide (CO),  
24 lead (Pb), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), particulate matter of 10 microns diameter or less  
25 (PM<sub>10</sub>) and 2.5 microns diameter or less (PM<sub>2.5</sub>), and sulfur dioxide (SO<sub>2</sub>). Primary standards are  
26 set to protect human health with an adequate margin of safety. Secondary standards are set to  
27 protect public welfare and may account for Air Quality Related Values (AQRVs) and protection  
28 of plants, animals, and materials. Air pollutant concentrations greater than the NAAQS represent  
29 a risk to human health. If the air quality in a geographic area meets the NAAQS, the area is  
30 designated as an attainment area. Areas that do not meet the NAAQS are designated  
31 nonattainment areas and must develop comprehensive State Implementation Plans to reduce  
32 pollutant concentrations to a safe level. Former nonattainment areas that have achieved  
33 attainment are designated as maintenance areas. Attainment status is determined separately by  
34 EPA for each criteria pollutant. The CDPHE has established state-specific ambient air quality  
35 standards that are similar to the NAAQS.

36 The BCNM region is largely rural. EPA has designated the region as an attainment area for all  
37 criteria pollutants. The primary air quality concern in the region is particle pollution from wood  
38 burning and road dust (CDPHE 2017).



1 The existing air quality conditions can be characterized by estimated levels of emissions in the  
 2 region, measured ambient pollutant concentrations, and levels of AQRVs in the region. The most  
 3 commonly measured AQRVs are visibility and acidic deposition.

4 AQRVs are of special concern in Class I areas<sup>1</sup> (national parks and wilderness areas). Portions of  
 5 five Class I areas are located within 100 km of BCNM: West Elk Wilderness, Maroon Bells-  
 6 Snowmass Wilderness, Eagles Nest Wilderness, La Garita Wilderness, and Great Sand Dunes  
 7 National Park. Additional areas of concern for AQRVS, known as sensitive Class II areas, also  
 8 are located wholly or partially within 100 km of BCNM: Fossil Ridge Wilderness, Raggeds  
 9 Wilderness, Hunter-Fryingpan Wilderness, Holy Cross Wilderness, Mount Evans Wilderness,  
 10 Lost Creek Wilderness, Sangre de Cristo Wilderness, Baca National Wildlife refuge, Curecanti  
 11 NRA, and Florissant Fossil Beds National Monument. Figure 2-1 shows these areas in relation to  
 12 BCNM.

13 **Emissions**

14 CDPHE and EPA maintain an accounting of emissions from all sources in Colorado. This  
 15 emissions inventory provides perspective on the contributions to existing air quality and their  
 16 scale relative to other actions. Table 2-1 summarizes the emissions inventory for 2014 which is  
 17 the most recent year for which complete data are available. The inventory provides data at the  
 18 county level. Because BCNM is located at the eastern edge of Chafee County, near its  
 19 intersection with Fremont County and Park County, data for all three counties is shown to reflect  
 20 the larger BCNM region.

**Table 2-1 Existing Emissions in the Region**

Area	2014 Criteria Pollutant Emissions (tons per year)					
	CO	NO <sub>x</sub> <sup>a</sup>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	VOC <sup>b</sup>
Chafee County	5,393	530	2,321	489	28	1,152
Fremont County	8,037	2,187	3,420	704	293	2,389
Park County	6,314	577	3,910	719	22	1,325
3-County Region	19,744	3,294	9,651	1,911	342	4,866
Statewide	879,396	2,740,66	360,600	74,351	33,866	314,390

Source: EPA 2017a

<sup>a</sup> Oxides of nitrogen (includes NO<sub>2</sub>)

<sup>b</sup> Volatile organic compounds

21 Emissions of GHGs can affect climate. The primary GHGs are carbon dioxide (CO<sub>2</sub>), methane  
 22 (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and certain industrial gases. EO #D 004 08 issued by then Governor

---

<sup>1</sup> As defined by the CAA, Class I air quality areas include national parks larger than 6,000 acres and wilderness areas larger than 5,000 acres that existed or were authorized as of August 7, 1977. They receive the highest degree of air quality protection under the CAA.

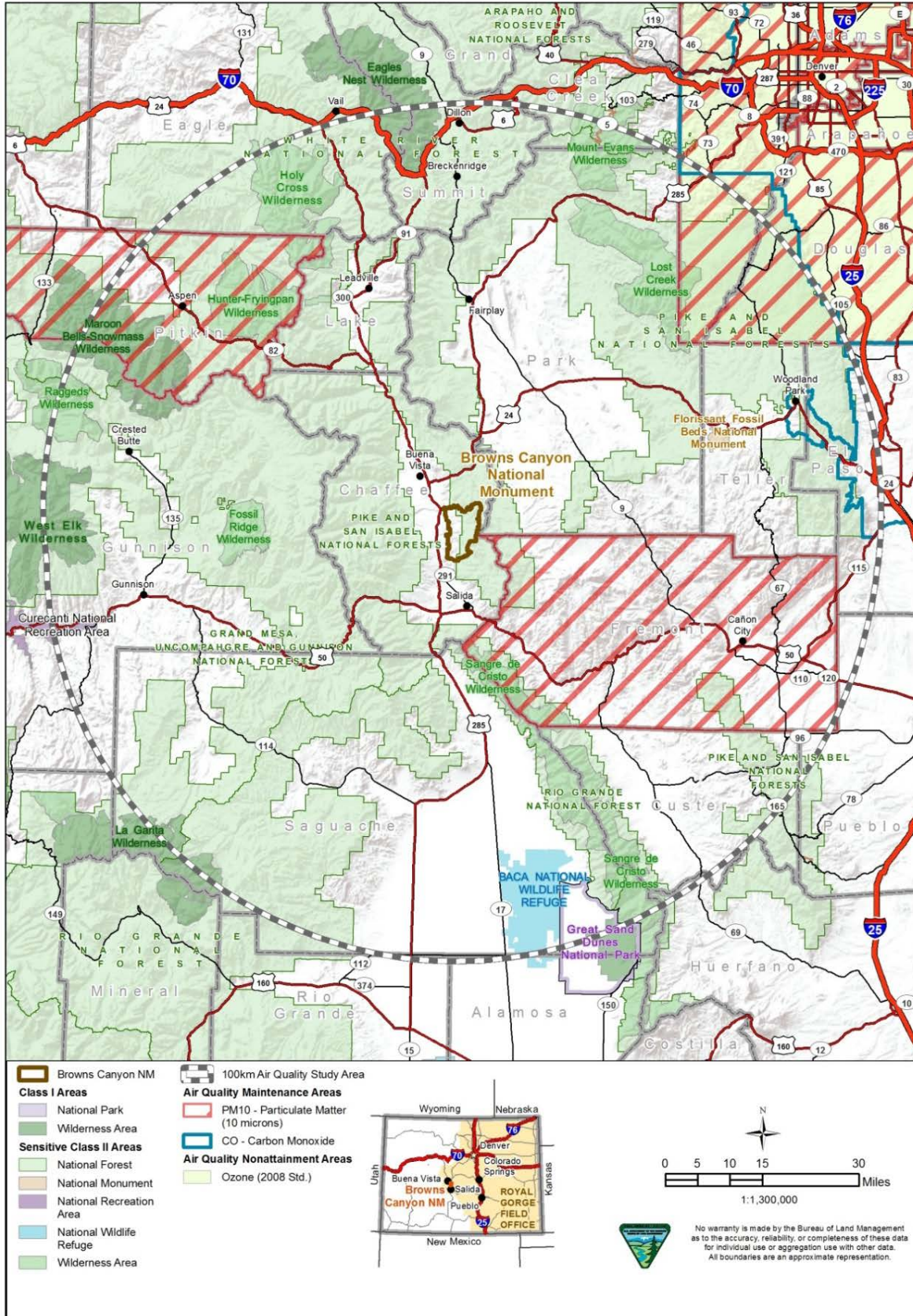
1 Bill Ritter, Jr. in 2008 directed CDPHE to updated the state’s GHG inventory every five years.  
2 Emissions of each GHG gas are expressed in terms of carbon dioxide equivalent (CO<sub>2</sub>e) to  
3 reflect the different global warming potentials of the various gases. The most recent update of the  
4 inventory projects that Colorado’s GHG emissions in 2020 will be 98.3 million metric tons per  
5 year carbon dioxide equivalent (MMT CO<sub>2</sub>e) of CO<sub>2</sub>, 28.4 MMT CO<sub>2</sub>e of CH<sub>4</sub>, 3.9 MMT CO<sub>2</sub>e  
6 of N<sub>2</sub>O, and 3.3 MMT CO<sub>2</sub>e of industrial GHGs (CDPHE 2014). The total GHG emissions  
7 statewide is the sum of the individual GHG emissions, or 133.9 MMT CO<sub>2</sub>e.

8 No information is available specifically quantifying emissions associated with activities in  
9 BCNM. However, because there is no major commercial or industrial development within  
10 BCNM, current emissions likely are very small.

11 **Measured Pollutant Concentrations**

12 CDPHE measures ambient pollutant concentrations at a number of monitoring sites throughout  
13 the state. There are no monitors in the immediate vicinity of BCNM. The nearest monitoring  
14 sites to BCNM are located in the Aspen, Cañon City, Colorado Springs, and Crested Butte areas  
15 (CDPHE 2017). Monitoring data indicate that in 2014-2016 there were no violations of the  
16 NAAQS in the BCNM region.

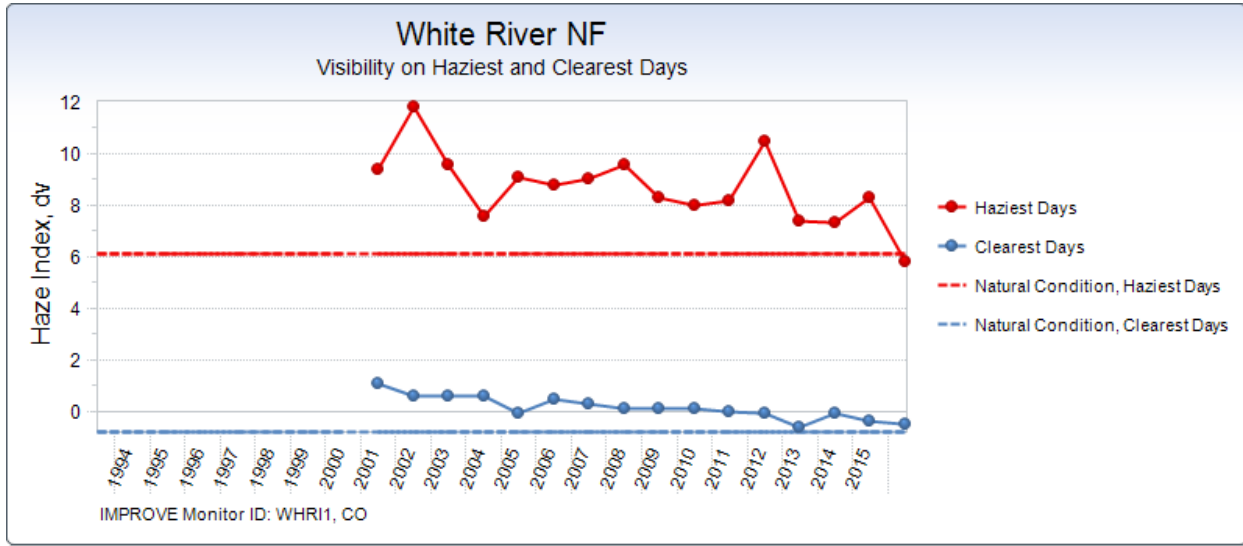
17



1  
2 **Figure 2-1 Air Quality Study Area**

1 **Visibility**

2 Monitors in the nationwide federal Interagency Monitoring of Protected Visual Environments  
 3 (IMPROVE) network provide information on current visibility levels and trends in visibility. The  
 4 nearest IMPROVE monitor to the study area is located in the White River National Forest.  
 5 Figure 2-2 shows visibility levels as measured at this monitor. In general, trends with a negative  
 6 slope (downward left-to-right) indicate declining impacts (improving atmospheric conditions).  
 7 Figure 2-2 shows that visibility at the White River National Forest is less than natural conditions  
 8 but generally has been improving over time.

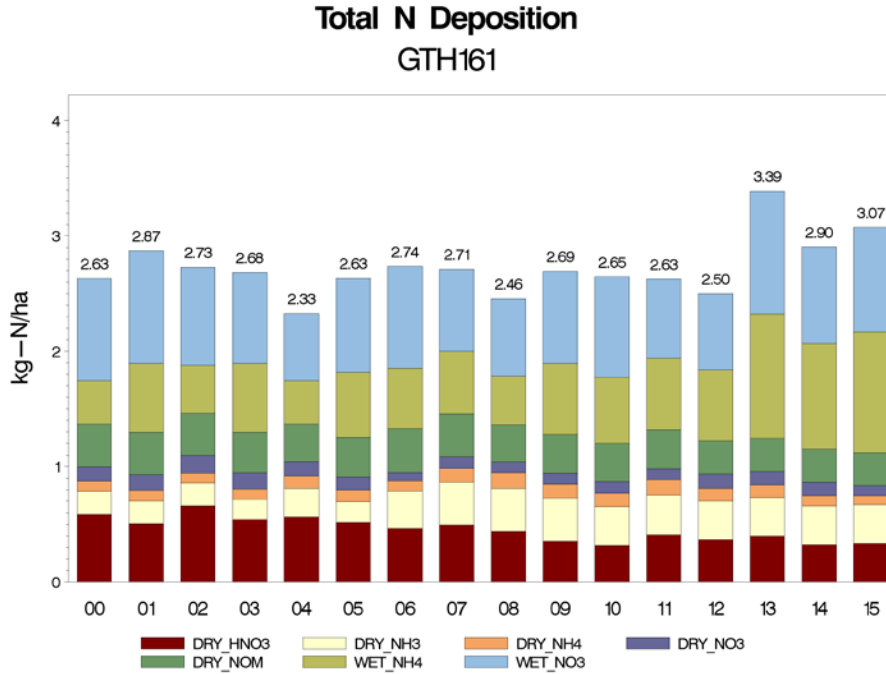


9 Source: CSU 2017  
 10 Visibility is a subjective measure of the distance that light or an object can clearly be seen by an observer. Light extinction is  
 11 used as a measure of visibility and is calculated from the monitored components of fine particle mass (aerosols) and relative  
 12 humidity. In the chart visibility is expressed as a haze index measured in terms of deciviews, a measure for describing perceived  
 13 changes in visibility. One deciview is defined as a change in visibility that is just perceptible to an average person, which is  
 14 approximately a 10-percent change in light extinction.  
 15

16 **Figure 2-2 Visibility Trends for White River National Forest**

17 **Acidic Deposition**

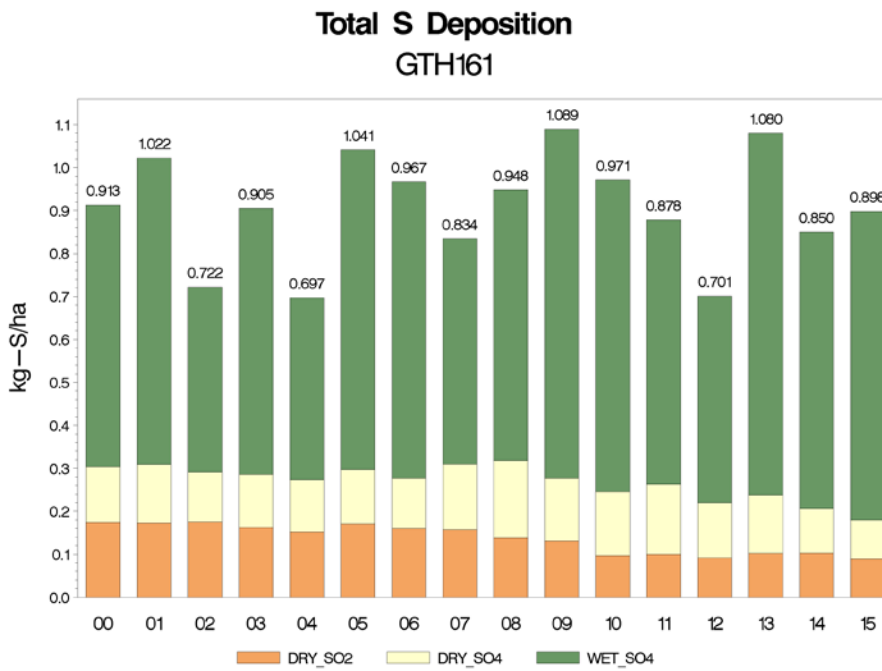
18 Emissions of NO<sub>x</sub> and SO<sub>2</sub> can undergo chemical reactions in the atmosphere that can result in  
 19 formation of sulfuric acid, nitric acid, and other acidic compounds. These compounds can be  
 20 deposited on the ground or into water bodies which can result in fertilization and acidification of  
 21 soils and surface waters (Forest Service 2009). Monitors in the interagency Clean Air Status and  
 22 Trends Network (CASTNET) provide information on current acidic deposition levels and trends  
 23 in deposition. The CASTNET deposition monitor with available air quality trend data nearest to  
 24 the study area is located in Gunnison National Forest. Figure 2-3 shows acidic deposition levels  
 25 and trends as measured at this monitor. In general, trends with a negative slope indicate declining  
 26 impacts (improving atmospheric conditions). Figure 2-3 shows no clear trend in total nitrogen or  
 27 sulfur deposition rates over time.



1

Source: CASTNET & Interpolated NADP-NTN/FRISM/CMAQ

09AUG17



2  
3  
4  
5  
6  
7

Source: CASTNET & Interpolated NADP-NTN/FRISM/CMAQ

09AUG17

Source: EPA 2017b

Deposition rate units are kilograms of nitrogen or sulfur per hectare per year (kg-N/ha or kg-S/ha, respectively).

**Figure 2-3 Nitrogen (N) and Sulfur (S) Deposition Trends for Gunnison National Forest**

**2.1.1.5 Existing Management Direction**

Prior to BCNM designation, permitted activities that could result in emissions or air quality effects were managed under the 1996 RGRMP and 1984 Pike – San Isabel Forest Plan. Table 1-2 lists additional relevant, existing Federal, state, and local management direction and guidance for air quality in BCNM.

**BLM Royal Gorge Resource Area RMP (Eco-Subregion 1, Arkansas River)**

No management direction specific to air quality was included in the RMP. Management for other resource uses that could affect air quality (e.g., recreation and livestock grazing) are addressed in their respective sections.

**USFS Pike – San Isabel Forest Plan**

No management direction specific to air quality was included in the Forest Plan. Management for other resource uses that could affect air quality (e.g., recreation and livestock grazing) are addressed in their respective sections.

**2.1.1.6 Needs for Change and Management Opportunities**

Given the resource conditions, trends, and existing management in BCNM, Table 2-2 summarizes needs for change and management opportunities to consider in the BCNM MP.

**Table 2-2 Needs for Change and Management Opportunities for Air Quality**

Needs for Change	Management Opportunities
Potential increases in motorized vehicle use	<p>Substantial new emissions from motorized vehicle use are not anticipated due to constraints in Proclamation 9232. WSA and overlapping special designations include development constraints which would limit the potential for new development. As a result, there is no anticipated need for changes to management plan components with respect to preservation of air quality.</p> <p>Although new development would be limited, a significant increase in visitation could result in substantially increased motorized vehicle use. In that event BCNM could consider the following measures:</p> <ul style="list-style-type: none"> <li>• Develop and implement a traffic management plan for motorized vehicles, both on- and off-road.</li> <li>• Encourage non-motorized rather than motorized recreational activities.</li> <li>• Coordinate with management opportunities for recreation to minimize motorized vehicle use.</li> </ul>
Potential air quality impacts in the event of significant oil and gas development	<p>In the event of significant oil and gas development in the area that could affect air quality, BCNM could reevaluate the need for management actions. BCNM could consider the following measures:</p> <ul style="list-style-type: none"> <li>• Monitor the pace and location of oil and gas development in the region surrounding BCNM.</li> <li>• Participate in opportunities to review and comment during the permitting and NEPA processes for proposed oil and gas projects.</li> </ul>

1 **2.1.2 Climate**

2 This section describes the existing and reasonably foreseeable climate conditions within the  
3 BCNM boundary as well as the surrounding areas. Climate is influenced by variations in latitude,  
4 elevation, topographic features, and moisture levels, including effects of surface water bodies.  
5 Global climate change trends include increased ocean and surface temperatures, a decrease in the  
6 size of glaciers, a decrease in snow cover for many regions in the Northern Hemisphere, rising  
7 sea levels, and an increase in the intensity and severity of extreme weather events (USDA  
8 Undated [a]). A buildup of GHGs in the atmosphere is changing Earth’s energy balance and  
9 causing the planet to warm, which in turn, affects local climate conditions. Scientists refer to this  
10 phenomenon as *global climate change*. These global changes have been attributed mainly to  
11 anthropogenic influences, primarily the increase in concentrations of GHGs in the atmosphere to  
12 the highest levels in at least 800,000 years. As GHGs and other human effects on the climate  
13 continue to increase, Colorado is expected to warm even more by the mid-21st century, pushing  
14 temperatures outside of the range of the past century (Lukas et al 2014).

15 Due to atmospheric mixing, climate change effects occurring in the BCNM are a result of global  
16 GHG concentration in the atmosphere, and not directly related to local GHG emissions.  
17 However, GHG emissions from activities occurring within BCNM would contribute to global  
18 GHG levels. Sources of GHG emissions within BCNM are relatively few and small, consisting  
19 mostly of motor vehicles traveling on internal roads and trails, and a few buildings that support  
20 operations and maintenance. To the extent that visitation may increase in the future, GHG  
21 emissions from motor vehicle use within BCNM would also increase. The Proclamation  
22 identifies BCNM as an important area for studies on the effects of climate change.

23 Planning issues and management concerns based on Proclamation 9232 and additional agency  
24 concerns include:

- 25 • How does BLM and USFS respond to 30-yr climate trends including temperature,  
26 precipitation, snowpack, drought (Colorado, Central-Southern Rockies, Arkansas  
27 headwaters, BCNM) and effects on monument resources, objects, and values (ROVs)?
- 28 • What BLM and USFS decisions are necessary to protect monument ROV and mitigate  
29 climate effects to: springs, seeps, river corridor, riparian areas, woodlands, forest  
30 communities, terrestrial and avian habitat?
- 31 • How does BLM and USFS adaptively respond to adverse climate change contribution to  
32 monument water, soil, riparian, habitat, sensitive species and potential to inhibit  
33 achievement of BLM Colorado public land health standards and USFS standards and  
34 guidelines for ecological integrity?
- 35 • What decisions are necessary to protect monument ROV and mitigate climate effects to:  
36 springs, seeps, river corridor, riparian areas, woodlands, forest communities, and  
37 terrestrial and avian habitat?

- 1 • How does BLM and USFS respond to adverse climate change contribution to monument  
2 water, soil, riparian, habitat, sensitive species and potential to inhibit achievement of  
3 BLM Colorado public land health standards and USFS standards and guidelines for  
4 ecological integrity?
- 5 • What decisions are necessary to protect monument ROV and mitigate climate effects to  
6 due to climate synergistic effects on insects, pests, disease on watersheds, terrestrial  
7 vegetation, wildlife, avian habitat, and ecology integrity?

#### 8 **2.1.2.1 Assessment Area**

9 The geographic area considered for characterizing climate conditions and trends will be the  
10 BCNM boundary as well as the surrounding areas, which include but are not limited to AHRA  
11 and San Isabel National Forest.

#### 12 **2.1.2.2 Best Available Scientific Information**

13 Berner, L.T., B.E. Law, A.J.H. Meddens, and J.A. Hicke. 2017. Tree mortality from fire bark  
14 beetles, and timber harvest during a hot and dry decade in the western United States.  
15 *Environmental Research Letters*. **12** 0065005.

16 Colorado Department of Public Health and Environment (CDPHE). 2014. Colorado Greenhouse  
17 Gas Inventory—2014 Update Including Projections to 2020 & 2030. Available online:  
18 <https://www.colorado.gov/pacific/sites/default/files/AP-COGHGInventory2014Update.pdf>.  
19 December 28, 2017.

20 Colorado Department of Transportation. 2015. Colorado Climate Plan; State Level Policies and  
21 Strategies to Mitigate and Adapt. Available:  
22 <https://www.codot.gov/programs/environmental/sustainability/colorado-climate-plan-2015>.

23 Colorado Natural Heritage Program [CNHP]. 2015. Climate Change Vulnerability Assessment  
24 for Colorado Bureau of Land Management. K. Decker, L. Grunau, J. Handwerk, and J.  
25 Siemers, editors. Colorado Natural Heritage Program, Colorado State University, Fort Collins,  
26 Colorado.

27 Cook, B.I., T.R. Ault, and J.E. Smerdon. 2015. Unprecedented 21<sup>st</sup> century drought risk in the  
28 American Southwest and Central Plains. *Science Advances*, 1(1). Available:  
29 <http://advances.sciencemag.org/content/1/1/e1400082.full>.

30 Gunnison Climate Working Group. 2011. Gunnison Basin Climate Change Vulnerability  
31 Assessment. December. Available: [http://wwa.colorado.edu/publications/reports/TNC-CNHP-](http://wwa.colorado.edu/publications/reports/TNC-CNHP-WWA-UAF_GunnisonClimChangeVulnAssess_Report_2012.pdf)  
32 [WWA-UAF\\_GunnisonClimChangeVulnAssess\\_Report\\_2012.pdf](http://wwa.colorado.edu/publications/reports/TNC-CNHP-WWA-UAF_GunnisonClimChangeVulnAssess_Report_2012.pdf).



- 1 Lukas, Jeff et al., 2014. Climate Change in Colorado – A Synthesis to Support Water Resources  
2 Management and Adaptation; A report for the Colorado Water Conservation Board.  
3 Available online:  
4 [http://wwa.colorado.edu/climate/co2014report/Climate\\_Change\\_CO\\_Report\\_2014\\_FINAL.pd](http://wwa.colorado.edu/climate/co2014report/Climate_Change_CO_Report_2014_FINAL.pdf)  
5 [f](http://wwa.colorado.edu/climate/co2014report/Climate_Change_CO_Report_2014_FINAL.pdf)
- 6 Muhlfeld, Chris, 2014, Invasive hybridization in a threatened species is accelerated by climate  
7 change, *Nature Climate Change*, 4, 620-624. Available online:  
8 [http://hs.umd.edu/dbs/labs/lowe/documents/publications/Muhlfeld%20et%20al\\_Nature%20Cli](http://hs.umd.edu/dbs/labs/lowe/documents/publications/Muhlfeld%20et%20al_Nature%20Climate%20Change_)  
9 [mate%20Change\\_](http://hs.umd.edu/dbs/labs/lowe/documents/publications/Muhlfeld%20et%20al_Nature%20Climate%20Change_)
- 10 Pritechett, J., C. Goemans, and R. Nelson. 2013. Estimating the Short and Long-term Economic  
11 and Social Impacts of the 2012 Drought in Colorado. Available:  
12 <http://cwcbweblink.state.co.us/WebLink/0/doc/172871/Electronic.aspx>. Accessed February 7,  
13 2018.
- 14 Rondeau, R., M. Bidwell, B. Neely, I. Rangwala, L. Yung, and C. Wyborn. 2017. Pinyon-Juniper  
15 Landscape: San Juan Basin, Colorado Social-Ecological Climate Resilience Project. North  
16 Central Climate Science Center, Ft. Collins, Colorado. Available:  
17 [http://www.cnhp.colostate.edu/download/documents/2017/SECR\\_PJ\\_Landscape\\_Report\\_21F](http://www.cnhp.colostate.edu/download/documents/2017/SECR_PJ_Landscape_Report_21F)  
18 [EB\\_Final.pdf](http://www.cnhp.colostate.edu/download/documents/2017/SECR_PJ_Landscape_Report_21F)
- 19 Ryan, W. and N. Doesken, 2012. Drought of 2012 in Colorado. Colorado Climate Center.  
20 Department of Atmospheric Science, Colorado State University, Fort Collins, Colorado.  
21 Available: [http://climate.colostate.edu/pdfs/drought\\_2012.pdf](http://climate.colostate.edu/pdfs/drought_2012.pdf). Accessed February 7, 2018.
- 22 U.S. Climate Data. 2018. Buena Vista, Colorado. Available at:  
23 <https://www.usclimatedata.com/climate/buena-vista/colorado/united-states/usco0046>.  
24 Accessed February 6, 2018.
- 25 U.S. Geological Survey (USGS), U.S. Forest Service (USFS), and U.S. Department of the Interior  
26 (DOI). 2018. Monitoring Trends in Burn Severity. Interactive Web Viewer. Available:  
27 <https://www.mtbs.gov/viewer/index.html>. Accessed February 6, 2018.
- 28 U.S. Department of Agriculture (USDA), Forest Service. Undated (a). What Are the  
29 Impacts? Available at: [https://www.fs.fed.us/science-technology/climate-change/what-are-](https://www.fs.fed.us/science-technology/climate-change/what-are-the-impacts)  
30 [the-impacts](https://www.fs.fed.us/science-technology/climate-change/what-are-the-impacts).
- 31 U.S. Department of Agriculture (USDA), Forest Service. Undated (b). Climate Change Effects  
32 on Forests and Grasslands. Available at: [https://www.fs.usda.gov/ccrc/education/climate-](https://www.fs.usda.gov/ccrc/education/climate-change-effects-forests-and-grasslands)  
33 [change-effects-forests-and-grasslands](https://www.fs.usda.gov/ccrc/education/climate-change-effects-forests-and-grasslands).
- 34 U.S. Environmental Protection Agency. 2016. Climate Change Indicators. Available:  
35 <https://www.epa.gov/climate-indicators/climate-change-indicators-climate-forcing>. Accessed:  
36 January 4, 2018.

- 1 U.S. Forest Service (USFS). 2016. Forest Health Annual Aerial Survey Report. Available at:  
2 <https://www.fs.usda.gov/main/r2/forest-grasslandhealth>. Accessed on February 7, 2018.
- 3 U.S. Global Change Research Program. 2014. The Third National Climate Assessment.  
4 Available: <http://nca2014.globalchange.gov/highlights/report-findings/human-health>
- 5 Vano, J.A., B. Udall, D.R. Cayan, J.T. Overpeck, L.D. Brekke, T. Das, H.C. Hartmann, D.P.  
6 Lettenmaier. 2014. Understanding uncertainties in future Colorado River Streamflow. Bulletin  
7 of the American Meteorological Society, 95(1): 59-78. Available:  
8 <https://journals.ametsoc.org/doi/pdf/10.1175/BAMS-D-12-00228.1>.
- 9 Watson, Leroy J., et al. 2016. San Luis Valley – Taos Plateau Level IV Ecoregion Landscape  
10 Assessment. Available:  
11 [https://www.blm.gov/sites/blm.gov/files/uploads/Landscape%20Assessment%20Final%20Re](https://www.blm.gov/sites/blm.gov/files/uploads/Landscape%20Assessment%20Final%20Report.pdf)  
12 [port.pdf](https://www.blm.gov/sites/blm.gov/files/uploads/Landscape%20Assessment%20Final%20Report.pdf).
- 13 Western Regional Climate Center (WRCC). 2016. Climate of Colorado. Available  
14 at: [https://wrcc.dri.edu/Climate/narrative\\_co.php](https://wrcc.dri.edu/Climate/narrative_co.php).
- 15 Woodhouse, C.A., G.T. Pederson, K. Morino, S.A. McAfee, and G.J. McCabe. 2016. Increasing  
16 influence of air temperature on upper Colorado River streamflow. Geophysical Research  
17 Letters, 43. Available:  
18 <http://www.riversimulator.org/Resources/ClimateDocs/IncreasingInfluenceOfAirTemperature>  
19 [OnUpperColoradoRiverStreamflowWoodhouse2016.pdf](http://www.riversimulator.org/Resources/ClimateDocs/IncreasingInfluenceOfAirTemperature).

## 20 **GIS Data**

- 21 • NPS Boundary nps\_boundary.shp. Accessed 9 September 2016.  
22 <https://irma.nps.gov/DataStore/Reference/Profile/2224545?Inv=True>
- 23 • USFWS FWSInterest. Accessed 1 February 2017. <https://www.fws.gov/gis/data/national/>

### 24 **2.1.2.3 Limitations/Data Gaps**

25 Studies conducted within BCNM addressing current landscape resiliency and response to climate  
26 change are lacking. Therefore, this planning assessment largely relies on regional and global data  
27 to make inferences concerning climate change and its effects within BCNM.

### 28 **2.1.2.4 Existing Conditions and Trends**

29 The elevation gradient within BCNM, ranging from 7,300 to 10,000 feet, creates climate  
30 gradient that becomes cooler and wetter with increasing elevation. The highest temperatures in  
31 the summer months are usually 80-90°F at lower elevations, and 70-80°F at higher elevations.

32 Prevailing air currents reach Colorado from westerly directions. Eastward-moving storms  
33 originating in the Pacific Ocean lose much of their moisture as rain or snow on mountaintops and  
34 westward-facing slopes. Due to its location on the eastern side of the Arkansas River Valley, east

1 of and on the leeward side of the Sawatch Mountain Range, BCNM receives relatively little  
2 precipitation, especially at lower elevations. Average annual rainfall in Buena Vista, Colorado,  
3 approximately 7 miles north in the Arkansas River Valley at an elevation of approximately 8,000  
4 feet, is 10.5 inches per year, with 41 inches of snow per year (U.S. Climate Data 2018). Most  
5 precipitation occurs during July and August from afternoon thunderstorms.

6 There is broad scientific consensus that humans are changing the chemical composition of the  
7 Earth's atmosphere. Activities such as fossil fuel combustion, deforestation, agriculture, and  
8 other changes in land use produce GHG emissions and are resulting in the atmospheric  
9 accumulation of GHGs. An increase in GHG concentrations results in an increase in the Earth's  
10 average surface temperature, primarily by decreasing the amount of heat energy that would  
11 normally be radiated back into space (radiative forcing<sup>2</sup>). This global temperature increase is  
12 expected to affect regional weather patterns, precipitation rates, and frequency and intensity of  
13 extreme weather events.

14 In Colorado, climate change is projected to result in a future outcome that includes warmer  
15 temperatures, earlier snowmelt, and more frequent and severe droughts. Climate model  
16 projections indicate that these temperature increases are likely to continue into the future. This  
17 projected future warming trend may result in increased frequency and severity of heat waves,  
18 droughts, and wildfires in Colorado by the mid-21st century (Cook et al 2015; Watson et al.  
19 2016). Drought conditions in the Colorado River Basin have persisted in recent years, and these  
20 conditions are exacerbated by warm temperatures that may result in low stream flows. Warming  
21 temperatures combined with natural drought variability may increase drought severity, which  
22 will effect demand for water by both human and biological populations (Vano et al. 2014;  
23 Woodhouse et al. 2016).

24 Changes in biological populations have also been observed in the region that are consistent with  
25 these climatic changes, and recent studies indicate that species modifications are occurring.  
26 Muhlfeld (2014) connected warmer temperatures and decreased precipitation to accelerated  
27 hybridization (cross-breeding between invasive and native species) of rainbow trout and the  
28 westslope cutthroat trout in the northern Rocky Mountains. Scientists have theorized such  
29 species changes for years but this was the first time research results provided documentation.

### 30 **Emissions**

31 The primary GHGs are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and certain  
32 industrial gases. EO #D 004 08 issued by then Governor Bill Ritter, Jr. in 2008 directed CDPHE  
33 to update the state's GHG inventory every 5 years. Emissions of GHGs are expressed in terms  
34 of carbon dioxide equivalent (CO<sub>2</sub>e) to reflect the different global warming potentials of the

---

<sup>2</sup> Radiative forcing is the measure in watts per square meter that represents the size of the energy imbalance attributable to GHG in the atmosphere – the difference between incoming solar radiation and outgoing infrared radiation (EPA 2016).

1 various gases. Carbon dioxide is by far the largest contributing GHG in Colorado, representing  
2 75 percent of emissions in 2010, and is projected to remain at a similar percentage through 2030.  
3 Methane is the next highest contributing GHG. Methane is emitted from many sources including  
4 coal mines, agriculture, and oil and gas facilities (CODOT 2015).

5 The most recent update of the state's inventory forecasts Colorado's GHG emissions in 2020 will  
6 be:

- 7 • 98.3 million metric tons per year carbon dioxide equivalent (MMT CO<sub>2</sub>e) of CO<sub>2</sub>,
- 8 • 28.4 MMT CO<sub>2</sub>e of CH<sub>4</sub>,
- 9 • 3.9 MMT CO<sub>2</sub>e of N<sub>2</sub>O,
- 10 • and 3.3 MMT CO<sub>2</sub>e of industrial GHGs (CDPHE 2014).

11 The total GHG emissions statewide is the sum of the individual GHG emissions, or 133.9 MMT  
12 CO<sub>2</sub>e.

13 No information is available specifically quantifying emissions associated with activities in  
14 BCNM. However, because there is no major commercial or industrial development within  
15 BCNM, current emissions are considered small and will not significantly contribute to global or  
16 even regional GHG emissions.

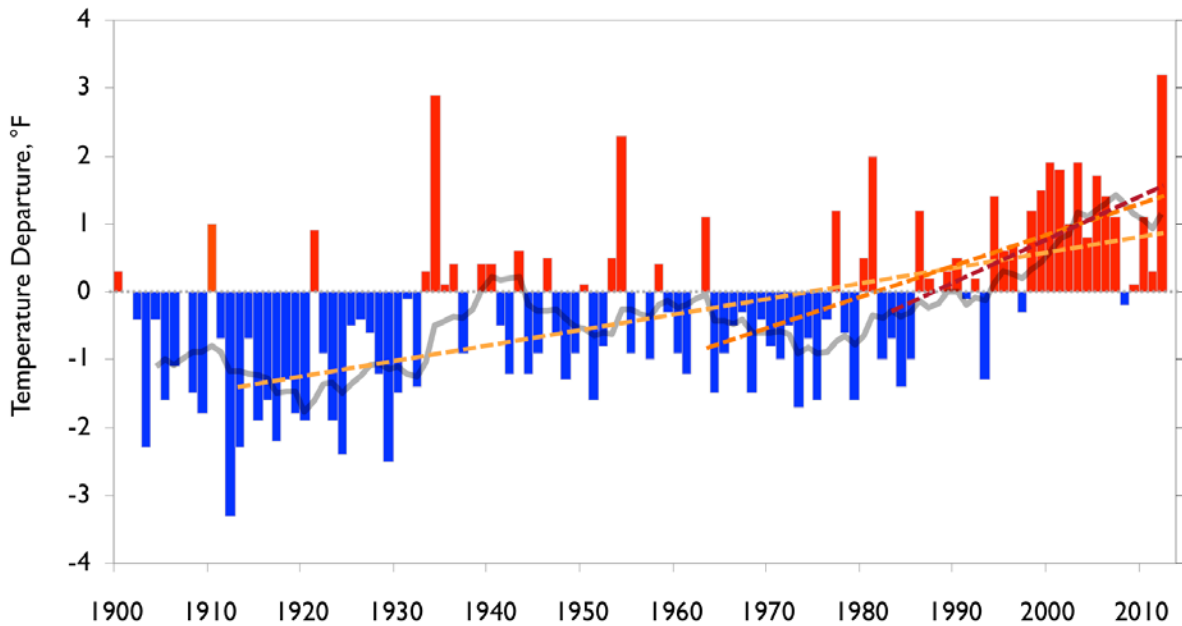
### 17 **Climate, Temperature, and Precipitation Trends**

18 There is broad scientific consensus that humans are changing the chemical composition of the  
19 Earth's atmosphere. Activities such as fossil fuel combustion, deforestation, agriculture, and  
20 other changes in land use produce GHG emissions and are resulting in the atmospheric  
21 accumulation of GHGs. An increase in GHG concentrations results in an increase in the Earth's  
22 average surface temperature, primarily by decreasing the amount of heat energy that would  
23 normally be radiated back into space (radiative forcing). This global temperature increase is  
24 expected to affect regional weather patterns, precipitation rates, frequency, and intensity of  
25 extreme weather events, average sea level rise, ocean acidification, and polar ice levels, which  
26 are collectively referred to as climate change. In Colorado, climate change is predicted to result  
27 in warmer temperatures, earlier snowmelt, and more frequent and severe droughts.

28 Data on global land and ocean surface temperatures show warming of between 0.65°C and  
29 1.06°C, for an average combined global warming of 0.85°C over the period 1880 to 2012. In  
30 Colorado, statewide annual average temperatures have increased by 2.0°F and 2.5°F over the  
31 past 30 and 50 years respectively (Lukas et al. 2014). Scientists observe warming trends over this  
32 period in most parts of the State, and observations show that daily minimum temperatures have  
33 warmed more than daily maximum temperatures. Additionally, temperature increases have  
34 occurred in all seasons. No long-term trends in average annual precipitation (30–50 years) have  
35 been detected across Colorado, although since 2000, the State has experienced below-average

1 annual precipitation and snow pack. These warming trends have contributed to an approximately  
2 1- to 4-week earlier snowmelt and peak runoff in spring (Lukas et al. 2014).

3 Figure 2-4 shows the annually-averaged temperature for the state of Colorado between 1900 and  
4 2012. Annual departures are shown relative to a 1971–2000 reference period. The light-orange,  
5 orange, and red lines are the 100-year, 50-year, and 30-year trends, respectively. All three trends  
6 show statistically significant warming. The gray line shows the 10-year running average. The  
7 record shows a cool period from 1900 to 1930, a warm period in the 1930s and again in the  
8 1950s, a cool period in the late 1960s and 1970s, and consistently warm temperatures since the  
9 mid-1990s (Lukas et al., 2014).



10

11 **Figure 2-4 Colorado Statewide Annual Temperature, 1900-2012**

12 Source: Lukas et al. 2014

13 **Future Projections**

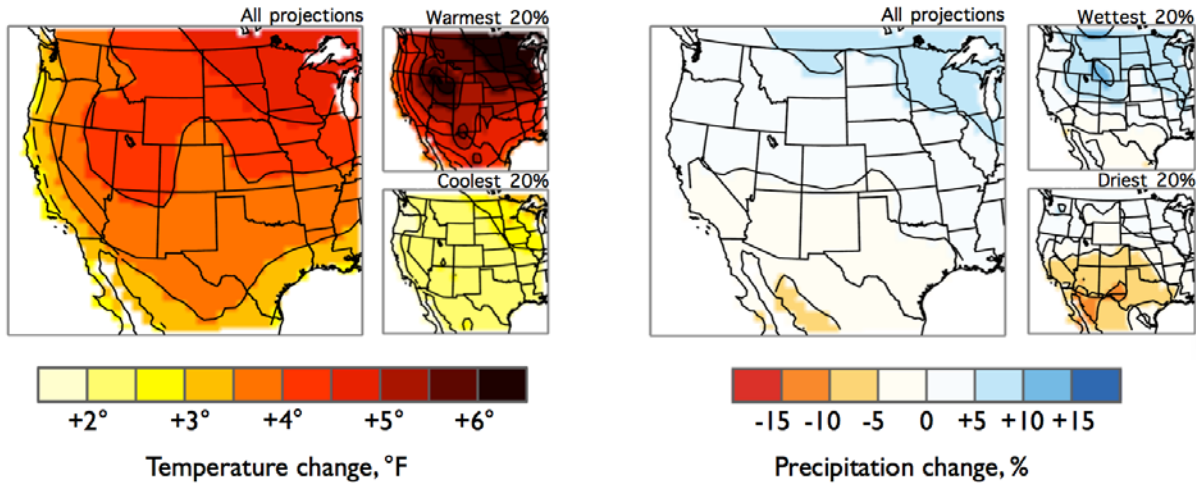
14 Current climate model projections indicate with relatively high certainty that temperatures in  
15 Colorado will continue to warm, with summer temperatures projected to warm slightly more than  
16 winter temperatures. Statewide average annual temperatures are projected to warm by 2.5°F to  
17 5°F by 2050 relative to a 1971–2000 baseline under a medium-low emissions scenario. Under a  
18 high emissions scenario, the statewide average annual temperatures are projected to warm by  
19 3.5°F to 6.5°F (Lukas et al., 2014).

20 Overall projections of future precipitation show high variability, and sometimes different models  
21 or emissions scenarios project opposite patterns in rainfall during the same season (USDA  
22 Undated (b)). While climate projections around future precipitation in Colorado vary, they do

1 reveal several important changes, including a 10-25% decrease in average annual runoff, more  
2 precipitation falling as rain rather than snow, earlier snowmelt and spring runoff peaks, and  
3 changes in the seasonality of flooding (Gunnison Climate Working Group 2011; Lukas et al.,  
4 2014). Recent studies indicate that stream flow in the Colorado River Basin may continue to  
5 decline regardless of seasonal precipitation levels. Reduction in flows due to warming may be  
6 exacerbated in the Colorado River Basin; increases in evapotranspiration from warming  
7 temperatures have a larger effect on runoff in the Colorado basin compared to more humid river  
8 basins (Vano et al. 2014). There may be a temperature-driven trend for stream flow and runoff  
9 resulting from warming temperatures in the basin (Woodhouse et al. 2016). Applied to the  
10 BCNM, these studies suggest how climate change effects could reduce surface stream flow and  
11 surface water in seeps and springs that could alter aquatic and riparian communities within the  
12 BCNM.

13 Future precipitation projections are uncertain for Colorado as a whole, although a slight majority  
14 indicate a minor increase by 2050. However, they also indicate a gradient in which the southern  
15 part of the state, where the BCNM is located, has drier future outcomes than the northern part of  
16 the state (Lukas et al. 2014). Furthermore, all projected trends are less in magnitude than the  
17 historical variability of the 30-year running average from 1900 to 2012, meaning it will be  
18 difficult to detect against natural variability (Lukas et al. 2014). Downscaled precipitation  
19 models to project future precipitation for the Arkansas Valley to increase slightly, with 1 to 20%  
20 increased precipitation from November through May) and 1 to 10% decreased precipitation from  
21 May through October (Lukas et al. 2014).

22 Figure 2-5 shows the projected changes in annual average temperature and precipitation in the  
23 western U.S. by 2050. For Colorado, the models show substantial warming with some change in  
24 precipitation.



1  
 2 **Figure 2-5 Projected Annual Temperature and Precipitation Changes for the Western U.S.**  
 3 **Under a Medium-Low Emissions Scenario for 2050**

4 Source: Lukas et al. 2014

5 **Climate Impacts on Other Resources**

6 Climate warming in Colorado affects patterns of water availability and weather, which in turn  
 7 affect ecosystems, wildlife, and agriculture, and human health. Water availability changes  
 8 include reduced snowpack, altered timing of snowmelt and streamflows, soil moisture deficits,  
 9 and more intense precipitation events. Extreme weather includes increased frequency and  
 10 intensity of heat waves, droughts, and wildfires.

11 Colorado has already experienced an increase in disturbances from insect infestations, diseases,  
 12 and wildfire that are affecting native vegetation communities throughout the state. Tree mortality  
 13 from spruce beetle and mountain pine beetle has escalated rapidly since 1996, affecting hundreds  
 14 of thousands of acres annually across Colorado (USFS 2016); relative to other western states,  
 15 Colorado had a much larger proportion of tree mortality from 2003 to 2012 (Berner et al. 2017).  
 16 These outbreaks are correlated with higher temperatures and drought conditions experienced  
 17 since the late 1990s, and aerial surveys indicate moderate to severe spruce and mountain pine  
 18 beetle activity encroaching on the boundaries of the BCNM (USFS 2016). The annual acreage of  
 19 wildfires in Colorado also shows an increasing trend from 1984 through 2015 (USGS, USFS,  
 20 and DOI 2018). The extent of wildfires was greatest in 2002 and 2012, with over 400 thousand  
 21 and 200 thousand acres burned respectively, corresponding with severe drought years (Ryan and  
 22 Doesken 2012).

23 The piñon-juniper community, comprising almost 50% of the BCNM, is vulnerable to climate  
 24 change effects that could have extensive impacts on ROVs. High-severity fires are likely to  
 25 result in mortality of piñon and juniper trees, which may not return. For example, burned piñon-  
 26 juniper communities have not returned in Mesa Verde National Park, and were instead replaced  
 27 by shrubland (CNHP 2015). A study in the San Juan Basin investigated the response of the

1 piñon-juniper community to multiple climate scenarios to better understand the potential social  
2 and ecological implications. This study identified key strategies of identifying and protecting  
3 persistent piñon-juniper communities in climate refugia and linkages, proactively managing for  
4 resilience to climate change effects, and facilitating transformation to or away from the piñon-  
5 juniper community in non-refugia sites (Rondeau et al. 2017).

6 Climate change will continue to effect aquatic ecosystems and to create vulnerabilities for human  
7 industries and activities dependent on the amount and timing of water supply, including  
8 agriculture/livestock grazing and recreation. Cattle grazing is an important socioeconomic  
9 activity in the Upper Arkansas River Valley, and grazing in the boundaries of the BCNM has  
10 occurred since the initiation of the 1934 Taylor Grazing Act. Vulnerabilities to livestock grazing  
11 from climate change include direct impacts from heat waves, resulting in reduced livestock  
12 health, and increased drought degrading forage quality and quantity, resulting in herd reductions  
13 and economic losses. Effects on agriculture are already occurring, for example the agriculture  
14 losses from the 2012 Colorado drought that were estimated at \$726 million (Pritchett et al.  
15 2013).

16 Recreational activities in the BCNM are also vulnerable to climate change effects. Wildfires can  
17 restrict recreational activities by impairing air quality and degrading recreation settings,  
18 including scenic resources. These effects could result in reduced tourism and related revenue for  
19 local communities around the BCNM. Commercial rafting, a key economic driver in the Upper  
20 Arkansas River Valley, could also be affected by earlier and shorter runoff seasons, as well as by  
21 drought conditions that affect in-stream flows in the Arkansas River during the peak summer  
22 rafting season. Reduced stream flows and rising water temperatures are also likely to reduce  
23 suitable habitat for coldwater fisheries, increasing the vulnerability of the Gold Medal Status  
24 trout fishery on the Arkansas River through the BCNM.

#### 25 **2.1.2.5 Existing Management Direction**

26 Prior to BCNM's designation, permitted activities that could result in emissions or climate  
27 change effects were managed under the 1996 RGRMP and 1984 Pike – San Isabel Forest Plan.  
28 Table lists additional relevant, existing Federal, state, and local management direction and  
29 guidance for climate change in the BCNM.

#### 30 **BLM Royal Gorge Resource Area RMP (Eco-Subregion 1, Arkansas River)**

31 No management direction specific to climate change was included in the RMP. Management  
32 directions for other resource uses that could affect climate change (e.g., recreation) are addressed  
33 in their respective sections.



1 **USFS Pike-San Isabel Forest Plan**

2 No management direction specific to climate change was included in the Forest Plan.  
3 Management directions for other resource uses that could affect climate change (e.g., recreation)  
4 are addressed in their respective sections.

5 **2.1.2.6 Needs for Change and Management Opportunities**

6 Needs for change and management opportunities addressing the effects of climate change to  
7 resources and resource uses in the BCNM are addressed in their respective sections of this  
8 Planning Assessment.

9 **2.1.3 Geology and Minerals**

10 Geological information, including studies of rock strata and their formation processes, can be  
11 used to assess an area's geological history, potential for mineral development, and natural hazard  
12 potential. The BCNM contains a wide variety of distinctive geological features that contribute to  
13 the Monument's scenic values and cultural history, provide opportunities for geological research  
14 and public interpretation, and contain a diverse assemblage of invertebrate fossils. Additionally,  
15 several natural hazards and abandoned mine lands within the BCNM raise public health and  
16 safety concerns. Increased visitation to the BCNM could have detrimental impacts to sensitive  
17 geological features, but also presents opportunities for the public to learn about geological  
18 processes contributing to the formation of Browns Canyon. The proposed BCNM Master Plan  
19 EIS will evaluate management strategies for maintaining the integrity of the Monument's  
20 geologic resources and minimizing risks from natural hazards.

21 Although mineral development has occurred historically in some areas of the BCNM and  
22 adjacent lands, restrictions associated with the area's designation as a national monument  
23 preclude all future mineral development except for pre-existing rights associated with four  
24 active, unpatented placer claims in the western portion of the BCNM. Based on BLM's current  
25 interpretation of the Proclamation, locatable mineral entry is also allowed in the WSA portion of  
26 the BCNM (subject to non-impairment criteria in BLM Manual 6330). In addition, several  
27 locations within the BCNM are used by the public for recreational mineral collection activities,  
28 most notably gold panning in the Arkansas River corridor and garnet collection at the Ruby  
29 Mountain site located within the overlapping WSA. Recreational mineral collection in the WSA  
30 portion of the BCNM is currently allowed (subject to non-impairment criteria in BLM Manual  
31 6330). The proposed BCNM MP-EIS will consider management strategies to minimize impacts  
32 from potential future development of active mineral claims and clarify suitable areas and types of  
33 recreation mineral collection.

34 ROVs for geology and minerals in the BCNM are identified in Proclamation 9232. Per the  
35 Proclamation, the area contains a wide variety of unusual geology which includes rugged granite  
36 cliffs, colorful rock outcroppings, 1.6 billion year-old Precambrian granodiorite batholith, the  
37 northernmost valley in the Rio Grande Rift system, relative wealth of Pennsylvania age

1 exposures of the Minturn formation and Belden shale which include a diverse assemblage of  
2 invertebrate fossils.

3 Planning issues and management concerns based on Proclamation 9232 and additional agency  
4 concerns include:

- 5 • How can BLM mitigate disturbance from mineral validity exam and prospecting (<5  
6 acres) on existing mineral claims, and how can BLM mitigate any development of  
7 mineral claims?
- 8 • How does BLM and USFS manage and mitigate adverse ROV effects of historic  
9 recreational mineral use, while providing local, regional, and interstate geology and  
10 geological science experiences and outcomes?
- 11 • How does BLM interpret recreational mineral collection, NCLS and mineral law-policy  
12 interpretation, perform monument ROV management duty and complexity?
- 13 • What decisions are necessary to mitigate resource impacts resulting from historic  
14 recreational mineral use?
- 15 • How does BLM provide for regional and interstate experiential geology and geological  
16 science values and experience, interpret mineral law-policy, recreational mineral  
17 collection policy, and protect monument resources?
- 18 • How does BLM and USFS respond to garnet collection and unmitigated soil health  
19 effects, expansion of social garnet collection trails and quarries, accelerated soil erosion,  
20 down drainage impacts, public-private property boundary concerns?
- 21 • How does BLM perform required mineral validity exams, address tribal area of potential  
22 effects, tribal cultural resource values, NHPA eligible cultural and religious site effects,  
23 cultural ROV protections?

#### 24 **2.1.3.1 Assessment Area**

25 The geographic area considered for characterizing conditions and trends of geological and  
26 mineral resources is the BCNM boundary.

#### 27 **2.1.3.2 Best Available Scientific Information**

28 Best available scientific information for geology and minerals in the assessment area consists of  
29 the following planning documents and agency reports and geological maps and data, mineral  
30 resource assessments, and mineral rights and development data.

1 **Geological Maps and Reports**

- 2 Kellog, K.S., Shroba, R.R., Ruleman, C.A., Bohannon, R.G., McIntosh, W.C., Premo, W.R.,  
3 Cosca, M.A., Moscati, R.J., and T.R. Brandt. 2017. Geologic Map of the Upper Arkansas  
4 River Valley Region, North-Central Colorado. U.S. Geological Survey Scientific  
5 Investigations Map 3382, pamphlet 70 p., 2 sheets, scale 1:50,000. Available:  
6 <https://doi.org/10.3133/sim3382>.
- 7 Colorado Geological Survey. 2018. Chaffee County Historical Mining Districts Map. Available:  
8 [http://coloradogeologicalsurvey.org/mineral-resources/historic-mining-districts/chaffee-](http://coloradogeologicalsurvey.org/mineral-resources/historic-mining-districts/chaffee-county/)  
9 [county/](http://coloradogeologicalsurvey.org/mineral-resources/historic-mining-districts/chaffee-county/). Accessed: January 9, 2018.
- 10 Dunn, Lisa G. 2015. Colorado Mining Districts A Reference. Available:  
11 [https://dspace.library.colostate.edu/bitstream/handle/11124/170391/Thesaurus-revised-2015-](https://dspace.library.colostate.edu/bitstream/handle/11124/170391/Thesaurus-revised-2015-with-cover.pdf?sequence=1)  
12 [with-cover.pdf?sequence=1](https://dspace.library.colostate.edu/bitstream/handle/11124/170391/Thesaurus-revised-2015-with-cover.pdf?sequence=1). Accessed: January 9, 2018.
- 13 Keller, J.W., McCalpin, J.P., and B.W. Lowry. 2004. Geologic Map of the Buena Vista East  
14 Quadrangle, Chaffee County, Colorado. Colorado Geological Survey, Open-File Report  
15 OF04-04, scale 1:24,000.
- 16 Light detection and ranging (LiDAR) data available through the Colorado Hazard Mapping and  
17 Risk MAP Portal:  
18 <http://coloradohazardmapping.com/Lidar>. <http://coloradohazardmapping.com/Lidar>.
- 19 Scott, G.R., Van Alstine, R.E., and W.N. Sharp. 1975. Geologic map of the Poncha Springs  
20 quadrangle, Chaffee County, Colorado. U.S. Geological Survey, Miscellaneous Field Studies  
21 Map MF-658, scale 1:62,500.
- 22 Wallace, C.A., and A.D. Lawson. 2008. Geologic Map of the Cameron Mountain Quadrangle,  
23 Chaffee, Fremont and Park Counties, Colorado. Colorado Geological Survey, Open-File  
24 Report OF-08-12, scale 1:24,000.
- 25 Wallace, C.A., and J.W. Keller. 2003. Geologic Map of the Castle Rock Gulch Quadrangle,  
26 Chaffee and Park Counties, Colorado. Colorado Geological Survey, Open-File Report OF-01-  
27 01, scale 1:24,000.

28 **Mineral Resource Assessments**

- 29 BLM. Mineral Potential Report for the Royal Gorge Field Office. Pending completion and  
30 publication.
- 31 Leibold, A.M., Detra, D.E., and J.M. Motooka. 1987. Geochemical Evaluation of the Mineral  
32 Resources of the Browns Canyon Area, Chaffee County, Colorado. U.S. Geological Survey,  
33 Open-File Report OF-87-508, scale 1:24,000.

- 1 Leibold, A.M., Worl, R.G., Martin, R.A., and J.E. Zelten. 1986. Mineral resources of the Browns  
2 Canyon Wilderness Study Area, Chaffee County, Colorado. U.S. Geological Survey, Bulletin  
3 1716-C, scale 1:24,000.
- 4 Van Alstine, R.E., and D.C. Cox. 1969. Geology and mineral deposits of the Poncha Springs NE  
5 quadrangle, Chaffee County, Colorado with a section on fluorspar mines and prospects. U.S.  
6 Geological Survey, Professional Paper 626, scale 1:24,000.

### 7 **Mineral Rights and Development Data**

- 8 Geospatial datasets from the BLM Colorado State Office containing the following information  
9 extracted from BLM's LR2000 database: active and closed mining claim records, mineral  
10 material disposal sites, authorized and pending oil and gas leases, authorized and pending oil and  
11 gas geophysical permits, oil shale leases, and solid non-energy leasable mineral records.  
12 Available via ArcGIS REST Services Directory at: <https://gis.blm.gov/coarcgis/services>.  
13 Accessed January 5, 2018.
- 14 Colorado Abandoned Mine Land Information. Available: <https://erams.com/map/>. Accessed  
15 February 7, 2018.
- 16 Colorado Division of Reclamation, Mining and Safety Mapping Application. Available at:  
17 <https://www.coloradodnr.info/H5V/Index.html?viewer=drms>. Accessed January 5, 2018.
- 18 Colorado Geological Survey. U.S. Forest Service Abandoned Mine Land Inventory Project  
19 ArcGIS Geodatabase. Available at: [http://coloradogeologicalsurvey.org/water/abandoned-](http://coloradogeologicalsurvey.org/water/abandoned-mine-land/united-states-forest-hazard-abandoned-mine-land-inventory-project/)  
20 [mine-land/united-states-forest-hazard-abandoned-mine-land-inventory-project/](http://coloradogeologicalsurvey.org/water/abandoned-mine-land/united-states-forest-hazard-abandoned-mine-land-inventory-project/). Accessed  
21 January 5, 2018.
- 22 Colorado Oil and Gas Conservation Commission Interactive Map. Available at:  
23 [https://cogccmap.state.co.us/cogcc\\_gis\\_online/](https://cogccmap.state.co.us/cogcc_gis_online/). Accessed January 5, 2018
- 24 U.S. Geological Survey Mineral Resources Data System. Available at:  
25 <https://mrddata.usgs.gov/mrds/>. Accessed January 5, 2018.

### 26 **2.1.3.3 Limitations/Data Gaps**

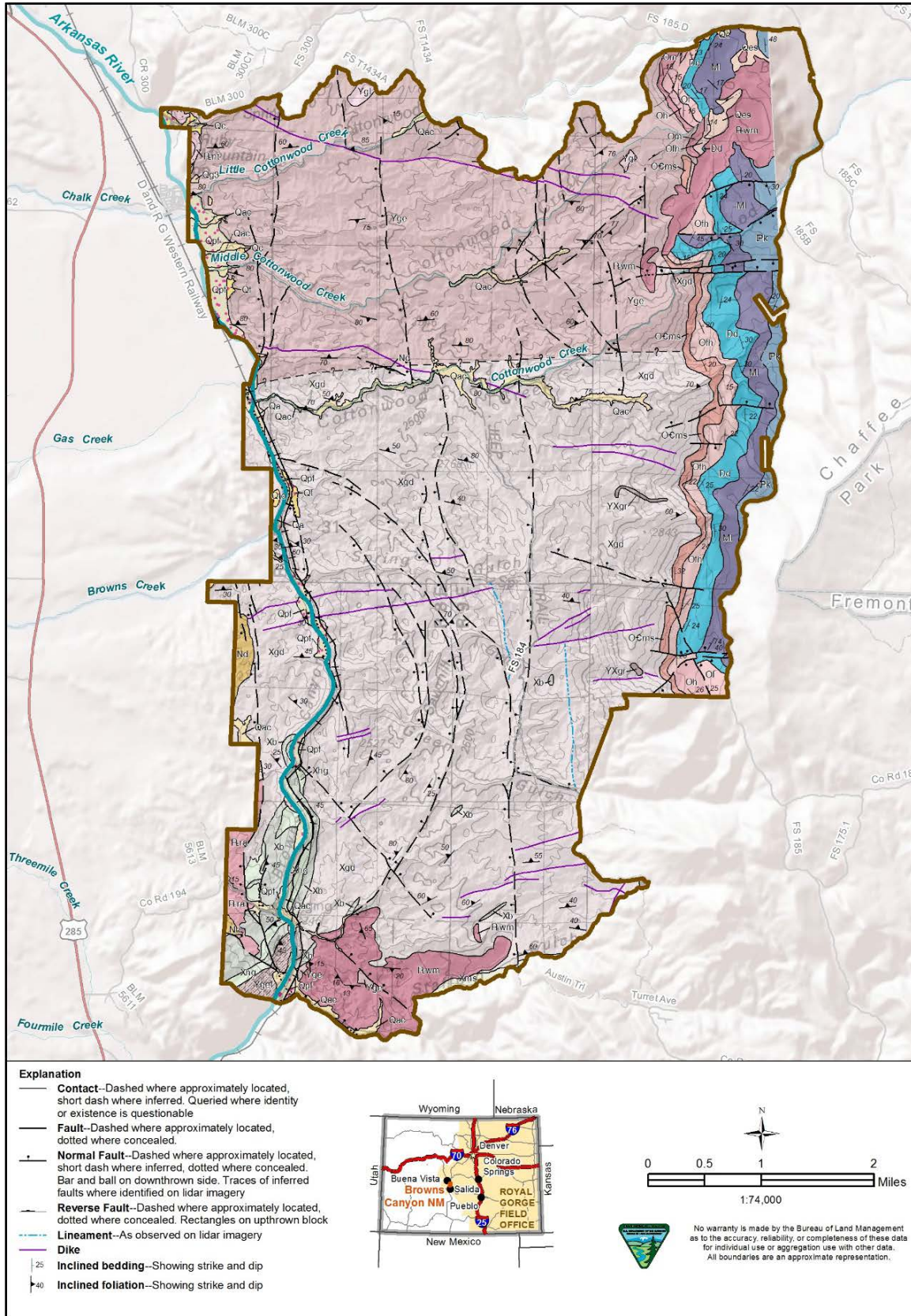
- 27 Although geological information is available from existing reports and maps, geological features  
28 of scientific, cultural, and scenic value within the BCNM have not been comprehensively  
29 inventoried. This assessment relies on information available in existing reports and maps; no  
30 field studies were conducted. Use of LiDAR data identified above may be suitable for  
31 developing high resolution maps of surficial geological features for a large portions of the  
32 BCNM for which the data are available; however, such products were not readily available at the  
33 time this planning assessment was prepared.
- 34 Other data gaps and limitations are listed below:

- 1       • Locations of natural hazards within the BCNM, including areas where the visitors may  
2       encounter objective hazards from rockfall, landslides, and flash floods.
- 3       • Usage data and mapping of recreational mineral collection activities within the BCNM,  
4       particularly for garnet collection and associated social trails at Ruby Mountain.

5   **2.1.3.4   Existing Conditions and Trends**

6   **Geology**

7   The BCNM is located within the Arkansas River Valley on the western flank of the Mosquito  
8   Range, at the eastern edge of the Colorado Mineral Belt. The terrain is rugged with elevations  
9   ranging from 7,300 feet to 10,000 feet and an abundance of rock outcrops. Figure 2-6 a 1:50,000-  
10   scale USGS geological map of the BCNM that represents the most recent and complete  
11   geological dataset available for the Monument area (Kellog et al. 2017). Table 2-3 reports the  
12   acreage associated with each formation depicted on the map. Mapped geologic types consist  
13   primarily of Quaternary alluvial deposits along the Arkansas River and tributaries; widespread  
14   intrusive Proterozoic granite formations; Paleozoic sedimentary rock sequences of dolomite,  
15   sandstone, and limestone along the eastern edge of the BCNM, and deposits of Eocene volcanic  
16   tuff in the south and northeast portions of the BCNM.



1  
2

Figure 2-6 Geological Formations in Browns Canyon National Monument

**Geological Formations within the National Monument Boundary  
Browns Canyon National Monument**

<b>LIST OF MAP UNITS</b>	
<p style="text-align: center;"><b>SURFICIAL DEPOSITS</b></p> <p style="text-align: center;"><b>ALLUVIAL DEPOSITS</b></p> <p> Qa - Young stream-channel and overbank alluvium (Holocene)</p> <p> Qpf - Younger flood gravel and channel deposits of Pinedale glaciation (late Pleistocene)</p> <p> Qg3 - Outwash gravel of pre-Bull Lake age, level 3 (middle Pleistocene)</p> <p style="text-align: center;"><b>ALLUVIAL AND MASS-MOVEMENT DEPOSITS</b></p> <p> Qf - Fan deposits (Holocene and late Pleistocene)</p> <p> Qac - Alluvium and colluvium, undivided (Holocene to middle? Pleistocene)</p> <p> Qfo - Old fan deposits (late and middle Pleistocene)</p> <p style="text-align: center;"><b>EOLIAN AND ALLUVIAL DEPOSITS</b></p> <p> Qes - Eolian sediments and alluvium, undivided (Holocene to middle? Pleistocene)</p> <p style="text-align: center;"><b>Basin-Fill Deposits</b></p> <p> Nd - Dry Union Formation (lower Pliocene? and Miocene)</p> <p style="text-align: center;"><b>Mass-Movement Deposits</b></p> <p> Qc - Colluvium (Holocene to middle? Pleistocene)</p> <p style="text-align: center;"><b>OLIGOCENE AND EOCENE VOLCANIC AND MIXED VOLCANIC, VOLCANICLASTIC, AND SEDIMENTARY ROCKS</b></p> <p style="text-align: center;"><b>VOLCANIC ROCKS ASSOCIATED WITH EARLY RIO GRANDE RIFTING</b></p> <p> F<sub>enr</sub> - Topaz rhyolite flow of Nathrop Volcanics, including basal vitrophyre (lower Oligocene)</p> <p> F<sub>ent</sub> - Tuff and tuffaceous breccia of Nathrop Volcanics (lower Oligocene)</p> <p style="text-align: center;"><b>PRE-DRIFT VOLCANIC, VOLCANICLASTIC, AND SEDIMENTARY ROCKS</b></p> <p> F<sub>wm</sub> - Wall Mountain Tuff (upper Eocene)</p> <p> F<sub>era</sub> - Rhyodacite porphyry flow, ash, and mud-flow deposit of Van Alstine and Cox (1969) (upper or middle Eocene)</p>	<p style="text-align: center;"><b>PALEOZOIC SEDIMENTARY ROCKS</b></p> <p> IPk - Kerber Formation (Lower Pennsylvanian)</p> <p> MI - Leadville Limestone (Lower Mississippian)</p> <p> Dd - Dyer Dolomite (Lower Mississippian? and Upper Devonian)</p> <p> Ofh - Fremont Dolomite and Harding Sandstone, undivided (Upper and Middle Ordovician)</p> <p> Of - Fremont Dolomite (Upper Ordovician)</p> <p> Oh - Harding Sandstone (Middle Ordovician)</p> <p> Om - Manitou Dolomite, upper part (Lower Ordovician)</p> <p> O<sub>cm</sub>s - Manitou Dolomite and Sawatch Quartzite, undivided (Lower Ordovician and Upper Cambrian)</p> <p style="text-align: center;"><b>PROTEROZOIC ROCKS</b></p> <p style="text-align: center;"><b>INTRUSIVE ROCKS</b></p> <p> YXgr - Granitic rock, undivided (Mesoproterozoic or Paleoproterozoic)</p> <p> Ygl - Langhoff Gulch Granite (Mesoproterozoic)</p> <p> Yge - Elephant Rock Granite (Mesoproterozoic)</p> <p> Ygef - Elephant Rock Granite, strongly foliated facies (Mesoproterozoic)</p> <p> Xgd - Henry Mountain? Granite (Paleoproterozoic)</p> <p style="text-align: center;"><b>PALEOPROTEROZOIC ROCKS OF THE GUNNISON-SALIDA VOLCANO-PLUTONIC BELT</b></p> <p> Xms - Aluminous gneiss and schist, calc-silicate gneiss, and quartzite (Paleoproterozoic)</p> <p style="text-align: center;"><b>METASEDIMENTARY AND METAIGNEOUS ROCKS</b></p> <p> Xb - Biotite gneiss (Paleoproterozoic)</p> <p> Xhg - Hornblende gneiss and amphibolite (Paleoproterozoic)</p>

**1 Table 2-3 Geological Formations in Browns Canyon National Monument**

General Type	Formation Label	Formation <sup>1</sup>	Acres
<b>Surficial Deposits</b>			
Alluvial Deposits	Qa	Young stream-channel and overbank alluvium (Holocene)	3
	Qpf	Younger flood gravel and channel deposits of Pinedale glaciation (late Pleistocene)	275
	Qg3	Outwash gravel of pre-Bull Lake age, level 3 (middle Pleistocene)	4
Alluvial and Mass-Movement Deposits	Qf	Fan deposits (Holocene and late Pleistocene)	43
	Qac	Alluvium and colluvium, undivided (Holocene to middle? Pleistocene)	290
	Qfo	Old fan deposits (late and middle Pleistocene)	6
Mass-Movement Deposits	Qc	Colluvium (Holocene to middle? Pleistocene)	13
Eolian and Alluvial Deposits	Qes	Eolian sediments and alluvium, undivided (Holocene to middle? Pleistocene)	72
Basin-Fill Deposits	Nd	Dry Union Formation (lower Pliocene? and Miocene)	72
<b>Oligocene and Eocene Volcanic and Mixed Volcanic, Volcaniclastic, and Sedimentary Rocks</b>			
Volcanic Rocks Associated with Early Rio Grande Rifting	Penr	Topaz rhyolite flow of Nathrop Volcanics, including basal vitrophyre (lower Oligocene)	5
	Pent	Tuff and tuffaceous breccia of Nathrop Volcanics (lower Oligocene)	21
Pre-rift Volcanic, Volcaniclastic, and Sedimentary Rocks	Pewm	Wall Mountain Tuff (upper Eocene)	967
	Pera	Rhyodacite porphyry flow, ash, and mud-flow deposit of Van Alstine and Cox (1969) (upper or middle Eocene)	118
<b>Paleozoic Sedimentary Rocks</b>			
	Pk	Kerber Formation (Lower Pennsylvanian)	287
	Ml	Leadville Limestone (Lower Mississippian)	662
	Dd	Dyer Dolomite (Lower Mississippian? and Upper Devonian)	586
	Ofh	Fremont Dolomite and Harding Sandstone, undivided (Upper and Middle Ordovician)	351
	Of	Fremont Dolomite (Upper Ordovician)	71
	Oh	Harding Sandstone (Middle Ordovician)	83
	Om	Manitou Dolomite, upper part (Lower Ordovician)	47
	OCms	Manitou Dolomite and Sawatch Quartzite, undivided (Lower Ordovician and Upper Cambrian)	232
<b>Proterozoic Rocks</b>			
Intrusive Rocks	YXgr	Granitic rock, undivided (Mesoproterozoic or Paleoproterozoic)	16
	Ygl	Langhoff Gulch Granite (Mesoproterozoic)	30
	Yge	Elephant Rock Granite (Mesoproterozoic)	5,599
	Ygef	Elephant Rock Granite, strongly foliated facies (Mesoproterozoic)	70
	Xgd	Henry Mountain? Granite (Paleoproterozoic)	10,792



Paleoproterozoic Rocks of the Gunnison-Salida Volcano-Plutonic Belt	Xms	Aluminous gneiss and schist, calc-silicate gneiss, and quartzite (Paleoproterozoic)	39
Metasedimentary and Metaigneous Rocks	Xb	Biotite gneiss (Paleoproterozoic)	324
	Xhg	Hornblende gneiss and amphibolite (Paleoproterozoic)	155
<b>Other</b>			
Water	w	-	62
No Data <sup>2</sup>	-	-	310
<b>Total</b>			<b>21,604</b>

1 Source: Kellog et al. 2017

2 <sup>1</sup> Question marks denote uncertainties in the age or type of formation present.

3 <sup>2</sup> Approximately 310 acres in the northeast portion of the BCNM is located outside the geological dataset prepared by Kellog et  
 4 al. 2017. The Geologic Map of the Castle Rock Gulch Quadrangle indicates that this area consists primarily of the upper Eocene  
 5 Wall Mountain Tuff formation and early Pennsylvania Kerber Formation (Wallace and Keller 2003).

6 **Historical Mineral Development**

7 Mineral development has occurred historically in the vicinity of Browns Canyon and in various  
 8 locations along the Arkansas River corridor, including several mines and prospecting sites within  
 9 the BCNM (Liebold et al. 1986). Four historic mining districts extend into the BCNM  
 10 boundary—the Brown’s Canyon Fluorspar District, the Turret Mining District, Arkansas River  
 11 Placers, and Browns Creek Placers (Colorado Geological Survey 2018). The Browns Canyon  
 12 Fluorspar District extends into the southwestern corner of the BCNM. This district was once one  
 13 of the highest producing fluorspar districts in the U.S., producing about 130,000 tons of fluorspar  
 14 between 1927 and 1949 (Van Alstine and Cox 1969). The Turret Mining District extends along  
 15 the southeastern boundary of the BCNM. This district was mined extensively for copper, gold,  
 16 silver, iron, pegmatite and other minerals with production peaking in 1900 (Dunn 2015). From  
 17 the late 1800s until the 1930s, limited quantities of gold were produced intermittently from  
 18 placer deposits along the Arkansas River and its tributary, Browns Creek (Dunn 2015). Several  
 19 quarries and prospects for minerals such as perlite, quartzite, vermiculite, and pegmatite are also  
 20 present in the Monument (Liebold, Detra, and Motooka 1987).

21 **Mineral Development Potential**

22 Existing studies indicate a low potential for undiscovered mineral and geothermal resources, and  
 23 no potential for development of oil and gas resources within the BCNM WSA and the adjacent  
 24 Brown’s Canyon Fluorspar District and the western portion of the Turret Mining District  
 25 (Liebold et al. 1986; Liebold, Detra, and Motooka 1987). Based on the types of geologic units  
 26 present in other portions of the BCNM, these areas likely have similar or lower potential to  
 27 contain undiscovered mineral resources.

28 There are currently four known active mining claims within the BCNM and the Browns Canyon  
 29 WSA—placer claims spanning the Arkansas River southeast of Nathrop (BLM 2018)—which  
 30 were filed in 2012 prior to Browns Canyon’s designation as a national monument and associated  
 31 withdrawal from mineral entry. Provided these claims remain active, they could be used for

1 mineral prospecting, exploration, development, and extraction activities so long as all reasonable  
2 efforts are made to meet non-impairment criteria and prevent unnecessary and undue degradation  
3 pursuant to 43 CFR 3802 and 3809. There are currently no other known active mining claims,  
4 mineral material disposal sites, or fluid or solid mineral leases within the BCNM (BLM 2018);  
5 per Proclamation 9232, all future mineral leases are precluded, and future mining claims are only  
6 allowed inside the WSA portion of the BCNM.

### 7 **Recreational Mineral Collection**

8 BLM and USFS regulations allow the public to conduct certain types of casual use or  
9 recreational mineral collection (in limited quantities and for non-commercial purposes) on  
10 Federal lands outside of existing claims without prior notification or approval. Although no data  
11 exist on recreational mineral collection areas and usage specifically within the BCNM, interest in  
12 recreational gold placering has been observed in the region (DOI and CPW 2017; BLM 2015).  
13 Common recreational mineral collection activities may include gold placering in the Arkansas  
14 River and Browns Creek via panning or sluicing, as well as rockhounding throughout the  
15 Monument. Garnet and gemstone collection is heavily concentrated at Ruby Mountain, and has  
16 resulted in a proliferation of social trails that exacerbate soil erosion. Recreational mineral  
17 collection is allowed in the WSA portion of the BCNM.

### 18 **Abandoned Mine Lands and Natural Hazards**

19 An inventory of abandoned mine features on USFS-administered lands conducted by the  
20 Colorado Geological Survey (2018) identified several abandoned mines within and adjacent to  
21 the BCNM. Abandoned mine features, some of which were classified as potentially hazardous,  
22 included dilapidated buildings, prospecting holes, open pits, mine adits, and mine shafts within  
23 three sites within and along the southwestern and western Monument boundary: Green Gulch,  
24 the Reef, and Conns Park. The Colorado Abandoned Mine Land Information website (2018)  
25 identifies additional abandoned mine features on BLM lands, including prospect pits, waste rock  
26 dumps, and adits in the vicinity of Hecla Junction, along the River Access Trail, and south of  
27 Ruby Mountain. The primary natural hazards within the BCNM are rockfall, landslides, and  
28 flash floods. Hazard areas have not been inventoried, but in general are most likely to occur in  
29 steep-sided canyons, on steep slopes, and beneath cliff faces.

#### 30 **2.1.3.5 Existing Management Direction**

##### 31 **Proclamation 9232**

- 32 • Recognizes the BCNM’s “unusual geology” and “scientifically significant geological  
33 resources” as objects of value; however, there is no existing management direction  
34 specific to geological resources for lands within the BCNM.

- 1       • Declares BCNM as “withdrawn from all forms of entry, location, selection, sale, leasing,  
2       or other disposition under the public land laws or laws applicable to the U.S. Forest  
3       Service, including location, entry, and patent under the mining laws, and from disposition  
4       under all laws relating to mineral and geothermal leasing, other than by exchange that  
5       furthers the protective purposes of the monument.”

6       **BLM Royal Gorge Resource Area RMP (Eco-Subregion 1, Arkansas River)**

- 7       • Does not provide specific management direction for geological resources applicable to  
8       the .
- 9       • Management direction for minerals have been superseded by direction listed above for  
10      Proclamation 9232.
- 11      • Potential development and reclamation of active placer claims through exercise of valid  
12      existing rights would be subject to the mining laws, BLM surface management  
13      regulations, and BLM management of WSAs; RMP management direction is not likely to  
14      apply.

15      **USFS Pike – San Isabel Forest Plan**

- 16      • Does not provide specific management direction for geological resources applicable to  
17      the BCNM.
- 18      • Management direction for minerals has been superseded by direction listed above for  
19      Proclamation 9232.

20      Table 1-2 lists additional relevant, existing Federal, state, and local management direction and  
21      guidance for geological resources in BCNM.

22      **2.1.3.6 Needs for Change and Management Opportunities**

23      Given the resource conditions, trends and existing management, Table 2-4 summarizes needs for  
24      change and management opportunities to consider in the MP.

25      **Table 2-4 Needs for Change and Management Opportunities for Geology and Minerals**

Need for Change	Management Opportunities
The BCNM contains numerous geological features that contribute to its ROVs; these features have not been systematically inventoried.	Inventory and assess BLM and USFS parcels to identify distinctive or sensitive geological features that may warrant consideration for protective management and public interpretation.
Increased visitation and interest in the BCNM will increase demand for readily available information about the area’s geological history.	Directly or in collaboration with partner organizations, provide interpretive opportunities and media (e.g., tours, signs, pamphlets) to enhance visitor experiences and their understanding and appreciation of the BCNM’s geologic features and history.
Increased visitation and interest in the BCNM will increase human contact with	Limit public access or activities in areas where sensitive geological features could be damaged or defaced by recreational use (e.g.,

geological features.	installation of fixed anchors on climbing routes, erosion from development of unsustainable social trails).
Increased visitation and interest in the BCNM will increase human contact with geological features.	Limit public access and post warning signs in areas where conditions present objective hazards (e.g., rock fall, landslides, flooding) to BCNM visitors.
Four active placer claims exist within the BCNM that could be developed under the mining laws.	Evaluate strategies to minimize or mitigate potential adverse environmental and use conflicts from potential future development of active placer claims within the BCNM.
Expansion of uncontrolled social trails in the garnet collection area at Ruby Mountain near the north entrance to the Monument have contributed to erosion and visual degradation.	Consider alternatives that prohibit garnet collection in the BCNM or allow collection for experiential or scientific purposes with prior authorization.  Seek academic partnerships to help manage the recreational collection, develop, and monitor mitigation approaches, and expand educational and science outreach.

1    **2.1.4    Paleontological Resources**

2    Paleontological resources are known to exist within BCNM. Paleontological resources comprise  
3    the fossil record of past life forms, which include bones and teeth, soft tissues, shell, wood, leaf  
4    impressions, footprints, burrows, or other traces and remains contained within rock layers.

5    Paleontological resources are integrally associated with geological rock units in which they are  
6    located, therefore, geological and mineral information and management are considered in the  
7    description and analysis of paleontological resources. The fossil record in the Arkansas Valley  
8    ranges from the Upper Cambrian Period to the end of the Pleistocene Epoch representing  
9    approximately 520 million years (BLM 2015a). Once damaged, destroyed, or improperly  
10    collected the scientific and educational value of paleontological resources may be greatly  
11    reduced. Natural weathering, erosion, improper collection, and vandalism can alter the  
12    characteristics that make a paleontological resource important for scientific use.

13    ROVs for paleontological resource include the following:

- 14        • Portions of the Browns Canyon area offer a relative wealth of Pennsylvanian age  
15        geologic exposures of the Minturn formation and Belden shale that include a diverse  
16        assemblage of invertebrate fossils. These sites represent the accumulation of shell fossils  
17        in an ancient reef environment, and include remains of bivalves, brachiopods, gastropods,  
18        echinoids, nautiloids, conodonts, crinoids, bryozoans, and vertebrates including sharks  
19        and bony fish. Many of the fossil forms remain undescribed and will form the basis for  
20        future paleontological research.
- 21        • The geologic record shows that the plant community in this area has repeatedly evolved  
22        during periods of climate change since the Eocene Epoch. Geologic and climatic changes  
23        since the Precambrian have made the area an important site for research on geology and  
24        paleoecology as well as the effects of climate change, wildland fire, and other  
25        disturbances on plant and animal communities.

1 Planning issues and management concerns based on Proclamation 9232 and additional agency  
2 concerns include:

- 3 • How should scientific research be conducted if determined to be appropriate through the  
4 planning process?
- 5 • What is the appropriate mix between information/education and protection/preservation  
6 for the paleontological resources in this area?
- 7 • How will current and future change agents or drivers such as development in Chaffee  
8 County, climate change, invasive species, fire, and changes in recreational use and  
9 pressure affect monument cultural and paleontological ROVs in the period 2021–2035?
- 10 • How does management plan address paleontological science and unauthorized resource  
11 collection?

#### 12 **2.1.4.1 Assessment Area**

13 The geographic area considered for characterizing conditions and trends of geological, mineral,  
14 and paleontological ROVs will be the BCNM boundary.

#### 15 **2.1.4.2 Best Available Scientific Information**

16 36 CFR 214, 261, and 291. 2015. Forest Service Final Rule for Paleontological Resources  
17 Preservation. A Rule by the Forest Service on April 17, 2015. Available online at:  
18 [https://www.federalregister.gov/documents/2015/04/17/2015-08483/paleontological-](https://www.federalregister.gov/documents/2015/04/17/2015-08483/paleontological-resources-preservation)  
19 [resources-preservation](https://www.federalregister.gov/documents/2015/04/17/2015-08483/paleontological-resources-preservation).

20 43 CFR. 49. 2017. Department of the Interior. Proposed Rule for Paleontological Resources  
21 Preservation. Available online at:  
22 [https://www.federalregister.gov/documents/2016/12/07/2016-29244/paleontological-](https://www.federalregister.gov/documents/2016/12/07/2016-29244/paleontological-resources-preservation)  
23 [resources-preservation](https://www.federalregister.gov/documents/2016/12/07/2016-29244/paleontological-resources-preservation).

24 C.R.S. 24-80-401 to 410; 1308a and b. 1973. Historical, Prehistorical, and Archaeological  
25 Resources Act of 1973. Available online at:  
26 [http://legacy.historycolorado.org/sites/default/files/files/OAHP/crforms\\_edumat/pdfs/1308a.p](http://legacy.historycolorado.org/sites/default/files/files/OAHP/crforms_edumat/pdfs/1308a.pdf)  
27 [df](http://legacy.historycolorado.org/sites/default/files/files/OAHP/crforms_edumat/pdfs/1308a.pdf).

28 BLM. 1998. General Procedural Guidance for Paleontological Resource Management. BLM  
29 Manual Handbook 8270-1. 32 pp.

30 BLM. 2009. Assessment and Mitigation of Potential Impacts of Paleontological Resources. BLM  
31 IM 2009-011. Available online at: [https://blm-prod.opengov.ibmcloud.com/policy/im-2009-](https://blm-prod.opengov.ibmcloud.com/policy/im-2009-011)  
32 [011](https://blm-prod.opengov.ibmcloud.com/policy/im-2009-011).

33 BLM. 2015a. Paleontological Resource Overview of the Royal Gorge Field Office Planning Area.  
34 Prepared for the U.S. Department of the Interior, Bureau of Land Management, Royal Gorge  
35 Field Office. July, 2015.

1 BLM. 2015b. Eastern Colorado Analysis Management Situation. U.S. Department of the Interior,  
2 Bureau of Land Management.

3 BLM. 2016. Instruction Memorandum No. 2016-124, Potential Fossil Yield Classification  
4 (PFYC) System for Paleontological Resources on Public Lands. BLM IM 2016-124.  
5 Washington, D.C. July 8, 2016. Available online at: [https://www.blm.gov/policy/im-2016-](https://www.blm.gov/policy/im-2016-124)  
6 124.

7 Public Law 111-11, Title VI, Subtitle D. 2016. Paleontological Resources Preservation Act.  
8 Available online at: [https://www.federalregister.gov/documents/2016/12/07/2016-](https://www.federalregister.gov/documents/2016/12/07/2016-29244/paleontological-resources-preservation)  
9 29244/paleontological-resources-preservation.

10 Smeins, M. 2017. Personal communication with J. Wheaton regarding PFYC in the BCNM.  
11 January 3, 2017

## 12 **GIS Data**

- 13 • BLM. 2017. PFYC and Bedrock Geology Data in the Brown's Canyon National  
14 Monument. U.S. Department of the Interior, Bureau of Land Management Accessed  
15 2017.

16 Table 1-2 also lists relevant, existing Federal, state, and local management direction for  
17 paleontological resources in the BCNM.

### 18 **2.1.4.3 Limitations/Data Gaps**

19 Geologic units in BCNM are known, and relative abundance of significant vertebrate,  
20 invertebrate, or plant fossils and their sensitivity to disturbance can be predicted via the PFYC  
21 system. However, limited paleontological studies have been conducted in and around the BCNM  
22 area, and therefore the localities of significant resources in the monument are currently unknown

### 23 **2.1.4.4 Existing Conditions and Trends**

24 Paleontological resource potential is identified and classified using the BLM's PFYC system  
25 (BLM 2016) as well as databases of known fossil localities maintained by the BLM, USFS,  
26 USGS, Denver Museum of Nature and Science, and the University of Colorado Museum of  
27 Natural History. The probability of finding paleontological resources in an area can be broadly  
28 predicted by the type of geologic units present or near the surface. The PFYC system classifies  
29 geologic units based on the relative abundance of significant vertebrate, invertebrate, or plant  
30 fossils and their sensitivity to adverse impacts. The units are classified one through five in the  
31 PFYC system, with a class of five indicating the highest potential for that geologic unit to yield  
32 paleontological resources and a class of one indicating the lowest potential. Table 2-5  
33 summarizes the paleontological resource potential and sensitivity of geologic formations in  
34 BCNM. The fossils listed for each geologic unit are those likely to be found regionally in the  
35 unit; this list is not a guarantee that such fossils would be found in these geologic units where

1 they overlap BCNM. More specific information regarding paleontological resources in the  
 2 Arkansas Valley can be found in the BLM’s *Paleontological Resource Overview of the Royal*  
 3 *Gorge Field Office Planning Area* (BLM 2015a).

4 **Table 2-5 Paleontological Resources Potential within Browns Canyon National Monument**

Geologic Formation/Deposit	Age	PFYC	Common Fossils	Acres within BCNM	Percent within BCNM
Gravels and alluviums (Qg)	Pleistocene	3	Vertebrates including mammoth, bison, horse, camel, jackrabbit, ground squirrel, gopher, and prairie dogs	325.6	1.5%
Dry Union Formation (Td)	Late Miocene and Early Pliocene	4	Vertebrates including horse, mastodon, camel deer, and rabbit; invertebrates including bivalves, gastropods and ostracods; plants including cattail and locust	81.5	0.4%
Rhyolitic intrusive rocks and flows of late-volcanic bimodal suite (Tbr)	Miocene	1	None identified	28.2	0.1%
Ash-flow tuff of main volcanic sequence (Taf)	Upper Oligocene	1	None identified	144.2	0.7%
Wall Mountain Tuff (Twm)	Lower Oligocene	1	None identified	1,347.6	6.2%
Minturn and Belden Formations (PAmb)	Middle Pennsylvanian	3	Invertebrates including foraminifera, bryozoans, brachiopods, echinoderms, bivalves, corals, gastropods, and cephalopods; fish and shark teeth; conodonts	283.5	1.3%
Leadville Limestone, Williams Canyon Limestone, and one or more of: Fremont Limestone, Harding Sandstone, and Manitou Limestone (MDO)	Early and Middle Mississippian	3	Fish teeth; invertebrates including foraminifera, crinoids, corals, bivalves, bryozoans, brachiopods, and stromatolites	2,175.5	10.1%
Felsic and hornblende gneisses, either separate or interlayered (Xfh)	Precambrian	1	None identified	772.0	3.6%
Granitic rocks of 1700 million years age group (Xg)	Precambrian	1	None identified	16,445.7	76.1%
<b>Total</b>				<b>21,603.7</b>	<b>100%</b>

5 Table 2-6 provides the acreage and percent of each PFYC represented in the BCNM, the  
 6 majority of which is within PFYC 1, the class representing the lowest potential for  
 7 paleontological resources.

8

1 **Table 2-6 Acres of Paleontological Potential within the Browns Canyon National**  
 2 **Monument by PFYC**

PFYC Class	Acres within BCNM	Percent within BCNM
1	18,737.7	86.7%
3	2,784.5	12.9%
4	81.5	0.4%
<b>Total</b>	<b>21,603.7</b>	<b>100%</b>

Source: BLM 2017; Smeins 2017  
 BCNM Browns Canyon National Monument  
 PFYC Potential Fossil Yield Classification

3 Effects from permitted activities on paleontological resources have remained stable, as the trend  
 4 has been toward conservation through the application of mitigation and standard operating  
 5 procedures for federally-approved activities. As described in the ECRMP AMS, for activities not  
 6 subject to direct Federal management approval, the trend for paleontological resources has  
 7 moved away from desired conditions due to unauthorized collection of fossils, limited law  
 8 enforcement resources, ground disturbance associated with recreational activities, and natural  
 9 processes such as erosion (BLM 2015b).

10 Drivers and stressors for paleontological resources are:

- 11 • Surface disturbing activities such as mining, recreational facility development, and the  
 12 construction of roads lead to the potential discovery of paleontological resources that  
 13 could both cause inadvertent damage to the resource as well as led to an increase in  
 14 scientific knowledge regarding the resource.
- 15 • Increased public access and recreation use in BCNM could lead to an increase in illegal  
 16 fossil collection.

17 **2.1.4.5 Existing Management Direction**

18 Paleontological resources are managed under the 1996 RGRMP and 1984 Pike – San Isabel  
 19 Forest Plan.

20 **BLM Royal Gorge Resource Area RMP (Eco-Subregion 1, Arkansas River)**

21 No management direction specific to paleontological resources for the BCNM area was included  
 22 in the RMP. Management for other resource uses that could affect paleontological resources  
 23 (e.g., recreation) are addressed in their respective sections.

24 **USFS Pike – San Isabel Forest Plan**

25 No management direction specific to paleontological resources for the BCNM area was included  
 26 in the Forest Plan. Management for other resource uses that could affect paleontological  
 27 resources (e.g., recreation) are addressed in their respective sections.



1 Table 1-2 lists additional relevant, existing Federal, state, and local management direction and  
 2 guidance for paleontological resources in BCNM.

3 **2.1.4.6 Needs for Change and Management Opportunities**

4 Given the resource conditions, trends, and existing management in BCNM, Table 2-7  
 5 summarizes needs for change and management opportunities to consider in the BCNM MP.

6 **Table 2-7 Needs for Change and Management Opportunities for Paleontological Resources**

Needs for Change	Management Opportunities
The potential for increasing recreational use and visitation in BCNM following designation may lead to additional unauthorized fossil collection.	Inventory and assess BLM and USFS parcels individually to identify parcels with PFYC 4 and 5 geologic units in order to focus paleontological resource management efforts in these areas.  Use public awareness programs, targeted closures, and access restrictions to reduce the risk of unauthorized fossil collection in BCNM.  Continue current management and standard operating procedures for permitted activities to maintain desired conditions for paleontological resources.

7 **2.1.5 Soils and Watersheds**

8 This assessment describe conditions and trends BCNM soils and watersheds and emphasizes  
 9 perennial and intermittent streams as resources accessed most frequently by humans and animals,  
 10 including current management impacts.

11 BCNM is located within Major Land Resource Area 48B, Southern Rocky Mountain Parks. This  
 12 area is within the Southern Rocky Mountains Province of the Rocky Mountain System. It  
 13 consists of nearly level to rolling mountain parks and valleys and a few narrow mountain ridges.  
 14 It occurs as two separate parts in the center of the Southern Rockies. The elevation ranges from  
 15 7,850 to 10,850 feet above mean sea level (amsl).

16 Soil resources within the interior of BCNM have received minimal management, extraction,  
 17 exploration, or development due to inaccessibility since the mining period (1880-1940). Soil  
 18 conditions are driven by inaccessibility, minimal resource use, and no mineral extraction or  
 19 development since BLM land use decisions in 1996. Soils and watersheds are not specifically  
 20 identified as ROVs in the Proclamation, apart from “The Arkansas River valley, which attracts  
 21 visitors from around the world, and whose canyons, rivers, and backcountry forests have  
 22 provided a home for humans for over 10,000 years.”

23 Planning issues and management concerns based on Proclamation 9232 and additional agency  
 24 concerns include:

- 25 • What areas of especially fragile soils influencing riparian, spring and riverine system will  
 26 need special attention?
- 27 • What are the desired future conditions, goals, objectives, and management priorities for  
 28 watershed systems?

- 1 • How will current and future change agents or drivers such as development in Chaffee  
2 County, climate change, invasive species, fire, and changes in recreational use and  
3 pressure affect monument biological ROVs in the period 2015-2035?
- 4 • How does BLM address BCNM flash flood sediment contribution to Arkansas River at  
5 Ruby Mountain?
- 6 • How does BLM and USFS respond to BCNM riparian and ephemeral drainage  
7 hydrologic function, ecological productivity, under temperature and precipitation  
8 concerns?
- 9 • Are the BLM and USFS adaptive management decisions appropriate to respond to  
10 BCNM climate-driven drought, long-term soil desiccation, tree, grass, forb, browse  
11 vegetation growth & productivity?

#### 12 **2.1.5.1 Assessment Area**

13 The BCNM boundary is the geographic area, extent, or scale considered for characterizing the  
14 conditions and trends of soil resources and watersheds.

#### 15 **2.1.5.2 Best Available Scientific Information**

16 Natural Resources Conservation Service (NRCS), U.S. Geological Survey (USGS), and U.S.  
17 Environmental Protection Agency (USEPA) 2017. Watershed Boundary Dataset for Colorado.  
18 Internet website: <http://datagateway.nrcs.usda.gov>. Accessed October 19, 2017.

19 NRCS. 2017. United States Department of Agriculture. Soil Survey Geographic (SSURGO)  
20 Database for Chaffee-Lake Areas, Colorado. Available online at:  
21 <http://soildatamart.nrcs.usda.gov>. Accessed October 18, 2017.

22 NRCS. 2017. Web Soil Survey Pike and San Isabel National Forest, Colorado, Northern Part,  
23 Parts of Chaffee, Clear Creek, Fremont, Jefferson, Lake, Park, and Saquache Counties. GIS  
24 data. Available online at <https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>.

25 NRCS. 2017. MLRA Explorer Mapping Tool. Available online at: <http://apps.cei.psu.edu/mlra/>.

26 NRCS. 2017. U.S. Drought Monitor Map. Available online at:  
27 <http://droughtmonitor.unl.edu/Home.aspx>.

28 NRCS. 2007. Soil Series Extent Mapping Tool. Available online at:  
29 <http://apps.cei.psu.edu/soiltool/semtool.html>.

30 NRCS. 2017. Web Soil Survey Chaffee-Lake Area, Colorado, Parts of Chaffee and Lake Counties.  
31 GIS data. Available online at: <https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>.

32 NRCS. 1975. Soil Survey of Chaffee-Lake Area, Colorado. GIS data.

33 NRCS. No date. Web Soil Survey Tool. Available online at:  
34 <https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>.

- 1 National Drought Monitor Center- NRCS, NOAA, NCMD. 2017. U.S. Drought Monitor Map.  
2 Available online at: <http://droughtmonitor.unl.edu/Home.aspx>.
- 3 Sanchez, Steve, D. Gilbert, J. Vieira. 2017. BLM Browns Canyon National Monument  
4 Management Planning Specialist Assessment Report and Notes, Resources and Objects of  
5 Value: Hydrology and Soil. Dated July 24, 2017.
- 6 USDA, USFS. 2011. Watershed Condition Framework, A Framework for Assessing and Tracking  
7 Changes to Watershed Condition, FS-977. Available online at:  
8 [https://www.fs.fed.us/biology/resources/pubs/watershed/maps/Watershed\\_Condition\\_Framework2011FS977.pdf](https://www.fs.fed.us/biology/resources/pubs/watershed/maps/Watershed_Condition_Framework2011FS977.pdf). Dated May 2011.
- 9
- 10 USDA, USFS. 2011. Watershed Condition Classification Technical Guide, FS-978. Available  
11 online at:  
12 [https://www.fs.fed.us/biology/resources/pubs/watershed/maps/watershed\\_classification\\_guide2011FS978.pdf](https://www.fs.fed.us/biology/resources/pubs/watershed/maps/watershed_classification_guide2011FS978.pdf) 3. A detailed explanation about. Dated July 2011.
- 13
- 14 USDA, USFS. 2012, April. National Best Management Practices for Water Quality Management  
15 on National Forest Lands. Available only at  
16 [https://www.fs.fed.us/naturalresources/watershed/pubs/FS\\_National\\_Core\\_BMPs\\_April2012.pdf](https://www.fs.fed.us/naturalresources/watershed/pubs/FS_National_Core_BMPs_April2012.pdf)  
17

### 18 **2.1.5.3 Limitations/Data Gaps**

- 19
- 20 • The BLM soil survey data is very broad which limits the amount of detail that can be provided on soil resources within the BLM administered lands.
  - 21 • Watershed health is described in the Planning Assessment using data provided by the USFS (Sanchez 2017). However, all these exiting data contain limitations; specifically,  
22 existing NHD, WBD, and USFS watershed condition data offer only a snapshot of  
23 conditions and do not provide information on trends or changing conditions over time.
  - 24 • Order 3 soil survey data is the best available data for the assessment area. Where data gaps exist, STATSGO data will be used, which is less accurate.
  - 25 • A soil mapping exercise revealed inconsistencies between soil inventories for BLM- and  
26 USFS- administered lands. The USFS data (soils\_lta\_psi) appears to be more detailed  
27 than the BLM data (NRCS-CO-SSURGO). Edge mapping is poor where the BLM and  
28 Forest mapping meet.  
29  
30

### 31 **2.1.5.4 Existing Conditions and Trends**

#### 32 **Soils**

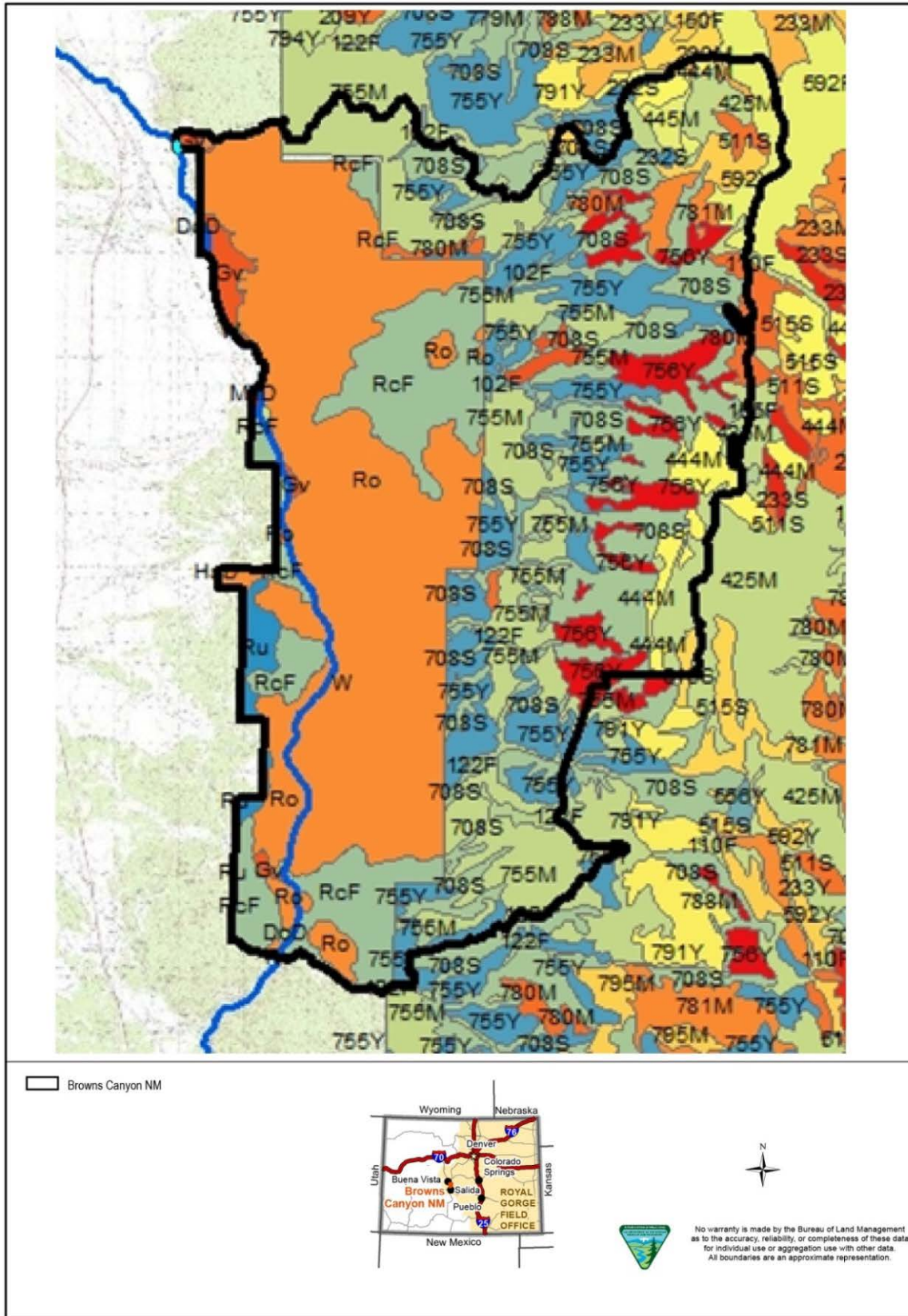
33 Soils in this region are predominantly Alfisols, Entisols, Inceptisols, and Mollisols. The  
34 dominant suborders are Ustepts, Ustolls, and Xerolls in valleys and on the lower mountain slopes

1 and Cryalfs and Orthents on the upper mountain slopes and crests. Figure 2-7 and Table 2-8 and  
2 Table 2-9 depict soils in the BCNM and their basic characteristics. A Soil Map Unit is a distinct  
3 grouping of soil components that have similar attributes. Attributes can include soil texture,  
4 landforms, slope, soil depth, water table depth, or other soil features.

5 The majority of BCNM soils as described in Figure 2-7, Table 2-8, and Table 2-9 are within  
6 natural range of erosion variability, relatively stable, and largely undisturbed within the last 100+  
7 years with some notable site-level exceptions. High soil ecological integrity and productivity is  
8 evident on monument ridges and slopes where functioning cryptobiotic crusts may be found as  
9 evidence of healthy soils, per land health standards. High load sediment events, as documented  
10 during BLM riparian inventory (2016-2017), reveal historic-era severe and high erosion  
11 occurring in all monument ephemeral drainages inventoried. Notable healthy soil condition  
12 exceptions in 2017, as characterized by high sediment load and on-going soil erosion, include 1)  
13 along the upper Cottonwood Creek and riparian drainage administered by USFS below Bassam  
14 Spring and high and on-going accelerated erosion not presently meeting BLM land health  
15 standards for soils at 2) Ruby Mountain, as a result of garnet collection and associated social  
16 trails, 3) downslope of the BLM Ruby Mountain parking area, that though recently mitigated in  
17 2017 still functions as a high sediment conveyance to the Arkansas River, and 4) all drainages  
18 downslope of Turret Trail.

19 Climate change and increased periods of drought, punctuated by extreme precipitation events,  
20 are likely to reduce soil water moisture, influence plant growth, and increase soil erosion risk as  
21 conditions become warmer and drier.

22 A soil erodibility factor (K-Factor) that is used in the universal soil loss equation is a measure of  
23 the susceptibility of soil particles to detachment and transport by rainfall and runoff. Estimation  
24 of the factor takes various soil parameters into account, including soil texture, percent of sand  
25 greater than 0.10 millimeters in diameter, soil organic matter content, soil structure, soil  
26 permeability, clay mineralogy, and coarse fragments. K-factor values range from 0.02 to 0.64.  
27 Greater values indicate a higher susceptibility to erosion.



1  
2 **Figure 2-7 Soil Resources within the BCNM (BLM 2017)**

**Table 2-8 Description of BLM Soil Mapped Units**

Soil Map Unit (MU) Name	MUSYM	MUID	Hydro Soil Group	Runoff	Erosion Hazard of Roads and Trails Dominant Characteristic	Ecological Range Site
Dominson gravelly sandy loam, 1 to 9 percent slope	DoD	NA	A	Low	Moderate	Dry Mountain Outwash
Dominson gravelly sandy loam, 9 to 45 percent slopes	DoF	NA	A	Medium	Severe	Dry Mountain Outwash
Gravelly alluvial land	Gv	NA	A	Low	Moderate	-
Hawksell sandy loam, 5 to 9 percent slopes	HaD	NA	A	Low	Moderate	Sandy Bench
Manhattan sandy loam, 3 to 9 percent slopes	MaD	NA	A	Low	Not Rated	-
Rockland, 15 to 60 percent slopes	RcF	NA	D	Very High	Not Rated	-
Rock outcrop	Ro	NA	D	Very High	Not Rated	-
Rough broken land	Ru	NA	B	Medium	Severe	-

Source: NRCS 2017

**Table 2-9 Description of USFS Soil Mapped Units**

Map Unit (MU) Name	MUSYM	MUID	Hydro Soil Group	Runoff	Erosion Hazard of Roads and Trails Dominant Characteristic	Ecological Range Site
Jodero family 0 -15 percent	Not Applicable	102F	Not Available	Slow to medium	Moderate - mud during seasonal wet periods, erosion hazard, surface compaction, and rutting.	Valleys
Cryoborolls - Cryaquolls 0 – 15 percent	Not Applicable	110F	Not Available	Medium	Cryoborolls moderate - variable, Cryaquolls - severe high water table	Valley sides
Cumulic Haploborolls, to 15 percent slopes.	Not Applicable	122F	Not Available	Medium	Severe- mud during seasonal wet periods, moderate load bearing strength, surface rutting, and compaction.	Valley
Quander family, 5 – 40 percent	Not Applicable	155F	Not Available	Medium	Moderate- mud during seasonal wet periods.	Valleys, upland plains, and alluvial fans
Granile family 40 – 65 percent	Not Applicable	232S	Not Available	Rapid	Severe- slope and erosion hazard.	Mountains and mesas

**Table 2-9 Description of USFS Soil Mapped Units**

<b>Map Unit (MU) Name</b>	<b>MUSYM</b>	<b>MUID</b>	<b>Hydro Soil Group</b>	<b>Runoff</b>	<b>Erosion Hazard of Roads and Trails Dominant Characteristic</b>	<b>Ecological Range Site</b>
Bushvalley families complex, 5 - 40 percent	Not Applicable	233M	Not Available	Medium	Slight	Mountains, mesas, and pediments
Bushvalley family - Rock outcrop complex, 40 – 150 percent	Not Applicable	233Y	Not Available	Rapid	Severe- slope and erosion hazard	Mountains and mesas
Parkview - Bushvalley families complex, 5 – 40 percent	Not Applicable	425M	Not Available	Medium	Parkview: Moderate-mud during seasonal wet periods, surface compaction, and rutting. Bushvalley: Moderate-shallow depth to bedrock.	Upland plains, fans, pediments, colluvium and hills
Leadville - Tongue River families complex, 5 – 40 percent	Not Applicable	444M	Not Available	Medium	Leadville: Slight. Tongue River: Moderate - moderate load bearing strength	Mountains and mesas
Redfeather - Leadville, moderately deep families, complex, 5 - 40 percent	Not Applicable	445M	Not Available	Medium	Slight - slight	Mountains and mesas
Leadville family, dry, 40 – 65 percent	Not Applicable	511S	Not Available	Rapid	Severe- slope and erosion hazard	Mountains
Nathrop - Cheadle families complex, 0 – 15 percent	Not Applicable	592F	Not Available	Rapid	Nathrop: Moderate- mud during seasonal wet periods, surface rutting, and compaction Cheadle: Slight	Upland plains and valleys
592Y—Cheadle family - Rock outcrop complex, 40 – 150 percent	Not Applicable	592Y	Not Available	Rapid	Cheadle: Severe- slope and erosion hazard Rock outcrop: Severe-cliffs and unstable talus	Hill, mountain, and mesa side slopes
Hechtman - Guffey families complex, 40 to 65 percent	Not Applicable	708S	Not Available	Rapid	Hechtman: Severe- slope and erosion hazard Guffey: Severe- slope and erosion hazard	Canyons, hills, and mountains
Ratake family - Rock outcrop complex, 5 – 40 percent	Not Applicable	755M	Not Available	Rapid	Ratake: Moderate-erosion hazard Rock outcrop: moderate-hard bedrock	Cliffs and talus, upland plains, hills, and pediments

**Table 2-9 Description of USFS Soil Mapped Units**

<b>Map Unit (MU) Name</b>	<b>MUSYM</b>	<b>MUID</b>	<b>Hydro Soil Group</b>	<b>Runoff</b>	<b>Erosion Hazard of Roads and Trails Dominant Characteristic</b>	<b>Ecological Range Site</b>
Ratake family - Rock outcrop complex, 40 – 150 percent	Not Applicable	755Y	Not Available	Rapid and slow	Ratake: Severe- slope and erosion hazard Rock outcrop: Severe-cliffs and talus	Canyons, hills, and mountains
Rogert family - Rock outcrop complex, 40 – 150 percent	Not Applicable	756Y	Not Available	Rapid and slow	Rogert: Severe- slope and erosion hazard Rock outcrop: Severe-cliffs and talus	Mountains
Herbman family, 5 – 40 percent	Not Applicable	780M	Not Available	Medium	Slight	Upland plains, hills, and mountains
Guffey - Herbman families complex, 5 – 40 percent	Not Applicable	781M	Not Available	Medium	Slight	North facing upland plains, hills, and mountains
Legault family, 5 – 40 percent	Not Applicable	795M	Not Available	Slow	Moderate- severe erosion hazard	Upland plains, hills, and mountains

Source USFS (date)

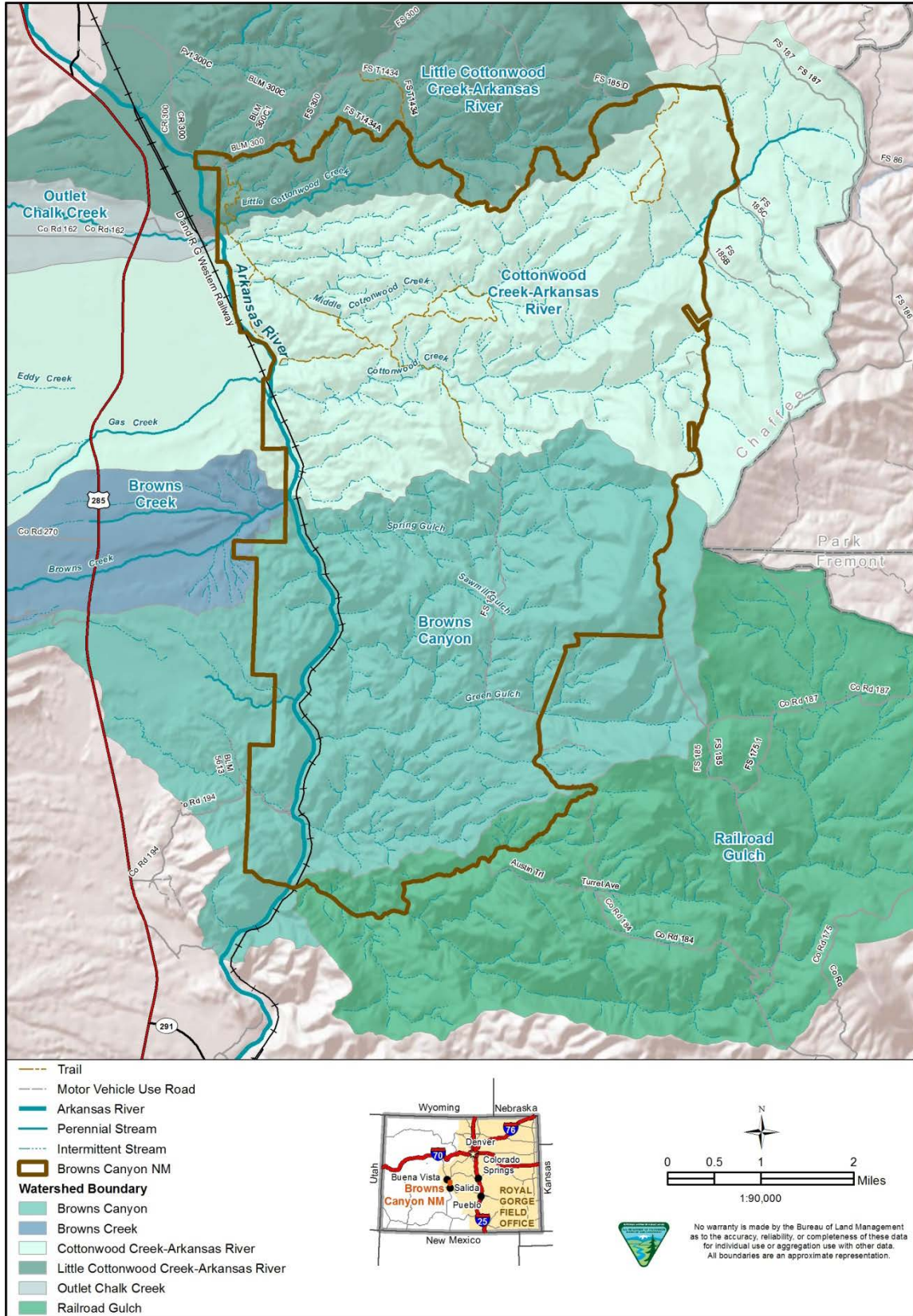
**1 Watersheds**

2 Figure 2-8 illustrates the major watersheds in BCNM.

3 The natural range of variability of watershed conditions (i.e., surface and subsurface moisture,  
4 spring and seep presence, stream flow, standing water, etc.) in the Arkansas River headwaters of  
5 Chaffee County and BCNM are driven by Bassam Park and Aspen Ridge snowpack, summer  
6 monsoon storms, and stressed by flash flood events, Arkansas River flow management,  
7 increasing winter and summer temperatures, and drought.

8 BCNM drainages occur in and represent 1.1 percent of the Arkansas Headwaters (USGS HUC8 -  
9 1,961,580 acres) and 9.4 percent of Trout Creek – Arkansas River (USGS HUC 10 230,298  
10 acres) hydrological basins. The 21,600 acres of catchment contribute to flows along  
11 approximately 7.8 miles of the Arkansas River, which courses through the BCNM (Figure 2-8).  
12 Surface waters are addressed in Section 2.1.6, Water Resources.





1  
2 **Figure 2-8 Watershed Boundaries and Streams within the BCNM**

1 The USFS developed a nationally consistent approach to prioritize watersheds for improvement  
2 (U.S. OMB 2006) called the Watershed Condition Class system (WCC). The Watershed  
3 Approach is a framework to guide watershed management that 1) uses watershed assessments to  
4 determine existing and reference conditions, 2) incorporates assessment results into resource  
5 management planning, and 3) fosters collaboration with all landowners in the watershed. The  
6 framework considers both ground and surface water flow within a hydrologically defined  
7 geographical area. The WCC assessment uses similar terminology as the BLM Proper  
8 Functioning Condition (PFC) assessment process (see Section 2.1.9, Wetlands and Riparian  
9 Resources), but generally focuses the analysis at the watershed-scale as opposed to individual  
10 stream segments.

11 The Watershed Condition Framework (FS-977) and the accompanying Watershed Condition  
12 Classification Technical Guide (FS-978) are the bases for establishing a consistent, comparable,  
13 and credible process and protocol for the USFS first national assessment of watershed condition  
14 across the nation for improving the health of watersheds on national forests and grasslands  
15 (USDA 2011).

16 This watershed health assessment process is quantitative to the extent feasible. It includes  
17 resource areas that have a significant influence on watershed condition. The WCC system relies  
18 on best professional judgment exercised by disciplinary teams, GIS data, available national  
19 databases, written rule sets, and criteria for indicators that describe proper function, functioning-  
20 at-risk, and impaired conditions. In 2010, the Pike-San Isabel National Forest conducted WCC  
21 assessments on the Little Cottonwood Creek – Arkansas River, Cottonwood Creek - Arkansas  
22 River, Browns Canyon, Outlet Chalk Creek, and Railroad Gulch Watersheds. These are the most  
23 recent watershed-based land health assessments within the BCNM. The results of those  
24 assessments are presented below in Table 2-10 and were summarized by three condition classes:

25 Class 1 - Functioning Properly: Physical watershed attributes are adequate to maintain or  
26 improve biological integrity.

27 Class 2 - Functioning at Risk: The watershed has minor impairment of beneficial uses to  
28 the waterbodies in the watershed.

29 Class 3 - Impaired Function: The watershed has some impaired functions because a  
30 threshold has been exceeded.

31 All watersheds assessed displayed some form of minor impairment. In the 2010 Condition Class  
32 Assessment, Little Cottonwood Creek – Arkansas River received an overall rating of 1.7,  
33 Cottonwood Creek – Arkansas River received was classified as a 1.7, Browns Canyon was 1.5,  
34 Outlet Chalk Creek was 1.8, and Railroad Gulch was 1.4 (Table 2-10). A rating of 2 reflects that  
35 the watershed has minor impairment of beneficial uses to the waterbodies in the watershed. A  
36 rating of 3 reflects that there is significant impairment of beneficial uses to the waterbodies in the  
37 watershed.

**Table 2-10 Watershed Health Assessment in the BCNM**

Watershed Name and HUC Number	Acres in BCNM	Acres Outside BCNM	Parameter and Condition Class Value												Overall Condition Class
			Aquatic Physical			Aquatic Biological		Terrestrial Physical		Terrestrial Biological					
			1. Water Quality	2. Water Quantity	3. Aquatic Habitat	4. Aquatic Biota	5. Riparian/Wetland Vegetation	6. Roads and Trails	7. Soils	8. Fire Regime or Wildfire	9. Forest Cover	10. Rangeland Vegetation	11. Terrestrial Invasive Species	12. Forest Health	
Little Cottonwood Creek – Arkansas River 110200010703	1,350	14,101	1	2	2	2.3	2	1.5	1	2	1	1	2	1	1.7
Cottonwood Creek – Arkansas River 110200010705	10,012	18,885	1	1.5	2	2.3	2	1.8	1	2	1	2	2	1	1.7
Browns Canyon 110200010708	9,593	5,325	1	1	2	2.3	1	2	1	1	1	1	2	1	1.5
Outlet Chalk Creek 110200010502	1	23,186	1	2.5	2.3	2.3	1	2.5	1	2	1	2	2	1	1.8
Railroad Gulch 110200010706	28	13,661	1	1	2	2.3	1	1.8	1	1	1	2	1	1	1.4
Browns Creek 110200010704	25		Further research												

Source: USFS and BLM (2010)

- 1 In 1999, the BLM conducted an assessment of the Upper Arkansas 4<sup>th</sup> level HUC to provide a
- 2 basis for understanding the status, trends, and issues surrounding federal public land
- 3 management and to identify opportunities for public land value protection.
- 4 The major soil and watershed resource concerns were water erosion; steep slopes; and shallow
- 5 and rocky soils. The potential increase in visitation to BCNM has the potential to result in
- 6 detrimental impacts to soil resources within the boundary of the BCNM. An increase in visitation
- 7 to BCNM may be accompanied by increasing public demand on natural resources and
- 8 disturbance to soils and watersheds.
- 9 Stressors on soil resources in direct relation to presence of the railroad presence include historic
- 10 molybdenum, coal, and other ore dust transported from outside the watershed, reduction of

1 mineral soil horizons and soil water storage capability, creosote railroad ties (cold tar and wood  
 2 tar loaded with sulfurs). Assuming an average width for the area impacted by the railroad bed  
 3 (track plus managed ROW) of 35 feet and the estimated length within BCNM of 6 miles, the  
 4 total amount of directly impacted productive soil and vegetation cover loss within BCNM is  
 5 25 acres (1 percent). The USFS uses a standard potential impact corridor of 118 feet to account  
 6 for indirect impacts such as runoff, compaction, and increased flows, which equates to 86 acres  
 7 (4 percent of BCNM) being indirectly impacted by the railroad corridor.

8 Soils near roads and trails show various degrees of impact from motorized and non-motorized  
 9 use. Some of these impacts stretched 0.25 to 0.5 mile downstream of their origination. Other  
 10 areas without roads and trails show slight to no impact from livestock and wildlife. Most soil  
 11 impact areas from livestock and wildlife were in proximity to drinking water sources.

12 Several BLM and USFS roads and trails are influences, drivers, and stressors of soil and water  
 13 resources in the BCNM. Table 2-11 presents roads and trails in BCNM, including lengths, and  
 14 estimated acres of lost vegetative cover.

**Table 2-11 Developed Routes, Trails, Campsites, Day Use Areas, Parking Lots and Boat Launches in BCNM**

Road / Trail Number	Common Name	Miles within BCNM watersheds	Acres of lost vegetative cover <sup>1</sup>
FS - 185	Aspen Ridge	7.87	33.0
FS - 185D	Aspen Ridge spur	3.90	16.0
	Turret	4.80	20.0
FS - 300	Bald Mountain	2.30	10.0
1435 Trail		2.50	2.0
1434 and 1434.A Trails		6.80	5.0
300 ATV		.70	.50
	Hecla Junction road	.65	2.8
	Hecla Junction camp sites and day use roads	.40	1.5
	Hecla Junction parking and boat ramp		1.6
	Trail parallel to Arkansas River downstream of Hecla Junction	.90	1 (10 foot two-track trail)
	Ruby Mountain camp sites and day use		2.2
	Ruby Mountain parking and boat ramp		1.1
	Ruby Mountain day use foot trails	.45	.3
T6046	Catkin Gulch loop	2.86 (approximately 1 mile is on USFS land)	2.0
T6045	Turret trail	5.41	6 (10 feet average disturbance)
T6045A	River bench	.85	.6
T6045B	River access	1.16	.8
<b>Total</b>		<b>10.73</b>	<b>9.7</b>

Assumes an average width of 35 feet for a road and 6 feet for a trail, except where noted.

Source: USFS and BLM (date)

1 Grazing impacts on soils and watersheds in BLM is mostly light with the exception Bald  
2 Mountain Road where there is heavy impact near water sources. The rest of BLM lands in  
3 BCNM show evidence of light and very minimal impact to soil and water resources from current  
4 grazing practices.

5 Grazing impacts on soils and watersheds on USFS ranges from light to high utilization near  
6 water resources. Within BCNM, utilization is greatest in Bassam Park and Aspen patches where  
7 water resources and soils are heavily impacted. In these areas, soils are compacted and stream  
8 banks show greater than 20 percent hoof impact.

9 Stream channels have become braided leading to greater evaporative loss of water and lower  
10 groundwater recharge. Loss of groundwater recharge has lead to increased intemittent channels  
11 and less surface flows.

12 Noxious weed species impact soil and water resources primarily by replacing drought tolerant  
13 species with deeper roots. The most common non-native species found within BCNM is Canada  
14 thistle.

15 Management of the railroad and water resources along the Arkansas River has caused alteration  
16 of the native-vegetated stream banks with concrete abutments, and rip rap. This shrinkage of the  
17 stream channel and bank, erosion, and flood control has several evident impacts including:

- 18 • Loss of riparian vegetation and associated macroinvertebrates
- 19 • Elevated water temperature
- 20 • Aggradation of sediment due to Thalweg alteration
- 21 • Reduction of overflow channels
- 22 • Loss of sinuosity

23 Boat launch and pull out areas have high visitor use. The evident stressors at these locations  
24 include introduction of non-native species, stream bank alteration, stream channel alteration,  
25 water quality degradation, loss of vegetated stream banks.

#### 26 **2.1.5.5 Existing Management Direction**

27 On BLM-administered lands, the agency manages soil resources primarily through BLM  
28 Handbook H-4810-1, Rangeland Health Standards. The Rangeland Health Standards are based  
29 on 43 CFR 4180.1, Fundamentals of Rangeland Health. This regulation directs the BLM to  
30 ensure that watersheds are in, or are making significant progress toward, properly functioning  
31 physical condition, including their upland, riparian-wetland, and aquatic components; soil and  
32 plant conditions support infiltration, soil moisture storage, and the release of water that are in  
33 balance with climate and landform and maintain or improve water quality, water quantity, and  
34 timing and duration of flow.

1 The USFS manages soil resources by implementing policy set forth in each National Forest Plan.  
 2 The Forest Service Manual, Soil Management (Chapter 2550) and the Forest Service Handbook,  
 3 Watershed Conservation Practices Handbook (Chapter 2509.25) specific to each region also  
 4 provide policy and guidance for soil resource management. Additionally, the Forest Service  
 5 Manual provides guidance on emergency stabilization and burned area emergency response  
 6 (Chapter 2523). The Multiple Use Sustained Yield Act requires the USFS to administer for  
 7 outdoor recreation, range, timber, watershed, terrestrial and aquatic wildlife purposes. The USFS  
 8 uses national best management practices in ground disturbing activities (USDA 2012).  
 9 Table 1-2 lists also relevant, existing Federal, state, and local management direction for soils and  
 10 watershed resources in the BCNM.

11 **Royal Gorge Resource Area RMP**

12 Management Objectives

- 13 • General management objectives are to avoid soil erosion and loss of watershed values  
 14 throughout the planning area. Specific objectives for soils are generally lacking.

15 Management Decisions

- 16 • Manage soil-disturbing activities to avoid soil erosion and loss of watershed values.
- 17 • Standards with stipulations for other resource actions will decrease erosion and  
 18 potentially enhance watershed characteristics.

19 **2.1.5.6 Needs for Change Management Opportunities**

20 Table 2-12 summarizes needs for change and management opportunities to consider in the  
 21 BCNM MP-EIS.

22 **Table 2-12 Needs for Change and Management Opportunities for Soils and Watersheds**

Needs for Change	Management Opportunities
Increased visitation and recreation use in BCNM will lead to increased disturbance and/or pressure on soil and watershed resources. Therefore, travel management and recreation will require on-going monitoring and mitigation.	Opportunities exist for continued trail and road maintenance, new mitigation at problem drainage pour points in select locations including but not limited to renovated developed sites, public access, trails and roads within and upslope of the river.  Opportunities exist for additional site-level riparian and spring mitigation and protections at upper monument elevations.

	<p>There are opportunities for partnership approaches to addressing resource degradation, conflicts associated with increased recreation and improved access to backcountry areas, and impacts to cultural and biological resources and threatened/endangered/sensitive plant and wildlife species, as described in Proclamation 9232.</p> <p>Specific soil and watershed management standards and guidelines should be established that address resource concerns within the monument.</p>
<p>The BLM soil survey data is very broad which limits the amount of detail that can be provided on soil resources within the BLM administered lands.</p>	<p>Work with NRCS and UC to complete new soil survey work in the future that is more detailed.</p>

1    **2.1.6     Water Resources (Surface, Ground, and Floodplains)**

2    The Arkansas River flows through BCNM and has long offered both a permanent source of  
3    water and a means of transportation for inhabitants of the Arkansas River Valley. Surface water  
4    resources within the BCNM are varied and include the Arkansas River itself, streams, springs,  
5    and wetlands; groundwater resources include several aquifers. The primary alluvial aquifer along  
6    the Arkansas River consists of unconsolidated river-deposited sediments. Recharge to the  
7    Arkansas River alluvium is primarily through infiltration of surface water through the streambed  
8    of the river (CGS 2003).

9    Surface water quality within the BCNM boundary is influenced by a variety of factors which  
10   include geology, mine drainage, runoff from snowmelt or rainfall, groundwater flow, water  
11   import, reservoir operations and water use (BLM 2015). Despite AHRA crowd control  
12   management efforts on recreational activities (e.g., camping, kayaking, rafting), recent increases  
13   in recreational use on and adjacent to the Arkansas River have resulted in water quality  
14   degradation.

15   Climate change and increased periods of drought are likely to reduce water availability as  
16   conditions become warmer and drier. These effects are expected to be most severe for large  
17   rivers like the Arkansas River, which have flows that are dependent on snowpack. Future  
18   management may need to focus on identifying areas that are the most susceptible to degradation  
19   and implementing protection measures for vulnerable hydrology and water resources within the  
20   BCNM. There are no specific ROVs for hydrology and water resource, apart from “The  
21   Arkansas River valley, which attracts visitors from around the world, and whose canyons, rivers,  
22   and backcountry forests have provided a home for humans for over 10,000 years.”

23   Planning issues and management concerns based on Proclamation 9232 and additional agency  
24   concerns include:

- 25       • What are the desired future conditions, goals, objectives, and management priorities for  
26       riverine, riparian, and aquatic systems?

- 1 • What riverine, riparian and spring restoration priorities are necessary to ensure that these
- 2 water resources are of sufficient quality and quantity to support aquatic, riparian and
- 3 terrestrial species and communities?
- 4 • Which resources are particularly sensitive and how should management be adjusted in
- 5 those areas?
- 6 • Where are the perennial riparian reaches, springs, and seeps?
- 7 • Where are high recreation impact riverine riparian reaches?
- 8 • How will current and future change agents or drivers such as development in Chaffee
- 9 County, climate change, invasive species, fire, and changes in recreational use and
- 10 pressure affect monument biological ROVs in the period 2015-2035?
- 11 • How does BLM and USFS manage punctuated or long-term drought impacts to Arkansas
- 12 river flows and BCNM anglers, rafters, outfitters, other recreation physical and
- 13 hydrologic settings and outcomes?
- 14 • What BLM and USFS land use allocation decisions are necessary to protect BCNM river
- 15 corridor, springs, seeps, intermittent stream health including from effects of higher
- 16 temperatures, long-term drought, or concentrated recreational use?

17 **2.1.6.1 Assessment Area**

18 The geographic area considered for characterizing conditions and trends of hydrology and water  
19 are sub-basins within or crossing the BCNM boundary, and aquifers underlying the area within  
20 the BCNM boundary.

21 **2.1.6.2 Best Available Scientific Information**

22 Colorado Department of Natural Resources, et al. 2000. Arkansas River Water Needs  
23 Assessment. July. Available:  
24 [https://cpw.state.co.us/placestogo/parks/ArkansasHeadwatersRecreationArea/Documents/Ad](https://cpw.state.co.us/placestogo/parks/ArkansasHeadwatersRecreationArea/Documents/Admin/Publications/WaterNeedsAssessment.pdf)  
25 [min/Publications/WaterNeedsAssessment.pdf](https://cpw.state.co.us/placestogo/parks/ArkansasHeadwatersRecreationArea/Documents/Admin/Publications/WaterNeedsAssessment.pdf)

26 Colorado Department of Public Health and Environment (CDPHE) Water Quality Control  
27 Division. 2015. Section 303(d) Listing Methodology, 2016 Listing Cycle. Denver, Colorado.  
28 March. Available at: <https://www.colorado.gov/pacific/sites/default/files/303dLM2016.pdf>.  
29 October 23, 2017.

30 Colorado Department of Public Health and Environment Water Quality Control Division. 2016.  
31 Integrated Water Quality Monitoring and Assessment Report. Available at:  
32 [https://www.colorado.gov/pacific/sites/default/files/2016-Integrated-Report\\_FINAL.pdf](https://www.colorado.gov/pacific/sites/default/files/2016-Integrated-Report_FINAL.pdf).  
33 October 23, 2017.



- 1 Colorado Division of Water Resources Department of Natural Resources. 2017. Water Rights  
2 Search. Available at: <http://cdss.state.co.us/onlineTools/Pages/WaterRights.aspx>. October 23,  
3 2017.
- 4 Colorado Geological Survey (CGS). 2003. Ground Water Atlas of Colorado. Available at:  
5 <http://coloradogeologicalsurvey.org/water/groundwater-atlas/>. January 9, 2018.
- 6 Colorado Natural Heritage Program (CNHP). 2015. Climate Change Vulnerability Assessment  
7 for Colorado Bureau of Land Management. K. Decker, L. Grunau, J. Handwerk, and J.  
8 Siemers, editors. Colorado Natural Heritage Program, Colorado State University, Fort Collins,  
9 Colorado. Available at:  
10 [http://www.cnhp.colostate.edu/download/documents/2015/CCVA\\_for\\_Colorado\\_BLM\\_final.](http://www.cnhp.colostate.edu/download/documents/2015/CCVA_for_Colorado_BLM_final.pdf)  
11 pdf October 23, 2017.
- 12 Colorado Water Conservation Board Department of Natural Resources. 2010. Statewide Water  
13 Supply Initiative. Available at: [http://cwcb.state.co.us/water-management/water-supply-](http://cwcb.state.co.us/water-management/water-supply-planning/pages/swsi2010.aspx)  
14 [planning/pages/swsi2010.aspx](http://cwcb.state.co.us/water-management/water-supply-planning/pages/swsi2010.aspx). October 23, 2017.
- 15 Colorado Water Quality Control Commission. 2011. Statewide Water Quality Management Plan.  
16 June. Available at: [https://www.colorado.gov/pacific/sites/default/files/WQ\\_SWQMP-Cover-](https://www.colorado.gov/pacific/sites/default/files/WQ_SWQMP-Cover-TOC.pdf)  
17 [TOC.pdf](https://www.colorado.gov/pacific/sites/default/files/WQ_SWQMP-Cover-TOC.pdf). October 23, 2018.
- 18 Colorado Water Quality Control Commission. 2012. Colorado Nonpoint Source Program. 2012  
19 Management Plan. February. Available at:  
20 [https://www.colorado.gov/pacific/sites/default/files/T1\\_WQCC\\_2012-NPS-management-](https://www.colorado.gov/pacific/sites/default/files/T1_WQCC_2012-NPS-management-Plan_0.pdf)  
21 [Plan\\_0.pdf](https://www.colorado.gov/pacific/sites/default/files/T1_WQCC_2012-NPS-management-Plan_0.pdf). October 23, 2017.
- 22 Sanchez, Steve, D. Gilbert, J. Vieira. 2017. BLM Browns Canyon National Monument  
23 Management Planning Specialist Assessment Report and Notes, Resources and Objects of  
24 Value: Hydrology and Soil. Dated July 24, 2017.
- 25 State of Colorado Ground Water Commission. 2017. Rules and Regulations for the Management  
26 and Control of Designated Groundwater. Re-amendment. 2 CCR 410-1. Available at:  
27 <http://water.state.co.us/DWRIPub/Documents/DBRulesWithFigs.pdf>. October 23, 2017.
- 28 United States Department of Agriculture (USDA). 2015. Browns Canyon National Monument  
29 Questions and Answers. February. Available at:  
30 [https://www.fs.fed.us/sites/default/files/media/2015/09/browns-canyon-national-monument-](https://www.fs.fed.us/sites/default/files/media/2015/09/browns-canyon-national-monument-QA-edits.pdf)  
31 [QA-edits.pdf](https://www.fs.fed.us/sites/default/files/media/2015/09/browns-canyon-national-monument-QA-edits.pdf). Accessed October 17, 2017.
- 32 Watts, Kenneth R. 2005. Hydrogeology and Quality of Ground Water in the Upper Arkansas  
33 River Basin from Buena Vista to Salida, Colorado, 2000-2003. Available:  
34 <https://pubs.usgs.gov/sir/2005/5179/pdf/SIR2005-5179.pdf>. Accessed: January 5, 2018.

1 **GIS Data**

- 2 • USGS National Hydrography Dataset, USGS\_NHD Waterbody. Available:  
3 <https://nhd.usgs.gov/data.html>. Accessed: October 2, 2017.
- 4 • USGS Watershed Boundary Dataset, USGS\_WBD HU12. Available:  
5 <https://nhd.usgs.gov/data.html>. Accessed: October 2, 2017.

6 **2.1.6.3 Limitations/Data Gaps**

7 The planning assessment relies primarily on the USGS National Hydrography Dataset (NHD)  
8 and Watershed Boundary Dataset (WBD) to characterized surface water resources within the  
9 BCNM boundary. Groundwater resources underlying the BCNM are determined using the  
10 Groundwater Atlas of Colorado. Therefore, the Planning Assessment also relies on other  
11 government and/or management reports to identify trends, drivers and stressors for water  
12 resources and hydrology within the BCNM.

13 **2.1.6.4 Existing Conditions and Trends**

14 **Surface Water**

15 The BCNM overlaps portions of six, sixth-level hydrologic unit code (HUC) watersheds, as  
16 depicted on Figure 2-8. Approximately 110 miles of ephemeral, intermittent, and perennial  
17 streams drain BCNM, generally to the west into the Arkansas River, which traverses the area  
18 from north to south. Within the region of the BCNM, agriculture accounts for the largest amount  
19 of water used in the Arkansas River basin (BLM 2015).

20 Surface water quality within the BCNM boundary is influenced by a variety of factors,  
21 including: geology, mine drainage, runoff from snowmelt or rainfall, groundwater flow, water  
22 import, reservoir operations and water use (BLM 2015). The Arkansas River exhibits distinct  
23 spatial and seasonal variations of water quality; spatial variations occur where water quality is  
24 influenced by mineralized mine drainage while seasonal variations result from snowmelt runoff,  
25 releases of water from upstream reservoirs, and sediment-laden runoff from summer rainstorms  
26 (BLM 2015). No surface waters within the BCNM are listed on the 303(d) list of Impaired  
27 Waters (CDPHE 2015).

28 Historic mining activities have contributed to water quality issues due to the release of heavy  
29 metals onto surface waters, including the Arkansas River. Heavy metal loading in waterways can  
30 have a negative impact on public and aquatic health. Similarly, BCNM has a variety of sources  
31 that contribute to excessive erosion and sediment loading onto surface waters. As described in  
32 the ECRMP AMS, soil-surface disturbing activities, such as OHV and trail use, are known to  
33 cause sedimentation in surface water bodies (BLM 2015). Approximately 6 miles of railroad  
34 corridor lie within the BCNM, generally parallel to the Arkansas River. Historically, the  
35 railroad's presence has been a primary stressor on water quality and hydrologic regime through

1 incidental spills of petroleum products and/or loads containing molybdenum, coal, and other  
2 substances (Sanchez 2017).

### 3 **Groundwater**

4 Many different aquifers with a variety of hydrologic characteristics are located within the BCNM  
5 boundary. The primary aquifers include alluvial and basin-fill aquifers (Watts 2005). The  
6 primary alluvial aquifer along the Arkansas River consists of unconsolidated river-deposited  
7 sediments (CGS 2003). Alluvial aquifers are defined as shallow sand and gravel deposits that are  
8 mostly located in river channels or floodplains. Basin-fill aquifers are fine-grained deposits of  
9 silt and clay formed by faulting or erosion or a combination of both. The quality of groundwater  
10 within the vicinity of the BCNM varies according to the rate of groundwater movement and the  
11 chemical composition of the rocks within the aquifer (BLM 2015). Within the BCNM,  
12 groundwater is entirely used for natural surface water recharge and long-term water storage  
13 (Sanchez 2017).

### 14 **Water Use**

#### 15 Augmented Flows

16 The Arkansas River within and adjacent to the BCNM is primarily used to augment water to  
17 downstream water right holders (Sanchez 2017). Augmented flow rates on the Arkansas River  
18 within the BCNM likely have impacts on fish, wildlife, and recreational users including rafters,  
19 kayakers, anglers, water quality, and water quantity.

#### 20 Beneficial Uses

21 Beneficial uses are defined as application of water without waste for human or natural benefit.  
22 Some common types of beneficial use are: domestic, household use, irrigation, municipal,  
23 wildlife, recreation, and mining. There are typically two types of water uses: consumptive and  
24 non-consumptive. Within the BCNM, water use is entirely non-consumptive and includes: the  
25 monument, water used by wildlife, water used by livestock and humans, and water used by  
26 natural vegetation and not leaving the watershed. Beneficial uses are allocated through water  
27 right filings in Colorado Water Court (Sanchez 2017). The USFS has two water rights and no  
28 well permits within the BCNM boundaries, while the BLM has no water rights and two well  
29 permits. Three private well permits exist within the BCNM, all located on BLM-administered  
30 lands (Sanchez 2017).

#### 31 Water Rights

32 A water right is established by taking steps to put water to beneficial use. These rights are  
33 administered on the basis of seniority and are established by provided evidence of the intent to  
34 appropriate water. Water rights are property rights and can be sold; however, establishment of  
35 the monument will not alter or affect the valid existing water rights nor will it alter or affect

1 agreements governing the management and administration of Arkansas River flows (USFS  
2 2015).

3 Public Drinking Water

4 All surface water collects in the Arkansas River. The Arkansas River Basin is one of 7 major  
5 basins in Colorado that provide fishery and wildlife habitat, irrigation, and drinking water for all  
6 the cities and communities located on its banks, as well as the cities outside of its watershed  
7 including Aurora and Colorado Springs. Water provided to Aurora and Colorado Springs is  
8 accomplished through a comprehensive exchange process primarily through the Otero Pump  
9 Station upstream of BCNM, and the Pueblo Reservoir downstream of BCNM (Sanchez 2017).

10 In summary, the drivers and stressors for hydrology and water resources in the BCNM include  
11 the following:

- 12 • Augmented flow rates on the Arkansas River within the BCNM will likely remain a  
13 driver for a variety of factors including recreational use, water quality, and water  
14 quantity.
- 15 • Seasonal variations of overall water quality are a result from snowmelt runoff, releases of  
16 water from upstream reservoirs (during the irrigation season), and sediment-laden runoff  
17 from summer rainstorms.
- 18 • Sediments and mineralized drainage from mines upstream of the BCNM will likely  
19 contribute to water quality degradation within the Arkansas River.
- 20 • Increased visitation and recreational use in the BCNM will likely lead to increased  
21 physical disturbances in highly erodible soils adjacent to the Arkansas River, primarily at  
22 boat launch areas. Associated stressors include the introduction of non-native species,  
23 stream bank alteration, stream channel alteration, loss of stream bank vegetation, and  
24 overall water quality degradation.
- 25 • The railroad corridor will likely continue to be a primary stressor on water quality and the  
26 hydrologic regime along the Arkansas River.
- 27 • Drought, exacerbated by climate change, could gradually impact water availability and  
28 quality within BCNM. See the *Climate* section for additional information on climate-  
29 driven changes to water.

30 **2.1.6.5 Existing Management Direction**

31 Table 1-2 lists relevant, existing Federal, state, and local management direction for water  
32 resources in the BCNM.

33 **BLM Royal Gorge Resource Area RMP (Eco-Subregion 1, Arkansas River)**

34 Objective Decisions

- 1 • None applicable

2 Allocation Decisions

- 3 • All streams will be protected through:
  - 4 ○ Standard lease terms for fluid minerals;
  - 5 ○ Locatable mineral entry closures except for recreational placering;
  - 6 ○ Mineral materials disposal closures;
  - 7 ○ OHV use limited to designated roads and trails.
- 8 • Management for all existing waterpower/reservoir resources will be designated as
- 9 unsuitable.
- 10 • Initiate and forward recommendations for revocation of unsuitable waterpower/reservoir
- 11 resources.

12 Action Decisions

- 13 • None applicable

14 **2.1.6.6 Needs for Change and Management Opportunities**

15 Given the resource conditions, trends, and existing management in BCNM, Table 2-13  
 16 summarizes needs for change and management opportunities to consider in the BCNM MP.

17 **Table 2-13 Needs for Change and Management Opportunities for Water**

Needs for Change	Management Opportunities
With increases in recreational use in BCNM following its designation comes the need for mitigating the potential for the degradation or depletion of water resources.	Manage disturbance from recreational use of Arkansas River bank vegetation, especially at boat launches and other areas where the public congregates. Reduce the risk of human-caused pollution and water degradation in the BCNM through use limitations, increased public awareness and/or implementation of use restrictions. Establish BMPs to help minimize water quality degradation for all land use activities with potential for degrading water quality. Conduct, or coordinate with other agencies or stakeholders to conduct, water quality monitoring in areas that may be susceptible for water quality degradation to ensure that soil-surface disturbing activities do not result in significant water degradation. Emphasize all watershed activities that provide protection, maintenance, and enhancement of the watershed resources including the support watershed provides to other resource programs and activities.

18 **2.1.7 Terrestrial Vegetation**

19 The variable climate, elevation, and soils of the BCNM support a variety of vegetation. This PA  
 20 groups the upland vegetation in BCNM into three main groups for the purpose of describing  
 21 existing conditions and trends: grassland, woodland/shrubland, and forest.

1 Overuse by wildlife and/or livestock has resulted in overbrowsed shrubs and trees and poor shrub  
2 vigor in some areas of the region (BLM 2015). Disturbed grassland sites, particularly at canyon  
3 bottoms, around water, or within small parks are often dominated by annual weeds or shrubs.  
4 Along the canyon bottom of the Arkansas River within the BCNM, most sites are dominated by  
5 grasses, forbs, and shrubs (Figure 2-9). Various non-native, noxious, and/or invasive weeds are  
6 beginning to expand onto public lands from unmaintained rail corridors and highway right-of-  
7 ways in the region. Recent droughts have exacerbated the spread of weeds. Recreation on public  
8 lands in Chaffee County has dramatically increased over recent years and the increase is  
9 expected to continue. Physical disturbances associated with dispersed recreation (e.g., motorized  
10 vehicle travel, hiking, camping, rock collecting) can damage plants. In addition, the alteration of  
11 normal drainage patterns associated with roads, trails, the railroad, and range or watershed  
12 improvement projects has altered native plant communities.

13 Climate change and drought are likely to alter plant communities in the Arkansas Valley as the  
14 climate continues to become warmer and drier. These effects are expected to be greatest at the  
15 interface between ecological communities. Future management may need to focus on restoring  
16 vegetation health through managing for desired plant communities and managing allowable uses  
17 to minimize direct damage to vegetation and spread of non-native invasive plant species.

18 ROVs for terrestrial vegetation include the following:

- 19 • The forest community incorporates a transition zone with semi-arid piñon (*Pinus edulis*)-  
20 juniper (*Juniperus scopulorum*) and mountain mahogany (*Cercocarpus montanus*)  
21 woodlands with native greass and perennial forb understory on the lower slopes giving  
22 way to ponderosa pine (*Pinus ponderosa*), limber pine (*Pinus flexilis*), Douglas-fir  
23 (*Pseudotsuga menziesii*), and Engelmann (*Picea engelmannii*) and blue (*Picea pungens*)  
24 spruce at higher elevations. Scattered pockets of aspen (*Populus tremuloides*) are also  
25 found at higher elevations. The riparian, spring, and riverine plant communities include  
26 willow (*Salix* spp.), Rocky Mountain juniper (*Juniperus scopulorum*), water birch (*Betula*  
27 *occidentalis*), and narrowleaf cottonwood (*Populus angustifolia*), which are primarily  
28 found along the Arkansas River and in drainage bottoms.
- 29 • The forest understory includes a variety of plant species, including several species of  
30 grasses and cactus, yucca (*Yucca glauca*), and an array of wildflowers such as scarlet  
31 gilia (*Ipomopsis aggregata*) and larkspur (*Delphinium* spp.) bloom.
- 32 • The Aspen Ridge area is home to a significant stand of quaking aspen (*Populus*  
33 *tremuloides*).
- 34 • Plant communities significant to tribal nations including species of cacti, Oshá  
35 (*Ligusticum porteri*), and other medicinal plants.

36 Planning issues and management concerns based on Proclamation 9232 and additional agency  
37 concerns include:

- 38 • What role should fire play in the monument and the WSA?

- 1 • What treatments are necessary to reduce the impacts associated with fire, insects, non-  
2 native/invasive species, and disease?
- 3 • What goals, objectives and management actions, including desired future conditions and  
4 land restoration priorities, are necessary to continue progress toward achieving land  
5 health standards?
- 6 • Where is special management needed to restore, maintain, or enhance priority vegetation  
7 species (including special status species)?
- 8 • What BLM and USFS land use allocations consistent with WSA are available to address  
9 adverse BCNM terrestrial vegetation response to temperature and drought trends in  
10 cottonwood-willow riparian gallery forests, piñon-juniper woodlands, mixed conifer,  
11 aspen, park meadows, and more rare plant community types?

12 **2.1.7.1 Assessment Area**

13 The geographic area considered for characterizing conditions and trends of vegetation ROVs is  
14 the BCNM boundary.

15 **2.1.7.2 Best Available Scientific Information**

16 Best available scientific information for terrestrial vegetation includes the following scientific  
17 literature and reports listed below. References that are laws, orders, handbooks, or LUPs are  
18 stated one time in Table 1-2 to reduce redundancy.

19 Adams, et. al. 2017. Temperature Response Surfaces for Mortality Risk of Tree Species with  
20 Future Drought. Environmental Research Letters, Volume 12, Number 11. Available at:  
21 <http://iopscience.iop.org/article/10.1088/1748-9326/aa93be/meta>. Accessed December 18,  
22 2017.

23 Colorado Department of Agriculture. 2018. Noxious Weed Species. Available at:  
24 <https://www.colorado.gov/pacific/agconservation/noxious-weed-species>. Accessed Devenber  
25 18, 2017.

26 Colorado Natural Heritage Program. 2009. Survey of Critical Biological Resources Chaffee  
27 County, Colorado 2003. Culver, D., Malone, D., Neid, S. and, Handwerk, J. Colorado Natural  
28 Heritage Program, Colorado State University, Fort Collins, Colorado. Available at:  
29 [http://www.cnhp.colostate.edu/download/documents/2009/CHAFEE\\_FINAL\\_REPORT05\\_14\\_2009.pdf](http://www.cnhp.colostate.edu/download/documents/2009/CHAFEE_FINAL_REPORT05_14_2009.pdf). Accessed on October 24, 2017.  
30

- 1 Colorado Natural Heritage Program. 2015. Climate Change Vulnerability Assessment for  
2 Colorado Bureau of Land Management. K. Decker, L. Grunau, J. Handwerk, and J. Siemers,  
3 editors. Colorado Natural Heritage Program, Colorado State University, Fort Collins,  
4 Colorado. Available at:  
5 [http://www.cnhp.colostate.edu/download/documents/2015/CCVA\\_for\\_Colorado\\_BLM\\_final.](http://www.cnhp.colostate.edu/download/documents/2015/CCVA_for_Colorado_BLM_final.pdf)  
6 pdf Accessed on October 23, 2017.
- 7 Conservation Colorado et al. 2017. Notice of Intent to Start Browns Canyon National Monument  
8 Plan Assessment Phase Letter. July 30, 2017.
- 9 McNeeley, S.M., Knapp, C., Even, T., Gioia, J., and Nave, J., 2017. Colorado Bureau of Land  
10 Management: Social Vulnerability Assessment, Final Report. North Central Climate Science  
11 Center, Fort Collins, CO. Available at: [http://nccsc.colostate.edu/project/colorado-bureau-](http://nccsc.colostate.edu/project/colorado-bureau-land-management-social-vulnerability-assessment)  
12 [land-management-social-vulnerability-assessment](http://nccsc.colostate.edu/project/colorado-bureau-land-management-social-vulnerability-assessment). Accessed on December 6, 2017.
- 13 Olson, Steve. 2017a. Browns Canyon National Monument Management Planning Specialist  
14 Assessment and Notes. Working draft July 26, 2017.
- 15 Olson, Steve. 2017b. U.S. Forest Service. Browns Canyon National Monument BioBlitz Species  
16 List (bcnmspp\_jAN2017.xls). January.
- 17 Toevs, G.R., J.J. Taylor, C.S. Spurrier, W.C. MacKinnon, and M.R. Bobo Bureau of Land  
18 Management Assessment, Inventory, and Monitoring Strategy: For integrated renewable  
19 resources management. Bureau of Land Management, National Operations Center, Denver,  
20 CO.
- 21 U.S. Department of the Interior (DOI) and Colorado Parks and Wildlife (CPW). 2018. Arkansas  
22 Headwaters Recreation Area Management Plan/ Environmental Assessment (AHRA).  
23 October. Available at:  
24 [http://cpw.state.co.us/placestogo/parks/ArkansasHeadwatersRecreationArea/Pages/AHRA-](http://cpw.state.co.us/placestogo/parks/ArkansasHeadwatersRecreationArea/Pages/AHRA-Plan-Revision.aspx)  
25 [Plan-Revision.aspx](http://cpw.state.co.us/placestogo/parks/ArkansasHeadwatersRecreationArea/Pages/AHRA-Plan-Revision.aspx). Accessed October 17, 2017.
- 26 USFS. 2016a. Draft Assessment Report of Ecological, Social, and Economic Conditions on the  
27 Custer Gallatin National Forest. Available at:  
28 [www.fs.usda.gov/detail/custergallatin/landmanagement/planning/?cid=fseprd520802](http://www.fs.usda.gov/detail/custergallatin/landmanagement/planning/?cid=fseprd520802).  
29 Accessed December 19, 2017.
- 30 USFS. 2016b. Forest Health Annual Aerial Survey Report. Available at:  
31 <https://www.fs.usda.gov/main/r2/forest-grasslandhealth>. Accessed on December 6, 2017.
- 32 USFS. 2017a. Vegetation Inventory Survey Geographic Information System Data – Forest  
33 Service GIS Vegetation Layer. November, 2017.
- 34 USFS. No Date. Rio Grande National Forest – Assessment 4 Carbon. Rio Grande National Forest  
35 Plan Revision – Assessments. Available:  
36 [https://www.fs.usda.gov/detailfull/riogrande/landmanagement/projects/?cid=fseprd493835&w](https://www.fs.usda.gov/detailfull/riogrande/landmanagement/projects/?cid=fseprd493835&width=full)  
37 [idth=full](https://www.fs.usda.gov/detailfull/riogrande/landmanagement/projects/?cid=fseprd493835&width=full). Accessed January 8, 2018.



1 **GIS Data**

- 2 • USFS Vegetation, BCNM\_Vegetation.shp. Accessed: December 18, 2017

3 **2.1.7.3 Limitations/Data Gaps**

4 The planning assessment relies primarily on the Forest Service GIS Vegetation Layer to  
5 characterize present-day conditions in the BCNM; however, these data contain limitations.  
6 Specifically, the Forest Service GIS Vegetation could miss small patches of vegetation, smaller  
7 than the minimum mapping unit in the mapping and GIS modeling process. Furthermore, the  
8 mapped vegetation and vegetation surveys conducted since the BCNM designation only offer a  
9 snapshot of current conditions, but does not provide information on trends or changing  
10 conditions over time. Therefore, the Planning Assessment also uses other sources and best  
11 available science and government and/or management reports for plant communities within the  
12 BCNM to identify trends and vegetation community drivers and stressors applicable to BCNM.  
13 These other sources include primary literature and survey data on plant communities by the  
14 BLM, USFS, and Colorado Natural Heritage Program. The landscape and vegetation are very  
15 slow to change due to site conditions throughout most of BCNM. As a result, it is assumed that  
16 most communities are stable in the long-term.

17 **2.1.7.4 Existing Conditions and Trends**

18 Elevation, slope, aspect, and soil type are the major determinants of plant communities in the  
19 BCNM. Most conspicuous among these within BCNM is elevation. Within the southern Rocky  
20 Mountains Ecoregion where the BCNM is located, vegetation, as well as soil and land use,  
21 follow a pattern of elevation banding (BLM 2015). Although there are frequent exceptions  
22 within the BCNM, piñon-juniper woodlands most often occur at elevations below 7,500 feet;  
23 ponderosa pine woodlands and forests are between 7,500 and 9,000 feet; and Douglas-fir, spruce,  
24 and aspen forests are found above 9,000 feet. There are also tendencies for vegetation types to  
25 occur on specific slopes and aspects. Less obvious, but perhaps more important for some species,  
26 are the soil type, its parent material, and the underlying geology.

27 Existing vegetation within the BCNM has been determined using the Forest Service GIS  
28 Vegetation Layer, as summarized in Table 2-14 (USFS 2017). Forests and woodland  
29 communities in the BCNM primarily include aspen woodlands, limber pine woodlands, Douglas-  
30 fir, cool- and warmed-mixed conifers, piñon-juniper woodlands, ponderosa pine, and spruce-fir  
31 forest. Riparian trees, grasses, and mountain mahogany shrublands are also present within the  
32 BCNM. Figure 2-9 illustrates the vegetation communities within BCNM.

33 Implementation of the BLM Assessment, Inventory, & Monitoring (AIM) strategy (Toevs et al.  
34 2011) across the BCNM will provide the opportunity to characterize vegetation and soil  
35 communities following a standardized and unbiased approach. As of 2017, only one AIM plot  
36 has been established in the BCNM, which limits the ability to characterize sites at the larger  
37 scale at this time. Increased sampling in future years will allow for the development of a

- 1 statistically valid assessment of vegetative and soil resources and the monitoring of conditions
- 2 and long-term trend within the monument.

**Table 2-14 Vegetation Communities and Land Cover within BCNM**

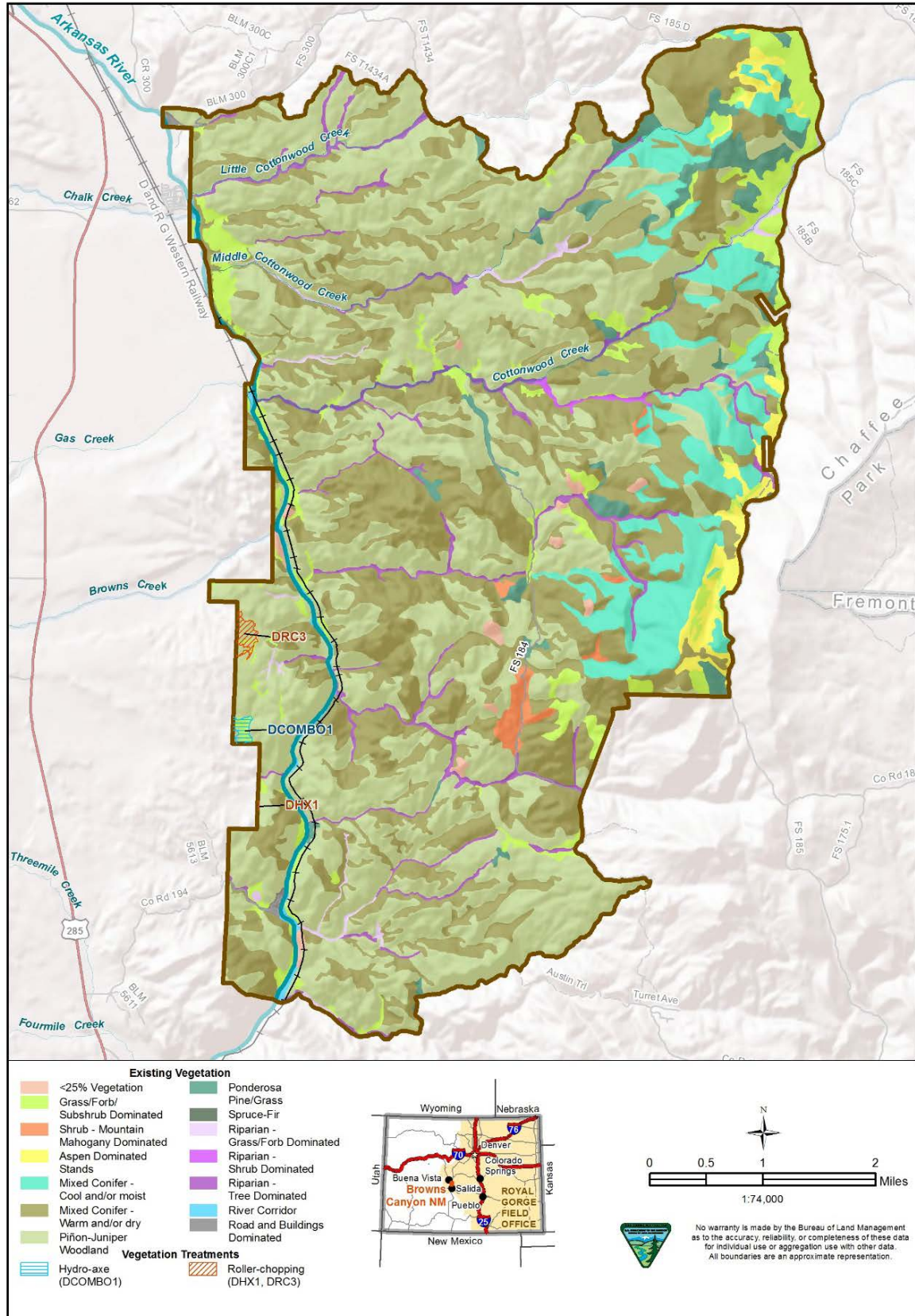
Land Cover	Acres	Percent of BCNM
Aspen Dominated Stands	342.8	1.6
Grass/Forb/Shrub	1,233.6	5.7
Mixed Conifer – Cool and/or Moist	1,510.3	7.0
Mixed Conifer – Warm and/or Dry	6,637.3	30.7
Piñon-Juniper Woodland	10,145.7	47.0
Ponderosa Pine/Grass	528.9	2.4
Riparian – Grass/Forb Dominated	141.4	0.7
Riparian – Shrub Dominated	30.8	0.1
Riparian – Tree Dominated	592.6	2.7
Shrub – Mountain Mahogany Dominated	135.7	0.6
Spruce/Fir	1.6	0.0
River Corridor	180.8	0.8
Roads and Buildings	22.5	0.1
Areas with less than 25 percent vegetative cover	99.8	0.5
<b>Total</b>	<b>21,603.7</b>	<b>100.0</b>

3 Source: USFS 2017a

4 In 2016, naturalists from the public and natural resource specialists from the USFS and BLM  
 5 conducted a “BioBlitz” of the BCNM, which is an intensive biological survey effort that  
 6 attempts to record all species within a designated area. The BCNM BioBlitz survey recorded a  
 7 total of 340 plant species representing 62 families of plants (Olson 2017b).

8 Most of the vegetation within BCNM is likely within its natural range of variability (Olson  
 9 2017a). Within plant communities, there is some indication that diversity, composition, and  
 10 frequency are degraded, and this may pose a threat to sustainability of native species in some  
 11 areas. These affected communities may not be as resistant to changing conditions, disturbances,  
 12 or weed invasions. Further, the analysis of Vegetation Condition Class provided in Section 2.1.8,  
 13 Wildland Fire Ecology suggests a moderate level of departure from a natural range of variability  
 14 previously sustained by historical fire regimes.

15



1  
2

Figure 2-9 Existing Vegetation within the National Monument Boundary BCNM

1 Between 1980 and 1985, 40 bighorn sheep were reintroduced into BCNM area. Today, it is  
 2 estimated that a herd of 135 bighorn sheep whose range includes BCNM and portions of the  
 3 Aspen Ridge (CNHP 2009). The area is also an important wintering ground for deer and elk.  
 4 Some of the grass/forb dominated areas of the BCNM are currently showing evidence of long-  
 5 term grazing by livestock. Some of these grasslands may be outside their natural range of  
 6 variability because of a shift from cool season mid-height grasses and forbs to dominance of  
 7 short grasses and fringed sagebrush (USFS 2017b).

8 Another important vegetation ecological driver anticipated to affect BCNM is insect and disease  
 9 infestations. Waves of insects and disease have likely spread throughout the BCNM in the past,  
 10 thinning forest stands. The loss of some pine, fir, and spruce trees during the current outbreaks of  
 11 spruce mountain pine beetle may have similar impacts. Aerial surveys indicate moderate to  
 12 severe spruce and mountain pine beetle activity near the boundaries of the BCNM between 1996  
 13 and 2016 (USFS 2016b).

14 Noxious weeds are present along the Arkansas River corridor and in the surrounding region due  
 15 to historical agricultural practices, mining, construction, and increasing recreational use (DOI  
 16 and CPW 2017). Noxious weeds within 5 miles of the river corridor can include, but are not  
 17 limited to the species listed in Table 2-15. Chaffee County manages 12 species of noxious weeds  
 18 within the County. Two species of noxious weeds on the Chaffee County Weed List were  
 19 confirmed to be present within the BCNM boundary during the 2016 BioBlitz: Canada thistle  
 20 and dalmation toadflax (Olson 2017b).

**Table 2-15 Noxious Weeds within 5-miles of the Arkansas River Corridor**

Common Name	Scientific Name	State of Colorado Weed List <sup>1</sup>
Black henbane	<i>Hyoscyamus niger</i>	B
Bull thistle	<i>Cirsium vulgare</i>	B
Canada thistle	<i>Cirsium arvense</i>	B
Common tansy	<i>Tanacetum vulgare</i>	B
Dalmation toadflax	<i>Linaria dalmatica</i>	B
Diffuse knapweed	<i>Centaurea diffusa</i>	B
Downy brome	<i>Bromus tectorum</i>	C
Elongated mustard	<i>Brassica elongate</i>	A
Field bindweed	<i>Convolvulus arvensis</i>	C
Houndstongue	<i>Cynoglossum officinale</i>	B
Leafy spurge	<i>Euphorbia esula</i>	B
Musk thistle	<i>Carduus nutans</i>	B
Myrtle spurge	<i>Euphorbia myrsinites</i>	A
Oxeye daisy	<i>Leucanthemum vulgare</i>	B

Perennial pepperweed	<i>Lepidium latifolium</i>	B
Plumeless thistle	<i>Carduus acanthoides</i>	B
Russian knapweed	<i>Rhaponticum repens</i>	B
Russian olive	<i>Elaeagnus angustifolia</i>	B
Salt cedar	<i>Tamarix</i> spp.	B
Scentless chamomile	<i>Tripleurospermum inodorum</i>	B
Scotch thistle	<i>Onopordum acanthium</i>	B
Spotted knapweed	<i>Centaurea maculosa</i>	B
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>	B
Yellow toadflax	<i>Linaria vulgaris</i>	B

Sources: DOI and CPW 2017; Colorado Department of Agriculture 2018

Notes: <sup>1</sup> List A species in Colorado are designated for eradication. List B species are those which a state noxious weed management plan has been designed to stop the continued spread. List C species are those which a state noxious weed management plan designed to support the efforts of local governing bodies has been prepared to provide additional education, research, and biological control resources to jurisdictions that choose to require management of List C species.

1 In 2003, mechanical treatments utilizing hydro-axe and roller-chopping methods were applied to  
 2 a total of 222 acres of BLM and private lands along the western boundary of the BCNM to  
 3 reduce the density of piñon pine. Of the 222 acres treated, hydro-axe and roller-chopping  
 4 methods were applied on 19 acres and 28 acres of BLM-administered lands in the BCNM,  
 5 respectively (Figure 2-9). The objectives of the treatment were to improve soil stability and  
 6 increase herbaceous and shrub forage for both wildlife and livestock. The treatment areas were  
 7 initially broadcast seeded but maintenance is needed to preserve the project investment. The  
 8 BLM intends hand-thin encroaching piñon saplings in the treatment areas sometime during 2018.

9 A warmer climate has had many effects, both directly and indirectly. For example, it has reduced  
 10 the severity of cold weather that has historically kept bark beetle populations in check. In some  
 11 areas, a warming climate may cause vegetation types in certain areas to “transition” (when one or  
 12 more species is replaced by one or more other species). Other predicted effects include more  
 13 severe or frequent wildfires (USFS 2016a). See the *Climate* section for additional information on  
 14 climate-driven changes to vegetation.

15 Carbon stocks refers to the amount of carbon stored in the world’s land-based ecosystem, mainly  
 16 within living vegetation and soil, but also in dead wood and litter. While carbon is stored  
 17 beneficially, it is also released as part of carbon dioxide—a key contributor to greenhouse gases,  
 18 which are considered a major cause of global warming. Forest carbon levels naturally change  
 19 over time. For example, when they are in a rapid growth mode, forests may pull more carbon  
 20 dioxide from the atmosphere than they give off, which may help slow global warming. However,  
 21 several factors can accelerate, slow or even reverse this trend. These factors may include removal  
 22 of live trees from the carbon cycle due to timber harvest, human land development, recent  
 23 droughts, severe wildfires, and insect and disease epidemics (USFS 2016a). Carbon stocks in  
 24 BCNM are currently unknown. There is also uncertainty in estimating carbon stocks at the

1 National Forest level. However, forest inventory and carbon stock analysis performed by USFS  
2 does illustrate broad trends. Since 1990, the USFS estimates that the total carbon stock in  
3 national forests in Colorado has slightly increased, but the carbon stock in the PSICC has  
4 decreased over this time (USFS No Date), highlighting the need to acknowledge the non-market  
5 benefit of carbon sequestered by the vegetation in BCNM.

6 In summary, the drivers and stressors for terrestrial vegetation in BCNM are the following:

- 7 • Increased recreational use, resulting from population growth in Chaffee County and  
8 Colorado and increased visitation to BCNM, will likely lead to increased physical  
9 disturbances of vegetation. Motorized and non-motorized travel, as well as dispersed  
10 camping within the river corridor and upland areas may increase trampling and denuding  
11 of vegetation and wood cutting and collection for campfires. These activities could  
12 damage native plant communities and result in the transport of noxious plant species.
- 13 • Forest die-offs associated with drought and rising temperatures are likely to continue into  
14 the future. Drought will likely become more frequent with climate change, but even  
15 without more frequent drought, higher temperatures could exacerbate tree water stress  
16 (Adams et al. 2017).
- 17 • Forest die-offs from insect and disease infestations exacerbated by drought and/or climate  
18 change are likely continued on the regional level and expand into the BCNM.

#### 19 **2.1.7.5 Existing Management Direction**

20 Table 1-2 lists relevant, existing Federal, state, and local management direction for terrestrial  
21 vegetation. In addition, BLM Management Objectives and Direction from the 1996 RGRMP and  
22 USFS Management Prescriptions from the 1984 PSICC LRMP that are specific to terrestrial  
23 vegetation are presented below.

#### 24 **BLM Royal Gorge Resource Area RMP (Eco-Subregion 1, Arkansas River)**

##### 25 Objective Decisions

- 26 • Vegetation management will be as follows:
  - 27 ○ Vegetation will be managed to accomplish other BLM initiatives i.e., Riparian,  
28 Wildlife, etc;
  - 29 ○ Improved forage conditions will be distributed through cooperative efforts i.e.,  
30 Colorado Habitat Partnership Program;
  - 31 ○ Management of forest lands will be for enhancement of other values;
  - 32 ○ Desired Plant Condition objectives will be developed for all Integrated Activity  
33 Plans (IAPs);
  - 34 ○ Vegetation monitoring will be accomplished on an interdisciplinary basis.

##### 35 Allocation Decisions

- 1       • A portion of the forested lands will be available for intensive management.

2   Action Decisions

- 3       • Productive forested lands will be managed for sustained yield.

4   **USFS Management Area 2B Prescription**

5   Silvicultural Prescriptions

6       01     Manage tree stands using both commercial or noncommercial methods enhance visual  
7             quality, diversity and insect and disease control

8       02     Manage forest cover types using the following harvest methods

9             - Clearcut in aspen and lodgepole,

10            - Shelterwood in interior ponderosa pine, mixed conifer and Engelmann spruce-  
11            subalpine fir

12            a . Apply harvest treatments to forest cover types as specified below on at least  
13            80 percent of the forest cover type up to 20 percent of the type may be treated using  
14            other harvest methods specified in Forest Direction

15            b . Silvicultural Standards (These standards may be exceeded on areas managed for  
16            old growth) [See USFS LRMP for detailed by-forest cover type silvicultural  
17            practices]

18       03     Apply intermediate treatments to maintain growing stock level standards

19       04     Utilize firewood material using both commercial and noncommercial methods

20       05     For management purposes, a cut-over area is considered an opening until such time as

21             - Increased water yield drops below 50 percent of the potential increase,

22             - Forage and/or browse production drops below 40 percent of potential production,

23             - Deer and elk hiding cover reaches 60 percent of potential,

24             - Minimum stocking standards by forest cover type and site productivity are met, and

25             - The area appears as a young forest rather than a restocked opening, and takes on the  
26             appearance of the adjoining characteristic landscape

27            a. When the Visual Quality Objective of an area is partial retention, the regenerated  
28            stand shall meet or exceed all of the following characteristics before a cutover area is  
29            no longer considered an opening [See USFS LRMP for detailed by-forest cover type  
30            stocking levels, tree heights, crown closure, and distribution

31   Reforestation

32       01     Use trees of the best genetic quality available which are adapted to the planting site  
33             when supplemental planting

1 **USFS Management Area 4B Prescription**

2 Silvicultural Prescriptions

- 3 01 Manage forest cover types to provide variety in stand sizes, shape, crown closure,  
4 edge contrast, age structure, and interspersion
- 5 02 Manage Forest cover types using the following harvest methods
- 6 - Clearcut in lodgepole pine and aspen,  
7 - Shelterwood in interior ponderosa pine and mixed conifer, and  
8 - Clearcut and/or selection (group or single-tree) in Engelmann spruce/subalpine- fir,  
9 according to the following criteria:
- 10 o Utilize the selection method where the objective is to perpetuate uneven-aged  
11 stand structure
- 12 o Utilize the clearcut method in even-aged stands located on north and east aspects,  
13 or on other aspects if Moist site conditions are present (subalpine fir/forest  
14 fleabane habitat type, for example) It should also be used in even-aged stands  
15 having above-average windfall risk
- 16 a. Apply harvest treatments to forest cover types as specified below on at least  
17 80 percent of the forest cover type Up to 20 percent of the type may be treated using  
18 other harvest methods specified in Forest Direction
- 19 b. Silvicultural Standards (These standards may be exceeded on areas managed for  
20 old growth) [*See USFS LRMP for detailed by-forest cover type silvicultural*  
21 *practices*]
- 22 03 Apply intermediate treatments to maintain growing stock level standards
- 23 04 Utilize firewood material using both commercial and noncommercial methods
- 24 05 For management purposes, a cut-over area is considered an opening until such time as
- 25 - Increased water yield drops below 50 percent of the potential increase,  
26 - Forage and/or browse production drops below 40 percent of potential production,  
27 - Deer and elk hiding cover reaches 60 percent of potential,  
28 - Minimum stocking standards by forest cover type and site productivity are met, and  
29 - The area appears as a young forest rather than a restocked opening, and takes on the  
30 appearance of the adjoining characteristic landscape
- 31 a. When the Visual Quality Objective of an area is modification or maximum  
32 modification, the regenerated stand shall meet or exceed all of the following  
33 characteristics before a cutover area is no longer considered an opening [*See USFS*  
34 *LRMP for detailed by-forest cover type stocking levels, tree heights, crown closure,*  
35 *and distribution*]



1 Reforestation

- 2       01     Use trees of the best genetic quality available which are adapted to the planting site  
3             when supplemental planting

4 **USFS Management Area 4D Prescription**

5 Diversity on National Forests and National Grasslands

- 6       01     Maintain aspen clones

7 Silvicultural Prescriptions

- 8       01     Manage aspen forest cover type to perpetuate aspen using even-aged silviculture  
9             a. Silvicultural Standards (These standards may be exceeded on areas managed for  
10             old growth) [*See USFS LRMP for detailed by-forest cover type silvicultural*  
11             *practices*]  
12       02     Utilize firewood material using both commercial and noncommercial methods  
13       03     For management purposes, a cut-over area is considered an opening until such time as  
14             - Increased water yield drops below 50 percent of the potential increase,  
15             - Forage and/or browse production drops below 40 percent of potential production,  
16             - Deer and elk hiding cover reaches 60 percent of potential,  
17             - Minimum stocking standards by forest cover type and site productivity are met, and  
18             - The area appears as a young forest rather than a restocked opening, and takes on the  
19             appearance of the adjoining characteristic landscape  
20             a. When the Visual Quality Objective of an area is modification or maximum  
21             modification, the regenerated stand shall meet or exceed all of the following  
22             characteristics before a cutover area is no longer considered an opening [*See USFS*  
23             *LRMP for detailed by-forest cover type stocking levels, tree heights, crown closure,*  
24             *and distribution*]

25 **USFS Management Area 5B Prescription**

26 Silvicultural Prescriptions

- 27       01     Manage forest cover types to achieve and maintain desired thermal and hiding cover,  
28             cover-opening ratios, and other habitat needs associated with tree cover  
29       02     Manage Forest Cover Types using the following harvest methods  
30             - Clearcut in lodgepole and aspen,  
31             - Shelterwood in interior ponderosa pine and mixed conifer, and  
32             - Selection (group or single tree) in Engelmann spruce-subalpine fir

- 1 a. Apply harvest treatments to forest cover types as specified below on at least  
2 80 percent of the forest cover type Up to 20 percent of the type may be treated using  
3 other harvest methods specified in Forest Direction
- 4 b. Silvicultural Standards (These standards may be exceeded on areas managed for  
5 old growth) [See USFS LRMP for detailed by-forest cover type silvicultural  
6 practices]
- 7 03 Utilize firewood material using both commercial and noncommercial methods
- 8 04 For management purposes, a cut-over area is considered an opening until such time as  
9 - Increased water yield drops below 50 percent of the potential increase,  
10 - Forage and/or browse production drops below 40 percent of potential production,  
11 - Deer and elk hiding cover reaches 60 percent of potential,  
12 - Minimum stocking standards by forest cover type and site productivity are met, and  
13 - The area appears as a young forest rather than a restocked opening, and takes on the  
14 appearance of the adjoining characteristic landscape
- 15 a. When the Visual Quality Objective of an area is modification or maximum  
16 modification, the regenerated stand shall meet or exceed all of the following  
17 characteristics before a cutover area is no longer considered an opening [See USFS  
18 LRMP for detailed by-forest cover type stocking levels, tree heights, crown closure,  
19 and distribution]

20 **USFS Management Area 6B Prescription**

21 Silvicultural Prescriptions

- 22 01 Maintain and manage forested inclusions to provide a high level of forage production,  
23 wildlife habitat, and diversity
- 24 02 Manage Forest cover types using the following harvest methods
- 25 - Clearcut in aspen and lodgepole pine,  
26 - Shelterwood in interior ponderosa pine and mixed conifer,  
27 - Clearcut and/or shelterwood in Engelmann spruce/subalpine fir, according to the  
28 following criteria
- 29 ○ Utilize the shelterwood method on south and west aspects to provide seed and  
30 shade protection if windfall risk is below average It can also be used on other  
31 aspects when cold, draughty sites are present (Engelmann spruce/moss habitat  
32 type, for example)
- 33 ○ Utilize the clearcut method on north and east aspects, or on other aspects if moist  
34 site conditions are present (subalpine fir/forest fleabane habitat type, for example)  
35 It should also be used on sites where windfall risk is above average

- 1 a. Apply harvest treatments to forest cover types as specified below on at least  
 2 80 percent of the forest cover type Up to 20 percent of the type may be treated using  
 3 other harvest methods specified in Forest Direction
- 4 b. Silvicultural Standards [See USFS LRMP for detailed by-forest cover type  
 5 *silvicultural practices*]
- 6 03 Utilize firewood material using both commercial and noncommercial methods
- 7 04 For management purposes, a cut-over area is considered an opening until such time as  
 8 - Increased water yield drops below 50 percent of the potential increase,  
 9 - Forage and/or browse production drops below 40 percent of potential production,  
 10 - Deer and elk hiding cover reaches 60 percent of potential,  
 11 - Minimum stocking standards by forest cover type and site productivity are met, and  
 12 - The area appears as a young forest rather than a restocked opening, and takes on the  
 13 appearance
- 14 a. When the Visual Quality Objective of an area is modification or maximum  
 15 modification, the regenerated stand shall meet or exceed all of the following  
 16 characteristics before a cutover area is no longer considered an opening [See USFS  
 17 LRMP for detailed by-forest cover type stocking levels, tree heights, crown closure,  
 18 and distribution]

19 **2.1.7.6 Needs for Change and Management Opportunities**

20 Given the resource conditions and trends and existing management in BCNM, Table 2-16  
 21 summarizes needs for change and management opportunities to consider in the BCNM MP-EIS.

22 **Table 2-16 Needs for Change and Management Opportunities for Vegetation**

Needs for Change	Management Opportunities
<p>The potential for increasing recreational use in BCNM resulting from population growth and following publicity around its designation may increase the potential for physical disturbance to vegetation and the transport of noxious weeds.</p>	<p>Limit the disturbance of native plant communities from increased recreational use, including off-road or off-trail transportation (i.e. unauthorized routes) and dispersed camping.</p> <p>Establish science partnerships, advance remote sensing for vegetation measurement (LiDAR, hyperspectral, etc), expand USFS terrestrial vegetation plots, undertake noxious weed inventory and other monument vegetation mapping. Identify and characterize understory ROV's across monument plant communities to compliment USFS mapped vegetation GIS data.</p> <p>Implement integrated pest management practices for the control of noxious weeds.</p> <p>Amend existing BLM and USFS management plans to ensure consistent prescription across the BCNM.</p>

Forest die-offs associated with increasing temperatures, drought, and insect and disease infestations would add to the increased risk of overall ecosystem degradation within the BCNM.	Manage native vegetation communities, especially mixed conifer communities towards a condition within the natural range of variability through vegetation treatments (e.g., thinning, prescribed burns) to limit the spread of insect and disease infestations and reduce fuel loads for wildfire.  Identify climate change adaptation strategies for vegetation management, which may include identifying communities in climate refugia and linkages, proactively managing for resilience to climate change effects, and facilitating transformation to or away from existing vegetation communities in non-refugia sites.
---	--

1 **2.1.8 Wildland Fire Ecology**

2 Wildland fire is a natural system driver in arid western terrestrial ecosystems. Historically, it has  
3 acted as a natural disturbance agent sustaining various vegetation communities within a natural  
4 range of variability in terms of structure and composition. Different vegetation may have  
5 different fire regimes, or the typical fire interval and severity that occurs with vegetation and  
6 climatic conditions. The range of elevation in the BCNM creates various vegetation communities  
7 and, in turn, a range of historic fire regimes that vary in fire frequency and severity. For example,  
8 the spruce-fir forests that comprise the higher elevations of the BCNM generally experienced  
9 infrequent, stand-replacing fires while the mixed conifer forests at lower elevations experienced  
10 a more moderate fire regime with more frequent, but less severe (mixed-severity) fire. The  
11 current conditions in the BCNM, as is the case across much of the West, have departed from  
12 historic fire regime condition, with fire suppression over many decades contributing to increased  
13 fuel loads in the BCNM that can make future fires larger and more severe. Future management  
14 may need to consider these conditions in light of protecting BCNM ROVs and human health and  
15 safety.

16 Planning issues and management concerns based on Proclamation 9232 and additional agency  
17 concerns include:

- 18 • How does BLM and USFS respond to BCNM wildland fire behavior and changed  
19 wildfire event risk resulting from current forest die off, insects, disease, and long-term  
20 trends in temperature and precipitation?
- 21 • • What role should fire play in the monument and the WSA?
- 22 • • What treatments are necessary to reduce the impacts associated with fire, insects, non-  
23 native/invasive species, and disease?

24 **2.1.8.1 Assessment Area**

25 The geographic area considered for characterizing conditions and trends of wildland fire ecology  
26 is larger than the BCNM boundary to adequately address the interrelationships between  
27 conditions in the BCNM and the broader landscape at which the trends and drivers of wildland  
28 fire ecology operate. This broader landscape unit is defined by the LANDFIRE data as the East

1 Arkansas Landscape Unit (LU), which encompasses the BCNM. The East Arkansas LU lies in  
2 the southern end of the Buffalo Peaks area in the East Arkansas Foothills between Buena Vista  
3 and South Park and south to the Arkansas River near Cotopaxi. The LU encompasses  
4 approximately 423,500 acres.

5 **2.1.8.2 Best Available Scientific Information**

6 The Best Available Scientific Information for wildland fire ecology and management in the  
7 assessment area includes historic records of fires that have occurred in the BCNM and  
8 LANDFIRE spatial data for the East Arkansas LU, which encompasses the BCNM. LANDFIRE  
9 spatial data is the best available science to describe or characterize the condition of existing  
10 wildland fire conditions and trends within the assessment area. These data include the following  
11 GIS layers and reports that are used to describe wildland fire conditions and trends:

12 Balch, J.K., B.A. Bradley, J.T. Abatzoglou, R.C. Nagy, E.J. Fusco, and A.L. Mahood. Human-  
13 started wildfires expand the fire niche across the United States. PNAS 114(11): 2946-2951.

14 J.W. Associates, Inc. 2011. Upper Arkansas Wildfire/Watershed Assessment: Prioritization of  
15 Watershed-Based Risks to Water Supplies. Final Report. April.

16 Lukas, J., J Barsugli, N. Doesken, I. Rangwala, and K. Wolter. Climate Change in Colorado: A  
17 Synthesis to Support Water Resources Management and Adaptation. Second Edition. A  
18 Report for the Colorado Water Conservation Board Western Water Assessment, Cooperative  
19 Institute for Research in Environmental Sciences (CIRES), University of Colorado Boulder.  
20 August.

21 U.S. Department of the Interior (DOI), U.S. Department of Agriculture (USDA), Department of  
22 Energy (DOE), Department of Department of Defense, Department of Commerce, U.S.  
23 Environmental Protection Agency (USEPA), Federal Emergency Management Agency  
24 (FEMA), National Association of State Foresters (NASF). 2001. Review and Update of the  
25 1995 Federal Wildland Fire Management Policy. January 2001. 86 pp.

26 USDA and DOI . 2002. A Collaborative Approach for Reducing Wildland Fire Risks to  
27 Communities and the Environment: 10-Year Comprehensive Strategy Implementation Plan.  
28 May 2002. U.S. Department of Agriculture and U.S. Department of the Interior.

29 USFS. 2008. Interagency Prescribed Fire Planning and Implementation Procedures Guide. July  
30 2008. Washington, DC: U.S. Department of Agriculture and U.S. Department of the Interior.

31 USFS. 2009. Guidance for Implementation of Federal Wildland Fire Management Policy.  
32 February 13, 2009. Washington, DC: U.S. Department of Agriculture and U.S. Department of  
33 the Interior.

34 USFS. 2015. Pike-San Isabel National Forest, Comanche/Cimarron National Grasslands: 2015  
35 Wildfire Decision Support Guide.

1 USFS. 2016. 2016 Forest Health Annual Aerial Survey Report. Rocky Mountain Region.  
2 Available online at: <https://www.fs.usda.gov/main/r2/forest-grasslandhealth>. Accessed  
3 December 4, 2017.

4 USFS. 2017. Browns Canyon National Monument Management Planning Specialist Assessment  
5 Report and Notes by Andrew White. Working draft dated July 15, 2017.

## 6 **GIS Data**

- 7 • USGS LANDFIRE 2014 Historical Percent of Low Severity Fires, US\_140PLS,  
8 LANDFIRE 1.4.0. Available: <https://www.landfire.gov/index.php>. Accessed: August 10,  
9 2017.
- 10 • USGS LANDFIRE 2014 Historical Percent of Mixed Severity Fires, US\_140PMS,  
11 LANDFIRE 1.4.0. Available: <https://www.landfire.gov/index.php>. Accessed: August 10,  
12 2017
- 13 • USGS LANDFIRE 2014 Historical Percent of Replacement Severity Fires, US\_140PRS,  
14 LANDFIRE 1.4.0. Available: <https://www.landfire.gov/index.php>. Accessed August 10,  
15 2017
- 16 • USGS LANDFIRE 2014 Fire Regime Groups, US\_140FRG, LANDFIRE 1.4.0.  
17 Available: <https://www.landfire.gov/index.php>. Accessed: August 10, 2017.
- 18 • USGS LANDFIRE 2014 Mean Fire Return Interval. US\_140FRI, LANDFIRE 1.4.0.  
19 Available: <https://www.landfire.gov/index.php>. Accessed: August 10, 2017
- 20 • USGS LANDFIRE 2014 Succession Classes, US\_140SCCLASS, LANDFIRE 1.4.0.  
21 Available: <https://www.landfire.gov/index.php>. Accessed: August 10, 2017
- 22 • USGS LANDFIRE 2014 Vegetation Condition Class, US\_140VCC, LANDFIRE 1.4.0.  
23 Available: <https://www.landfire.gov/index.php>. Accessed: August 10, 2017

### 24 **2.1.8.3 Limitations/Data Gaps**

25 Actual field verified stand exam and other fuel loading data does not exist for the assessment  
26 area. Therefore, the description of wildfire ecology and trends relies on documented fire history  
27 in the area, and LANDFIRE spatial modeling data.

28 LANDFIRE data are designed to be used at a landscape-scale in support of strategic vegetation,  
29 fire, and fuels management planning for large sub-regional landscapes such as significant  
30 portions of states or multiple federal administrative entities. The BCNM boundary is at the lower  
31 size limit for where LANDFIRE data can be meaningfully applied and investigation by local and  
32 regional experts should be conducted to inform decisions regarding local applicability prior to  
33 implementing management decisions. However, the data does provide useful information to  
34 consider and evaluate existing and possible future conditions and trends across the BCNM and  
35 where changes in management may be necessary.

**2.1.8.4 Existing Conditions and Trends**

Historic fires documented in the BCNM and LANDFIRE spatial data, including fire regime and return interval and vegetation condition class, are the indicators that inform the discussion on existing conditions and trends of wildland fire ecology in the BCNM.

**Fire History**

There have been 25 fires between 1970 and 2016 within the BCNM boundary (USFS 2017). Sixteen of these fires occurred on USFS-administered land, and nine occurred on BLM-administered land. Twenty-three were caused by lightning and two were caused by humans. Fires within this area have had differing types of fire response. Most fires on USFS lands have been suppressed, while fires on BLM lands within the BLM Wilderness Study Area have either been suppressed or allowed to burn naturally for resource benefits while being monitored. All but one of the documented fires that have occurred in BCNM have been relatively small, burning 2 acres or less. One fire in 1994 burned 13 acres.

**Fire Regime and Return Interval**

Fire regime grouping is intended to characterize the presumed historical fire regimes in landscapes based on interactions between vegetation dynamics, fire spread, fire effects, and spatial context. Fire Regime Groups and their proportion of the BCNM are summarized in Table 2-17.

**Table 2-17 Fire Regime Groups in BCNM**

<b>Fire Regime Group</b>	<b>Average Return Interval</b>	<b>Severity</b>	<b>Proportion of BCNM (percent)</b>
I	Less than or equal to 35 Year Fire Return Interval	Low and Mixed Severity	32
II	Less than or equal to 35 Year Fire Return Interval	Replacement Severity	0
III	35 - 200 Year Fire Return Interval	Low and Mixed Severity	40
IV	35 - 200 Year Fire Return Interval	Replacement Severity	7
V	Greater than 200 Year Fire Return Interval	Any Severity	20

Source: LANDFIRE 2014

Low severity, mixed severity, and replacement severity are defined as less than 25 percent, 25 to 75 percent, and greater than 75 percent average top-kill within a typical fire perimeter for a given vegetation type, respectively.

1 LANDFIRE data also models the Mean Fire Return Interval, which quantifies the average period  
 2 between fires under the presumed historical fire regime. Table 2-18 summarizes the Mean Fire  
 3 Return Interval classifications in the BCNM.

4 **Table 2-18 Mean Fire Return Intervals in BCNM**

Mean Fire Return Interval (years)	Proportion of BCNM (percent)
0 – 25	16
25 – 50	17
50 – 100	18
100 – 200	29
200 – 300	20

5 Source: LANDFIRE 2014

6 These data indicate that under a historical fire regime, or a natural range of variability, over half  
 7 of the BCNM would burn at a frequency of 100 years or less.

8 **Vegetation Condition Class**

9 Vegetation Condition Class indicates the general level to which current vegetation is different  
 10 from the simulated historical vegetation reference conditions under the presumed historic fire  
 11 regimes. It characterizes changes in vegetation structure and composition resulting from changes  
 12 in fire regime. Table 2-19 summarizes the Vegetation Condition Classes present in the BCNM.

13 **Table 2-19 Vegetation Condition Class in BCNM**

Vegetation Condition Class (VCC)_	Percent of BCNM
VCC I. A: Very Low, Vegetation Departure (VDEP) 0 – 16 percent	0
VCC I. B: Low, VDEP 17 – 33 percent	47
VCC II. A: Moderate to Low, VDEP 34 – 50 percent	11
VCC II. B: Moderate to High, VDEP 51 – 66 percent	38
VCC III. A: High, VDEP 67 – 83 percent	0
VCC III. B: Very High, VDEP 84 – 100 percent	0

14 Source: LANDFIRE 2014

15 The use of Vegetation Condition Class data provides a tool for the measurement of departure  
 16 from a range of normal variability to target conditions where further actions may be necessary to  
 17 move the landscape to an improved vegetation condition class that is closer to, or within, the  
 18 natural range of variability that would sustain a more resilient wildfire ecological state.

19 The Vegetation Condition Classes present in BCNM indicate a moderate level of departure from  
 20 a natural range of variability previously sustained by historical fire regimes. This departure



1 means that much of BCNM has a higher level of fuels than what was present historically within  
2 the natural range of variability. Increased fuel loads contribute to a higher potential for larger,  
3 more severe fires than what would have typically occurred under historic fire regimes.

4 A wildfire/watershed assessment for the Upper Arkansas River basin completed in 2011  
5 categorized sixth-level watersheds in the basin according to their wildfire hazard. Of the  
6 10 watersheds intersecting BCNM, the assessment ranked five as having a moderate wildfire  
7 hazard (Railroad Gulch, Herring Creek, Ute Creek-Arkansas River, Trout Creek, Little  
8 Cottonwood Creek-Arkansas River, Wagon Tongue Creek-Badger Creek) and five as having a  
9 moderate to low wildfire hazard (Headwaters Badger Creek, Cottonwood Creek-Arkansas River,  
10 Rye Slough, Browns Canyon, Squaw Creek-Arkansas River (J.W. Associates Inc. 2011).

11 Wildland fire is a disturbance agent that was historically an ecological system driver in the  
12 assessment area. Several stressors have affected trends in wildland fire conditions in Colorado  
13 and have affected or are anticipated to affect conditions the assessment area. These stressors  
14 include the following:

- 15 • Human fire suppression alters fire regimes that lead to vegetation conditions, including  
16 overgrown forests and higher fuel levels, outside of a natural range of variability.
- 17 • Climate change, including an increase by 2°F in Colorado’s annual average temperature  
18 and increased drought conditions (Lukas et al. 2014), lowers fuel moisture levels and  
19 contributes to the potential for larger, more severe fires.
- 20 • Insect infestations, including mountain pine beetle and spruce beetle (USFS 2016)  
21 exacerbated by dense tree stands and drought conditions, are resulting in large-scale stand  
22 die-off that further contributes to higher fuel loading and alters fire conditions and  
23 behavior.
- 24 • Human-caused ignitions, especially from recreational use in forested areas, is increasing  
25 the potential for fire to occur (Balch et al. 2017) in areas with fire conditions outside of a  
26 historic range of variability where larger, more severe fires have a higher potential to  
27 occur.

#### 28 **2.1.8.5 Existing Management Direction**

##### 29 **BLM**

30 The RGRMP (BLM 1996) was amended for public land health in 1997 (BLM 1997). This  
31 amendment changed the decisions to allow prescribed fire and prescribed natural fire to be used  
32 as management tools to enhance resources. This was to clarify that fire prescriptions may also be  
33 written for natural ignitions. The 1997 RMP amendment also includes the following  
34 management decisions for wildland fire ecology and management:

- 35 • The desired plant community will be described and fire projects will be initiated through  
36 Integrated Activity Plans prior to fire prescription.

- 1       • A specific burn plan will be prepared, including NEPA documentation, in advance of a  
2       prescribed burn.

3   **USFS**

4   The PSICC LRMP (USFS 1984), as amended (Number 6 and 32), includes the following  
5   management direction:

6   Fire Protection

7   Protect life, property, and resource values from wildfire in a cost-efficient manner that  
8   maximizes the benefits of shared resources and developing technologies (Forest Service Manual  
9   [FSM] 5100).

- 10       • Planned budgets and programs are based on an analysis of efficiency and public concern.  
11       • Fiscal year fire program activities are based on a cost-efficient analysis of the budget.  
12       • Wildfire suppression is based on least cost plus damages with consideration

13   Prescribed Fire

14   Prescribed fire will be utilized as a vegetative fuels management technique where it is the most  
15   cost efficient and acceptable alternative to achieve management objectives (Forest Service  
16   Manual [FSM] 5140).

- 17       • A historical record will be maintained with each prescribed fire plan which documents  
18       the biological and physical effects and the fire behavior which produced the effects.  
19       • Utilize current technologies to achieve an optimum balance between positive and  
20       negative effects, and prevent escaped fires.  
21       • Wildfire suppression is based on least cost plus damages with consideration for public  
22       concerns.

23   Vegetation Treated by Burning

24   Use unplanned ignitions on areas identified in this Plan to achieve management objectives.

- 25       • Naturally-ignited wildfires may be used in predetermined areas under specified  
26       conditions to achieve the following management objectives:  
27           ○ Reduce the occurrence and/or adverse impacts of potential catastrophic wildfires  
28           over the long-term.  
29           ○ Maintain or restore the ecological composition, structure and functioning of fire-  
30           dependent ecosystems.  
31       • Naturally-ignited wildland fires may be used to achieve management objectives under  
32       conditions specified in an approved fire management plan, in the following areas:  
33           ○ All Wilderness Areas within the Pike and San Isabel National Forests

- 1           ○ All National Forest lands in the Wet Mountains, along the east slope of the Sangre
- 2           de Cristo Range, and in the Spanish Peaks.

**3   2.1.8.6   Needs for Change and Management Opportunities**

4   Given the resource conditions and trends and existing management in BCNM, Table 2-20  
 5   summarizes needs for change and management opportunities to consider in the BCNM MP.

**6   Table 2-20 Needs for Change and Management Opportunities for Wildland Fire Ecology**

Needs for Change	Management Opportunities
Vegetation class conditions that have departed from historic fire regime conditions, increasing the potential for larger, more severe fires.	Perform vegetation treatments with a range of management actions including mechanical treatments, prescribed fire, and naturally-ignited fires to alter those Vegetation Condition Classes furthest from historic fire regime conditions to return them to, or move them towards, the natural range of variability and historic fire regime conditions.
Increasing recreational use in BCNM will increase the potential for human-caused ignitions.	Reduce the risk of human-caused ignitions in BCNM through increased public awareness and use restrictions.
Fire management in BCNM is influenced by rugged terrain and lack of roads, ROV protection, human health and safety, and multiple jurisdictional and management designation boundaries, potentially increasing the complexity of determining the appropriate response to fires.	Prepare a fire management plan for BCNM to maximize the effectiveness of fire response in consideration of protecting ROVs and human health safety.

7

**8   2.1.9   Wetlands and Riparian Resources**

9   The vegetative composition of the BCNM is diverse; scattered pockets of aspen (*Populus*  
 10 *tremuloides*), willow (*Salix*), Rocky Mountain juniper (*Juniperus scopulorum*), river birch  
 11 (*Betula nigra*), and narrowleaf cottonwood (*Populus angustifolia*) can be found in riparian areas.  
 12 The Browns Canyon area represents one of the only riparian ecosystems along the Arkansas  
 13 River that remains relatively undisturbed and contains an intact biotic community.

14 Wetland and riparian areas in the Arkansas Valley region have been altered by historic  
 15 development, mining, and grazing activities. In addition, increased recreational use for activities  
 16 like camping and water-based recreation has resulted in disturbances to riparian resources  
 17 through trampled vegetation and modified stream banks. Warmer and drier climate conditions  
 18 are also likely to reduce the extent, and degrade the conditions of, wetlands and riparian areas in  
 19 the future; these effects are expected to be greatest at lower elevations. Future management may  
 20 need to focus on protecting vulnerable wetland and riparian resources through careful  
 21 management of recreation and other authorized uses within the BCNM.

22 ROVs for wetland and riparian resource include the following:

- 1 • Browns Canyon harbors a wealth of scientifically significant resources, including  
2 ecological and riparian resources.
- 3 • The topographic and geologic diversity of the Browns Canyon area has allowed the  
4 establishment of various vegetative communities, including areas riparian areas  
5 containing aspen, willow, Rocky Mountain juniper, river birch, and narrow leaf  
6 cottonwood.

7 Planning issues and management concerns based on Proclamation 9232 and additional agency  
8 concerns include:

- 9 • What BLM or USFS decisions are necessary to protect BCNM riverine, riparian, and  
10 ephemeral drainage hydrologic function, ecological productivity response to increased  
11 temperatures, long-term drought, reduced snowpacks, or extreme precipitation events?
- 12 • How does BLM and USFS manage BCNM emergent springs, wetlands soil compaction,  
13 terrestrial upland meadow plant community successional state, ecological integrity,  
14 productivity, concentrated livestock use?

#### 15 **2.1.9.1 Assessment Area**

16 The geographic area considered for characterizing conditions and trends of riparian and wetland  
17 is the BCNM boundary.

#### 18 **2.1.9.2 Best Available Scientific Information**

19 Best available scientific information for wetlands and riparian areas includes the following  
20 scientific literature and reports listed below. References that are laws, orders, handbooks, or  
21 LUPs are stated one time in Table 1-2 to reduce redundancy.

22 BLM. 1998. A user Guide to Assessing Proper Functioning Condition and the Supporting Science  
23 for Lotic Areas. Technical Reference 1737-15. Available at:  
24 <https://www.blm.gov/or/programs/nrst/files/Final%20TR%201737-15.pdf>. Accessed January  
25 2, 2018.

26 BLM. Properly Functioning Condition Data for Browns Canyon National Monument Planning  
27 Assessment. Transmitted by Joseph Vieira January 8, 2018.

28 Colorado Department of Natural Resources, et al. 2000. Arkansas River Water Needs  
29 Assessment. July. Available:  
30 [file:///C:/Users/37601/Downloads/FOM\\_Smith\\_2000\\_ArkansasRiverWaterNeedsAssesment.p](file:///C:/Users/37601/Downloads/FOM_Smith_2000_ArkansasRiverWaterNeedsAssesment.pdf)  
31 [df](file:///C:/Users/37601/Downloads/FOM_Smith_2000_ArkansasRiverWaterNeedsAssesment.pdf).

32 Colorado Natural Heritage Program (CNHP). 2000. Comprehensive Statewide Wetlands  
33 Classification and Characterization. Colorado Natural Heritage Program, Colorado State  
34 University, Fort Collins, Colorado. June 2000.

- 1 Colorado Natural Heritage Program (CNHP). 2003. Statewide Wetlands Classification and  
2 Characterization. Wetland Plant Associations of Colorado. Colorado Natural Heritage  
3 Program, Colorado State University, Fort Collins, Colorado. April 2003.
- 4 Colorado Natural Heritage Program (CNHP). 2007. Assessment of Ecological Condition of  
5 Headwater Wetlands in the Southern Rocky Mountains Using a Vegetation Index of Biotic  
6 Integrity. Colorado Natural Heritage Program, Colorado State University, Fort Collins,  
7 Colorado. May 22, 2007.
- 8 Colorado Natural Heritage Program (CNHP). 2015. Climate Change Vulnerability Assessment  
9 for Colorado Bureau of Land Management. K. Decker, L. Grunau, J. Handwerk, and J.  
10 Siemers, editors. Colorado Natural Heritage Program, Colorado State University, Fort Collins,  
11 Colorado. Available at:  
12 [http://www.cnhp.colostate.edu/download/documents/2015/CCVA\\_for\\_Colorado\\_BLM\\_final.](http://www.cnhp.colostate.edu/download/documents/2015/CCVA_for_Colorado_BLM_final.pdf)  
13 pdf Accessed on October 23, 2017.
- 14 Cowardin, Lewis; Carter, Virginia; Golet, Francis; and, LaRoe, Edward. 1979. Classifications of  
15 Wetlands and Deepwater Habitats of the United States. U.S. Department of the Interior, Fish  
16 and Wildlife Service.
- 17 Damm, Mary and Stevens, Joe. Undated. Assessment of the Riparian Vegetation and Wildlife  
18 Habitat Structure. North Fork of the Gunnison River Tributaries and Lower Gunnison River  
19 Tributaries. Colorado Natural Heritage Program, Colorado State University.
- 20 Industrial Economics, Incorporated (IEc). 2006. Upper Arkansas River Basin Natural Resource  
21 Damage Assessment. Preliminary Estimate of Damages. December 2006.
- 22 Sanchez, Steven. 2017. U.S. Forest Service. Browns Canyon National Monument Management  
23 Planning Specialist Assessment Report and Notes. Working draft dated July 15, 2017.
- 24 U.S. Environmental Protection Agency (EPA). 2017. Letter to the Salida Ranger District Re:  
25 Browns Canyon National Monument Planning Assessment. June 27, 2017.

26 **GIS Data**

- 27 • USFWS National Wetlands Inventory, CO\_Wetlands. Available:  
28 <https://www.fws.gov/wetlands/>. Accessed: September 14, 2017.
- 29 • USGS National Hydrography Dataset, NHDFlowline. Available:  
30 <https://nhd.usgs.gov/data.html>. Accessed: October 2, 2017.
- 31 • USGS National Hydrography Dataset, NHDWaterbody.. Available:  
32 <https://nhd.usgs.gov/data.html>. Accessed: October 2, 2017.
- 33 • USGS National Watershed Boundary Dataset, WBDHU12. Available:  
34 <https://nhd.usgs.gov/data.html>. Accessed: October 2, 2017.

1 **2.1.9.3 Limitations/Data Gaps**

2 The following data are used to assess and quantify existing conditions and trends for wetlands  
3 and riparian resources in BCNM:

- 4 • USFWS National Wetland Inventory (NWI) Data
- 5 • BLM Properly Functioning Condition data
- 6 • BLM RGFO Wetland and Riparian Database
- 7 • Colorado Natural Heritage Program wetland data
- 8 • USGS National Hydrography Dataset

9 This planning assessment uses the NWI dataset and the USFS GIS Vegetation Layer to quantify  
10 the spatial extent of wetlands and riparian resources within the BCNM. The intent of the NWI is  
11 to map wetlands and riparian areas at the reconnaissance-level and without field verification, in  
12 most cases. The maps are prepared from the analysis of high altitude imagery. Wetlands are  
13 identified based on vegetation, visible hydrology, and geography. A margin of error is inherent  
14 in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in  
15 revision of the wetland boundaries or classification established through image analysis. In  
16 addition, wetlands or other mapped features may have changed since the date of the imagery  
17 and/or field work. There may be occasional differences in polygon boundaries or classifications  
18 between the analysis of the imagery and the actual conditions on site. Similarly, the USFS GIS  
19 Vegetation Layer could miss small patches of vegetation, smaller than the minimum mapping  
20 unit in the mapping and GIS modeling process. The mapped vegetation and vegetation surveys  
21 conducted since the BCNM designation offer a “snapshot” of current conditions, not information  
22 on trends or changing conditions over time. Therefore, the planning assessment uses other  
23 sources, including best available science and government and/or management reports for riparian  
24 and wetland areas within the BCNM, to supplement the planning assessment. These other  
25 sources include research and survey data for riparian and wetland areas by the BLM, USFS, and  
26 Colorado Natural Heritage Program that are applicable to the BCNM.

27 **2.1.9.4 Existing Conditions and Trends**

28 Elevation, precipitation, gradient, land use, historic disturbance, plant species introduction,  
29 geology, and other variables are influential in setting wetland and riparian communities, as well  
30 as the condition of a particular location. Ruggedness and remoteness both contribute to  
31 preserving the condition of wetlands and riparian areas in BCNM. Wetlands and riparian areas  
32 nearer to communities, adjacent to well-used routes, or, in certain cases, that are more frequently  
33 grazed have the tendency to have a more impaired condition, including damaged or denuded  
34 vegetation, erosion, channelization, and presence of nonnative invasive plant species.

35 Figure 2-10 illustrates existing wetlands within the BCNM, based on NWI data. Wetland  
36 classifications and acreages are provided in Table 2-21. Wetlands within the BCNM boundary  
37 range from less than one acre to 224 acres in size and are classified as emergent, forested/shrub,

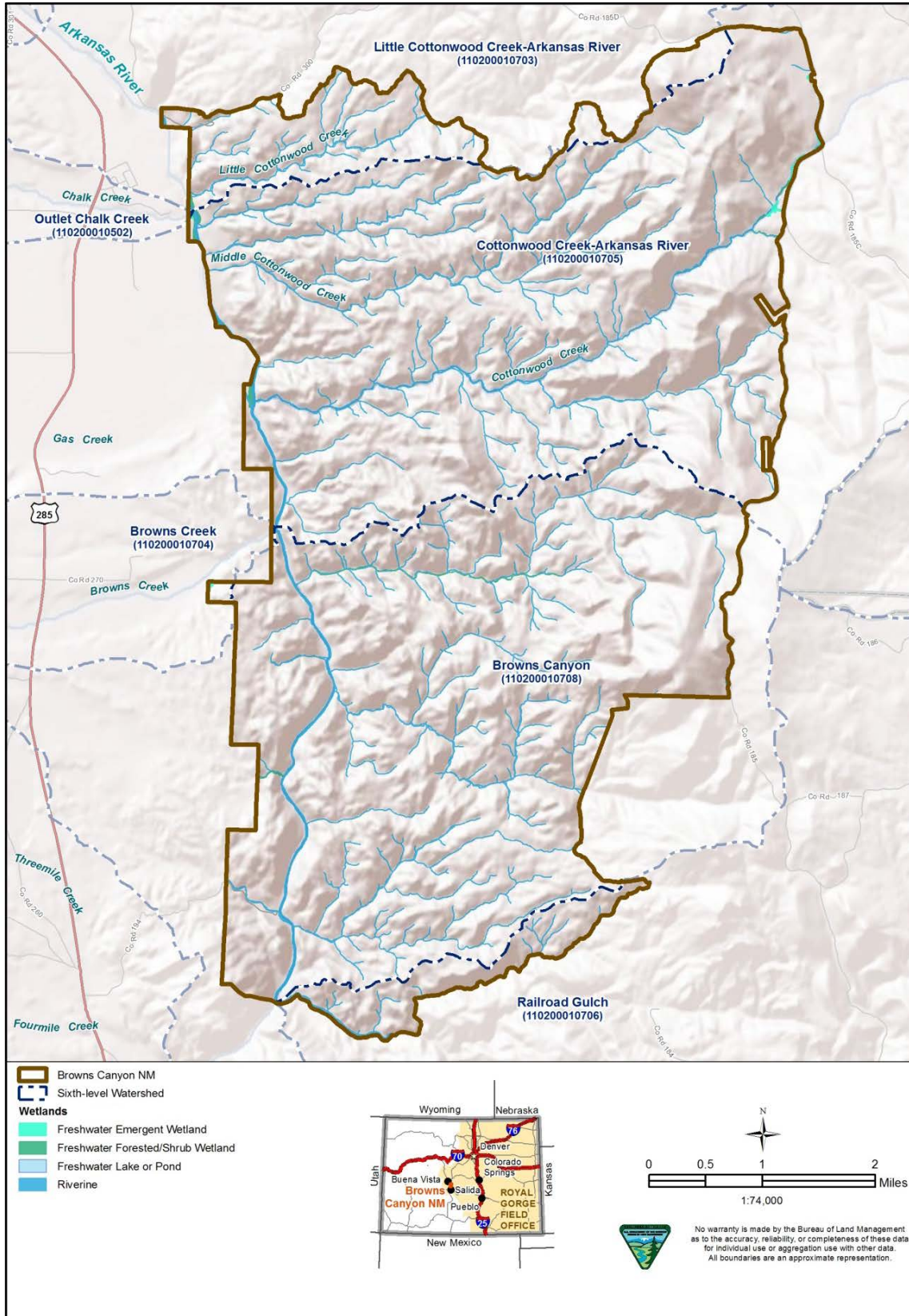
1 and riverine. Wetlands associated with the Arkansas River corridor and its tributaries comprise  
 2 the majority of the wetland areas within the BCNM, totaling 454.2 (92 percent) of all NWI  
 3 wetlands (Table 2-21).

**Table 2-21 Wetlands within BCNM**

Wetland Type	Cowardin Classification <sup>1</sup>	Acres
Freshwater Emergent Wetland	Palustrine, emergent, persistent, temporarily flooded (PEM1A)	7.4
	Palustrine, emergent, persistent, seasonally saturated, partially drained/ditched (PEM1Bd)	1.5
	Palustrine, emergent, persistent, seasonally flooded (PEM1C)	1.8
Freshwater Forested/Shrub Wetland	Palustrine, forested, broad-leaved deciduous, temporarily flooded (PFO1A)	0.2
	Palustrine, scrub-shrub, broad-leaved deciduous, temporarily flooded (PSS1A)	11.8
	Palustrine, scrub-shrub, broad-leaved deciduous, seasonally flooded (PSS1C)	15.5
Freshwater Pond	Palustrine, unconsolidated shore, temporarily flooded, diked/impounded (PUSAh)	0.2
Riverine	Riverine, upper perennial, unconsolidated bottom, intermittently exposed (R3UBG)	0.5
	Riverine, upper perennial, unconsolidated bottom, permanently flooded (R3UBH)	80.8
	Riverine, upper perennial, unconsolidated shore, seasonally flooded (R3USC)	2.2
	Riverine, intermittent, streambed, temporarily flooded (R4SBA)	136.1
	Riverine, intermittent, streambed, seasonally flooded (R4SBC)	224.4
	Riverine, unknown perennial, unconsolidated bottom, permanently flooded (R5UBH)	10.2
<b>Total Acreage</b>		<b>492.6</b>

Source: USFWS 2018

<sup>1</sup>The Cowardin classification system was devised for the USFWS by Cowardin et al. (1979). Additional information for each wetland code can be found at <https://www.fws.gov/wetlands/data/wetland-codes.html>.



1  
2 **Figure 2-10 Planning Area Waters within the National Monument Boundary BCNM**



1 The BLM uses Proper Function Condition Assessment (PFC) protocol (BLM 1998) to assess  
2 existing conditions and management effects on riparian and stream habitats. BLM Technical  
3 Reference 1737-15 (BLM 1998) defines the following PFC ratings:

- 4 • Proper Functioning Condition (PFC): assigned when a lotic riparian area has adequate  
5 vegetation, landform, or woody material capable of dissipating energy, capturing  
6 sediment, improving floodwater retention and groundwater recharge, develop root masses  
7 that stabilize streambanks, and it maintains channel characteristics.
- 8 • Functioning at-risk (FAR): assigned when the riparian area is in limited functioning  
9 condition and existing condition make them susceptible to impairment.
- 10 • Not Functioning (NF): assigned when the riparian is not functioning, not reducing  
11 erosion, and overall improving water quality.

12 During the field seasons of 2016-17, BLM and USFS completed PFC assessments for riparian  
13 habitat throughout the BCNM, as listed in Table 2-22. Within the BCNM boundary, perennial  
14 and intermittent stream channel reaches (and their associated riparian communities) range from  
15 pristine unaltered proper functioning condition (PFC) to functioning at risk (FAR) and non-  
16 functional (NF) (Table 2-22).

17 Wetland and riparian areas in the Arkansas Valley region have been altered by historic  
18 development, mining, and grazing activities. According to the ECRMP AMS, although riparian  
19 and wetland vegetation community succession is generally advancing with intensified  
20 management in the region, much of the infrastructure (e.g. fences, water-developments, etc.) is  
21 deteriorating and unplanned livestock use is likely increasing (BLM 2015).

22 Along the Arkansas River, most infrastructure is located at a higher elevation than the elevation  
23 of the riparian plant community, including most recreation facility development (BLM and  
24 CPW 2017). Current trends indicate that a substantial portion of public use increase is dispersed  
25 away from developed sites (BLM and CPW 2017). Increased recreational use for activities like  
26 camping and water-based recreation has resulted in disturbances to riparian resources through  
27 trampled vegetation and modified stream banks, especially along the Arkansas River corridor.  
28 Increased recreation has also contributed to the spread of noxious weeds along the Arkansas  
29 River corridor (BLM and SPW 2017). Refer to 2.1.7, Terrestrial Vegetation for a discussion of  
30 noxious weeds within the BCNM and 5-miles of the Arkansas River corridor.

**1 Table 2-22 PFC Ratings for Stream Channel Reaches within the BCNM**

Stream Name	Total Length (miles)	Flow Regime	Origin	PFC Rating
Arkansas River	6.00	Perennial	Snowmelt, storm, groundwater, spring fed	Not assessed (most likely PFC)
Bald Mountain Gulch (upper)	0.25	Perennial	Spring-fed	PFC
Bald Mountain Gulch (lower)	0.36	Ephemeral	Spring-fed	NF
Little Cottonwood Creek (Forest Service)	0.58	Perennial: 0.39 mile Intermittent: 0.19 mile	Snowmelt	NF
Little Cottonwood Creek (BLM)	1.90	Perennial	Spring-fed, snow melt, rainfall	PFC
Unnamed Gulch ½ mile South of Little Cottonwood	2.08	Perennial: 0.30 mile Ephemeral: 1.78 miles	Spring-fed, snow melt, rainfall	FAR
Middle Cottonwood Creek	5.30	Perennial: 0.40 mile Ephemeral: 4.90 miles	Spring-fed, snow melt, rainfall	FAR
Cottonwood Creek (Upper in Bassam Park)	5.74	Perennial: 0.80 mile Ephemeral: 4.44 miles	Spring-fed, snow melt, rainfall	FAR
Cottonwood Creek (lower)	5.74	Perennial: 0.50 mile Ephemeral: 4.44 miles	Spring-fed, snow melt, rainfall	FAR
Spring Gulch	4.40	Perennial: 0.50 mile Intermittent: 3.90 miles	Spring-fed	PFC
Sawmill Gulch (very small riparian reach)	2.40	Perennial: 0.17 mile Ephemeral: 2.23 miles	Spring-fed, snow melt, rainfall	PFC
Stafford Gulch	4.00	Intermittent: 0.50 mile Ephemeral: 3.50 miles	Spring-fed, snow melt, rainfall	FAR

Source: USFS 2017

2 Warmer and drier climate conditions are likely to reduce the extent and degrade the conditions of  
 3 wetlands and riparian areas in the future. Wetlands at lower elevations may receive less inputs  
 4 and lower groundwater levels while warmer temperatures at higher elevations may consequent  
 5 earlier snowmelt and influence the species composition of wetland habitats (CNHP 2015).  
 6 Warmer and drier conditions and the associated changes in runoff quantity and timing are  
 7 expected to result in earlier peak flows and low late-summer flows, which are likely to impact

1 the structure and species composition of riparian vegetation, especially at lower elevations  
2 (CNHP 2015).

3 As described in the ECRMP AMS, some wetland areas that were historically wet have dried  
4 (e.g., fens, springs, and smaller-stream riparian areas) and livestock and wildlife use patterns  
5 have changed as a result (BLM 2015). The shift in use patterns by livestock and wildlife may  
6 result in concentrated visitation of wetland and riparian habitats as droughts increase in the  
7 future.

8 In summary, the drivers and stressors for wetland and riparian resources in the BCNM include  
9 the following:

- 10 • Increased recreational use in the BCNM will likely lead to increased physical  
11 disturbances along riparian corridors through loading and unloading boats, as well as  
12 dispersed camping within the river corridor. These activities may increase trampling and  
13 denuding of vegetation and wood cutting in riparian habitats, while also resulting in the  
14 transport of noxious plant species.
- 15 • Drought and warmer conditions are likely to continue into the future. Climate change  
16 could exacerbate the effects of drought and warmer temperatures on wetland and riparian  
17 resources by reducing the extent and degrading the conditions of these habitats.

#### 18 **2.1.9.5 Existing Management Direction**

19 Table 1-2 lists relevant, existing Federal, state, and local management direction relevant to  
20 wetlands and riparian areas in the BCNM. In addition, BLM Management Objectives and  
21 Direction, and USFS Management Direction and Standards and Guidelines that are specifically  
22 relevant to wetlands and riparian areas are presented below.

#### 23 **BLM Royal Gorge Resource Area RMP (Eco-Subregion 1, Arkansas River)**

##### 24 Objective Decisions

- 25 • Seventy five percent of all riparian areas will be at properly functioning condition by  
26 1997.

##### 27 Allocation Decisions

- 28 • Perennial riparian areas will be closed to locatable mineral entry except for recreational  
29 placering, closed to mineral materials disposal, will have all withdrawals for  
30 waterpower/reservoir sites recommended for revocation, and all OHV use limited to  
31 designated roads and trails.

##### 32 Action Decisions

- 33 • Riparian area inventories will be completed and mapped as soon as possible.
- 34 • Interdisciplinary support will be emphasized for riparian restoration.

- All IAPs will reflect riparian objectives.

**USFS PSICC LRMP**

The PSICC LRMP includes the following Management Direction:

Riparian Area Management

- 02 Design and implement activities in management areas to protect and manage the riparian ecosystem.
- 03 Manage riparian areas to reach the latest seral stage possible within the stated objectives.
- 04 Prescribe silvicultural and livestock grazing systems to achieve riparian area objectives
- 05 Locate and construct arterial and collector roads to maintain the basic natural condition and character of riparian areas.

The LRMP also includes Management Prescription (9A) that applies to all the component ecosystems of riparian areas, including the aquatic ecosystem, that riparian ecosystem (characterized by distinct vegetation), and the adjacent ecosystems that remain within approximately 100 feet of both edges of all perennial streams. The general direction and goals of this management prescription include the following:

- Provide healthy, self-perpetuating plant communities, meet water quality standards, and provide habitats for viable populations of wildlife and fish.
- Vegetation treatments are conducted to improve wildlife and fish habitat diversity and multi-resource benefits.
- Livestock grazing is at a level that will assure maintenance of the vigor and regenerative capacity of riparian plant communities.
- Vehicular travel is limited on roads and trails at times when the ecosystems would be unacceptably damaged.
- Developed recreation facility construction for overnight use is prohibited within the 100-year floodplain.

**2.1.9.6 Needs for Change and Management Opportunities**

Given the resource conditions, trends, and existing management in BCNM, Table 2-23 summarizes needs for change and management opportunities to consider in the BCNM MP.

**Table 2-23 Needs for Change and Management Opportunities for Wetlands and Riparian Resources**

Needs for Change	Management Opportunities
The potential for increasing recreational use in BCNM	Limit adverse effects from livestock grazing in seeps

resulting from population growth and following publicity around its designation may increase the potential for physical disturbance to wetland and riparian vegetation. This foreseeable trend would increase the risk of ecosystem degradation and destruction of BCNM ROVs. Further, climate change could exacerbate the effects of drought and warmer temperatures on wetland and riparian resources by reducing the extent and degrading the conditions of these habitats within the BCNM.	and springs, especially in Bassam Park. Limit the disturbance of riparian communities from increased recreational use in the Arkansas River corridor. Consider adjusting livestock grazing practices (e.g., timing, number, distribution) and limiting other uses, including recreation, which may conflict with wetland and riparian condition objectives.
--	---

1 **2.1.10 Aquatic Wildlife**

2 Browns Canyon is notable for its largely undisturbed and intact aquatic biotic community  
3 supporting support a diverse array of aquatic wildlife, including fish, amphibians, and  
4 macroinvertebrates. The cold waters of the Arkansas River also support a Gold Medal Status  
5 trout fishery. Recreation in the summer months is the primary human use along the main river  
6 corridor affecting aquatic wildlife by disturbing wildlife and eroding river banks. Active mining  
7 claims result in erosion, sedimentation, and wildlife disturbance. Concentrated livestock grazing  
8 in seeps and springs also alters aquatic habitat for macroinvertebrates and amphibians. Along  
9 with a warming and drying climate, these stressors to aquatic habitat are anticipated to continue  
10 or, in the case of recreation especially, increase into the future.

11 Planning issues and management concerns based on Proclamation 9232 and additional agency  
12 concerns include:

- 13 • Where is special management needed to restore, maintain or enhance priority species and  
14 their habitats?
- 15 • How should uses, including recreational use, grazing, motorized and mechanized vehicle  
16 use, etc., be managed to provide for wildlife habitat needs?
- 17 • What interpretive priorities could be established to enhance the public’s understanding of  
18 wildlife and habitat needs in the monument?
- 19 • Where and how will potential increased river and upland recreation use, resulting as a  
20 consequence of monument designation, affect species and their habitats?
- 21 • How will current and future change agents or drivers such as development in Chaffee  
22 County, climate change, invasive species, fire, and changes in recreational use and  
23 pressure affect monument biological ROVs in the period 2015-2035?
- 24 • What BLM or USFS land use or adaptive management decisions are necessary to protect  
25 BCNM hydrologic function, aquatic biological activity, including invertebrate prey base  
26 & monument habitat in intermittent streams, wetlands, terrestrial upland meadow plant  
27 community successional state, emergent springs, their ecological integrity, productivity,  
28 resulting from stressors such as long-term drought, water temperature change,  
29 concentrated livestock use?

- What decisions are necessary to conserve and protect the water resources and fisheries of the Arkansas River, area streams and ephemeral drainages based on seasonally available flows, and support aquatic, riparian and terrestrial species and communities?

#### **2.1.10.1 Assessment Area**

The geographic area considered for characterizing conditions and trends of aquatic species is the portions of the Arkansas River and associated tributaries that flow through the BCNM. This includes the 7.1 miles of the river within the BCNM boundary, and all tributaries that flow within the BCNM boundary.

#### **2.1.10.2 Best Available Scientific Information**

Best available scientific information for aquatic wildlife includes the following scientific literature and reports listed below. References that are laws, orders, handbooks, or LUPs are stated one time in Table 1-2 to reduce redundancy.

BLM. 2017. AIM National Aquatic Monitoring Framework: Field Protocol for Wadeable Lotic Systems. Tech Ref 1735-2. Available at: National Operations Center, Denver, CO. [https://www.blm.gov/sites/blm.gov/files/documents/files/TR\\_1735-02.pdf](https://www.blm.gov/sites/blm.gov/files/documents/files/TR_1735-02.pdf).

BLM. 2015. AIM National Aquatic Monitoring Framework: Introducing the Framework and Indicators for Lotic Systems. Technical Reference 1735-1. National Operations Center, Denver, CO. Available at: <https://www.blm.gov/sites/blm.gov/files/uploads/AIM%20National%20Aquatic%20Monitoring%20Framework.pdf>.

Hammerson, G.A. 1999. Amphibians and Reptiles in Colorado: A Colorado Field Guide. Second edition. Boulder, CO: University Press of Colorado.

Olson, Steve. 2017. U.S. Forest Service. Browns Canyon National Monument BioBlitz Species List (bcnmsp\_jAN2017.xls). January.

Policky, G.A. No Date. Upper Arkansas River – Fish Survey and Management Data. Colorado Parks and Wildlife. Available: <https://cpw.state.co.us/thingstodo/Fishery%20Survey%20Summaries/ArkansasRiverUpper.pdf>. Accessed October 30, 2017.

Scott, M.L., A.M.D. Brasher, A.M. Caires, E.W. Reynolds, and M.E. Miller. 2006. The structure and function of riparian and aquatic ecosystems of the Colorado Plateau: Conceptual models to inform monitoring. Report to the Southern and Northern Colorado Plateau Networks.

Smith, R.E. and Hill, L.M. (eds.). 2000. Arkansas River Water Needs Assessment. BLM/RS/ST-00/002+7200. Bureau of Land Management, Bureau of Reclamation, USDA Forest Service, and Colorado Department of Natural Resources.

1 **GIS Data**

- 2 • USFWS National Wetland Inventory, Wetlands CO\_Wetlands. Available:  
3 <https://www.fws.gov/wetlands/>. Accessed: September 14, 2017.
- 4 • USGS National Hydrology Dataset, NHDFLowline. Available:  
5 <https://nhd.usgs.gov/data.html>. Accessed: October 2, 2017.
- 6 • USGS National Hydrology Dataset, NHDWaterbody. Available:  
7 <https://nhd.usgs.gov/data.html>. Accessed: October 2, 2017.
- 8 • USGS Watershed Boundary Dataset, WBDHU12. Available:  
9 <https://nhd.usgs.gov/data.html>. Accessed: October 2, 2017.

10 **2.1.10.3 Limitations/Data Gaps**

11 Data for non-fish aquatic wildlife in BCNM is generally lacking, aside from observational data.  
12 Data for fish is based largely upon abundance (biomass). No sites in the BCNM area have been  
13 assessed using the National Aquatic Monitoring Framework (NAMF), which is a strategy used to  
14 monitor current conditions and future trends of aquatic ecosystems. The NAMF effort introduces  
15 the framework and indicators for Lotic Systems (BLM Technical Reference 1735-1),  
16 standardizing aquatic core indicators, field-sampling methodologies (BLM Technical Reference  
17 1735-2), electronic data capture, and the use of statistically valid sample designs. In the future,  
18 targeted sites will be used to intensively monitor all streams within BCNM to assess the current  
19 conditions and monitor trends.

20 **2.1.10.4 Existing Conditions and Trends**

21 The Arkansas River flows north to south through BCNM, providing habitat for a number of  
22 aquatic wildlife species. Aquatic habitat is also present in three tributaries of the Arkansas River  
23 that flow through the BCNM; Cottonwood Creek, Little Cottonwood Creek, and Middle  
24 Cottonwood Creek (Figure 2-8).

25 Fish

26 Fish communities play an essential role in the ecological integrity of aquatic systems (Scott et al,  
27 2005). The cold waters of the Arkansas River host an exceptional brown trout fishery and a  
28 developing rainbow trout fishery. The river provides excellent fishing opportunities and was  
29 designated a Gold Medal fishery by the Colorado Wildlife Commission in 2014 for the density  
30 and size of trout present in the river. Densities of brown trout (*Salmo trutta*) in much of the river  
31 have been observed as high as 2,000 fish per mile (Smith et al 2000). Both the Arkansas River  
32 and Cottonwood Creek provide important spawning habitat for the species. Within the BCNM,  
33 brown trout are a naturally sustained population and not stocked. Rainbow trout (*Oncorhynchus*  
34 *mykiss*) densities have been observed as high as 100 fish per mile and are supported by periodic  
35 stocking by CPW of fingerling-sized fish (Smith et al 2000). Rainbow trout populations crashed  
36 in the 1990's due to whirling disease, and are still recovering. Disease-resistant strains of

1 rainbow trout have been introduced into the population by CPW in an effort to restore healthy  
2 rainbow trout populations.

3 The river also provides habitat for a number of non-game fish species, including white suckers  
4 (*Catostomus commersonii*), fathead minnows (*Pimephales promelas*), and longnose dace  
5 (*Rhinichthys cataractae*). Creel surveys and fish sampling conducted annually by CPW provide a  
6 baseline understanding of fish distribution and abundance within the river ecosystem. Monitoring  
7 of trout populations can also be used as a management tool for determining the overall health of  
8 the aquatic ecosystems and associated non-game species of fish.

#### 9 Amphibians

10 The diversity of amphibian species within the BCNM assessment area is limited to one  
11 documented species. Tiger salamander (*Ambystoma tigrinum*) has been identified in Cottonwood  
12 Creek (USFS 2017). Northern leopard frog (*Lithobates pipiens*), a Forest Service species of  
13 concern, has not been documented within the BCNM, and limited suitable habitat for the species  
14 is present. Despite its mention in Proclamation 9232, boreal toad (*Anaxyrus boreas boreas*) is not  
15 documented and unlikely to occur in BCNM.

#### 16 Macroinvertebrates

17 Macroinvertebrates are an integral part of a healthy aquatic ecosystem, providing an important  
18 food source to numerous wildlife species including fish, birds, and bats (Smith et al 2005).  
19 Baseline aquatic insect sampling was conducted by USFS between October 2015 and June 2017,  
20 following the designation of BCNM. Over 60 aquatic insect species have been identified within  
21 the Arkansas River corridor (USDOI & CPW, 2017). Macroinvertebrate populations are an  
22 indicator of the overall health of aquatic ecosystems (Smith et al 2005).

23 In summary, the drivers and stressors for aquatic wildlife resources in the BCNM are listed  
24 below. The diversity of species identified within in the Arkansas River indicates a relatively  
25 healthy ecosystem, however threats to water quality and ecological integrity are present due to  
26 recreational and commercial uses of the river and surrounding corridor.

27 Historic mining activities within the BCNM have contributed to water quality issues due to the  
28 release of heavy metals onto surface waters such as the Arkansas River. Elevated metal  
29 concentrations can pose a direct threat to macroinvertebrate populations as well as indirect  
30 threats to fish and other aquatic and terrestrial wildlife through bioaccumulation. Gold-panning  
31 also occurs non-commercially within the river corridor and therefore effects are likely to be  
32 reduced in extent and intensity in comparison to historic commercial mining activity.

33 The Arkansas River is a Gold Medal Status fishery and one of the most commercially rafted  
34 rivers in the United States. The thousands of anglers and boaters it attracts can pose a number of  
35 threats to the aquatic ecosystem. The most significant threats are pollution from human waste  
36 and trash, transportation of aquatic and terrestrial invasive species, trampling of aquatic and  
37 riparian vegetation, and localized stream bank erosion.



1 Cattle grazing currently occurs within the BCNM boundary and the Arkansas River ecosystem.  
2 Improperly managed livestock can be a stressor to aquatic ecosystems, including the introduction  
3 of noxious weeds, trampling and overgrazing of riparian vegetation and wetland or seep/spring  
4 vegetation, and increased streambank erosion that contributes to water turbidity.

5 The main natural stressor to aquatic wildlife is sedimentation due to high precipitation events,  
6 which may be exacerbated by human activities. Increased stream bank erosion can result in  
7 turbid conditions and sedimentation of stream bottoms that affect the biotic community through  
8 the reduction of in-stream dissolved oxygen levels and fluctuations in the availability of fish  
9 spawning habitat.

#### 10 **2.1.10.5 Existing Management Direction**

11 Table 1-2 lists relevant, existing Federal, state, and local management direction relevant to  
12 aquatic wildlife in the BCNM. In addition, BLM Management Objectives and Direction, and  
13 USFS Management Prescriptions that are specifically relevant to aquatic wildlife are presented  
14 below. Also refer to Section 2.1.6 Water Resources and to 2.1.9 Wetlands and Riparian  
15 Resources for existing BLM and USFS management relevant to aquatic wildlife habitat.

#### 16 **BLM Royal Gorge Resource Area RMP (Eco-Subregion 1, Arkansas River)**

##### 17 Objective Decisions

- 18 • Conflicts between fishery habitat and other values e.g., livestock grazing, mineral  
19 development, etc., will be resolved in favor of fishery habitat.

##### 20 Allocation Decisions

- 21 • All streams will be protected through:
  - 22 ○ Standard lease terms for fluid minerals
  - 23 ○ Locatable mineral entry closures except for recreational placerring
  - 24 ○ Mineral materials disposal closures
  - 25 ○ OHV use limited to designated roads and trails

##### 26 Action Decisions

- 27 • None applicable

#### 28 **USFS Management Area 2B, 4B, 4d, 5b, 6b Prescriptions**

##### 29 Wildlife and Fish Resource Management

30 02 02 Maintain habitat capability for species of special conservation concern

1 **USFS Management Area 4B Prescriptions**

2 Wildlife and Fish Resource Management

- 3 03 Emphasis on species commonly hunted, fished, or trapped will follow species  
4 priorities established by States  
5 a. Maintain at least 90 percent of the habitat needed to support the State population  
6 goals for each species

7 **2.1.10.6 Needs for Change and Management Opportunities**

8 Given the resource conditions and trends and existing management in BCNM, Table 2-24  
9 summarizes needs for change and management opportunities to consider in the BCNM MP.

10 **Table 2-24 Needs for Change and Management Opportunities for Aquatic Wildlife**

Needs for Change	Management Opportunities
Preservation of aquatic habitats is needed in order to sustain healthy fish, macroinvertebrate, and microinvertebrate populations.	Develop joint BLM/USFS management direction and standards and guidelines for aquatic habitat, including seeps and springs supporting aquatic wildlife other than fish Long-term monitoring of aquatic habitats including seeps and springs is needed to inform adaptive management decisions

11 **2.1.11 Terrestrial and Avian Wildlife**

12 As described in Proclamation 9232, the unusual geology and range of elevations within BCNM  
13 supports a wide diversity of plant and wildlife species. A number of transitional habitats exist  
14 between the riparian areas of the Arkansas River corridor and the high-elevation spruce-fir  
15 forests within the BCNM, making this one of the most significant regions for biodiversity in  
16 Colorado. Forests within the BCNM provide habitat for big game species such as deer and elk,  
17 and the rocky cliffs within BCNM provide nesting habitat for emblematic species such as the  
18 peregrine falcon and golden eagle.

19 Historically, the rough terrain of lands within the BCNM have left most habitats relatively  
20 undisturbed, with the exception of the highly trafficked river corridor. Recreation in Chaffee  
21 County has dramatically increased in recent years and the increase is expected to continue.  
22 Recreation in the BCNM can impact wildlife through disturbance and degradation of habitats,  
23 and human wildlife conflicts have the potential to increase. Future management may be needed  
24 to address these potential impacts to wildlife.

25 ROVs for wildlife include the following:

- 26 • BCNM is home to some of Colorado's most emblematic animal species, including  
27 mountain lions, bighorn sheep, mule deer, bobcat, red and gray fox, American black bear,  
28 coyote, American pine marten, kangaroo rat, elk, and several species of tree and ground  
29 squirrels. The Browns Canyon area provides essential habitat for mammals and birds  
30 alike and attracts hunters and wildlife viewers.

- 1 • Raptors such as red-tailed hawks, Swainson's hawks, golden eagles, turkey vultures, and  
2 prairie falcons make their homes in the rocky cliffs and prey upon the abundance of small  
3 animals that live in this area.
- 4 • A stunning diversity of other bird species, including the cliff swallow, Canada jay,  
5 mourning dove, flicker, blue jay, wild turkey, great horned owl, western screech owl, and  
6 saw whet owl, attract ornithologists and bird enthusiasts alike.

7 Planning issues and management concerns based on Proclamation 9232 and additional agency  
8 concerns include:

- 9 • Where is special management needed to restore, maintain, or enhance priority species and  
10 their habitats?
- 11 • How should uses, including recreational use, grazing, motorized, and mechanized vehicle  
12 use, etc., be managed to provide for wildlife habitat needs?
- 13 • What interpretive priorities could be established to enhance the public's understanding of  
14 wildlife and habitat needs in the monument?
- 15 • Where and how will potential increased river and upland recreation use, resulting as a  
16 consequence of monument designation, affect species, and their habitats?
- 17 • How will current and future change agents or drivers such as development in Chaffee  
18 County, climate change, invasive species, fire, and changes in recreational use and  
19 pressure affect monument biological ROVs in the period 2015-2035?
- 20 • How do BLM and USFS adaptively manage for Increased BCNM backcountry  
21 recreation, increases habitat disturbance, people-wildlife encounters with big horn, raptor,  
22 or other wildlife during lambing, nesting, winter or other crucial period?

#### 23 **2.1.11.1 Assessment Area**

24 The geographic area considered for characterizing conditions and trends of terrestrial and avian  
25 wildlife is the BCNM boundary.

#### 26 **2.1.11.2 Best Available Scientific Information**

27 Andrews, R. and R. Righter. 1992. Colorado Birds. Denver, CO: Denver Museum of Natural  
28 History.

29 Armstrong, D.M., J.P. Fitzgerald, C.A. Meaney. 2011. Mammals of Colorado 2nd Edition.  
30 Denver Museum of Nature & Science and University Press of Colorado. Boulder, CO. 620  
31 pgs.

32 Baldwin, Roger A. and Louis C. Bender. 2008. Den-site Characteristics of Black Bears in Rocky  
33 Mountain National Park, Colorado. Journal of Wildlife Management 72(8):1717-1724.

- 1 Baldwin, Roger A. and Louis C. Bender. 2007. Distribution, Occupancy, and Habitat Correlates  
2 of American Martens in Rocky Mountain National Park, Colorado. *Journal of Mammalogy*  
3 89(2):419-427.
- 4 Baldwin, Roger A. and Louis C. Bender. 2010. Development of Equations Predictive of Size and  
5 Condition for Black Bears in Rocky Mountain National Park, Colorado. *The American*  
6 *Midland Naturalist* 164(1):44-51.
- 7 Barbknecht, A.E. W.S. Fairbanks, J.D. Rogerson, E.J. Maichak, B.M. Scurlock, and L.L.  
8 Meadows. 2011. Elk parturition site selection at local and landscape scales. *Journal of*  
9 *Wildlife Management* 75:646-654.
- 10 Bock, C.E. J.H. Bock, W.R. Kenney, and V.M. Hawthorne. 1984. Responses of Birds, Rodents,  
11 and Vegetation to Livestock Exclosure in a Semidesert Grassland State. *Journal of Range*  
12 *Management* 37(3):239-242.
- 13 Calisher, Charles H., James N. Mills, William P. Sweeney, J. Jeffrey Root, Serena A. Reeder,  
14 Emily S. Jentes, Kent Wagoner and Barry J. Beaty. 2005. Population Dynamics of a Diverse  
15 Rodent Assemblage in Mixed Grass-Shrub Habitat, Southeastern Colorado, 1995-2000.  
16 *Journal of Wildlife Diseases* 41(1):12-28.
- 17 Carpenter T.E., V.L. Coggins, C. McCarthy, C.S. O'Brien, J.M. O'Brien, T.J. Schommer. 2014.  
18 A spatial risk assessment of bighorn sheep extirpation by grazing domestic sheep on public  
19 lands. *Preventive Veterinary Medicine* 114 (2014) 3-10.
- 20 Cook, J.G., B.K. Johnson, R.C. Cook, R.A. Riggs, T. DelCurto, L.D. Bryant, and L.L. Irwin.  
21 2004. Effects of summer-autumn nutrition and parturition date on reproduction and survival of  
22 elk. *Wildlife Monographs* 155:1-61.
- 23 Corn, Paul S., Michael L. Jennings, and Erin L. Muths. 1997. Survey and Assessment of  
24 Amphibian Populations in Rocky Mountain National Park. *Northwestern Naturalist* 78(1):34-  
25 55.
- 26 CPW. 2017a. Big Game Herd Management (DAU) Plans. Available:  
27 <http://cpw.state.co.us/thingstodo/Pages/HerdManagementPlans.aspx>. Accessed January 5,  
28 2018.
- 29 CPW. 2017b. Big Game Draw and Hunting Statistics. Available:  
30 <http://cpw.state.co.us/thingstodo/Pages/Statistics.aspx>. Accessed January 3 2018.
- 31 Dreher, Brian and Jack Vayhinger. 2004. Mountain Lion Data Analysis Unit L-11 Management  
32 Plan. Colorado Parks and Wildlife.
- 33 Ellison, L. E., M. B. Wunder, C. A. Jones, C. Mosch, K. W. Navo, K. Peckham, J. E. Burghardt,  
34 J. Annear, R. West, J. Siemers, R. A. Adams, and E. Brekke. 2003. Colorado bat conservation  
35 plan. Colorado Committee of the Western Bat Working Group. Available at  
36 <http://www.wbwg.org/colorado/colorado.htm>

- 1 Falck, M.J., K.R. Wilson and D.C. Andersen. 2003. Small Mammals within Riparian Habitats of a  
2 Regulated and Unregulated Aridland river. *Western North American Naturalist* 63(1):35-42.
- 3 Finch, D. M. 1992. Threatened, endangered and vulnerable species of terrestrial vertebrates in the  
4 Rocky Mountain Region. U.S. Forest Service Tech. Rep. RM-215. 38pp.
- 5 Flake, Lester D. 1973. Food Habits of Four Species of Rodents on a Short-Grass Prairie in  
6 Colorado. *Journal of Mammalogy* 54(3):636-647.
- 7 Flake, Lester D. 1974. Reproduction of Four Rodent Species in a Short Grass Prairie of Colorado.  
8 *Journal of Mammalogy* 55(1):213-216.
- 9 Grigg, Jamin. 2015. Draft Black Bear Data Analysis Unit B-14 Management Plan. Colorado  
10 Parks and Wildlife.
- 11 Grigg, J. (CPW Terrestrial Biologist) 2017. Status of Elk, Mule Deer and Bighorn Sheep  
12 populations in and around the Browns Canyon National Monument. Personal Communication  
13 with Stephanie Shively, USFS Wildlife Biologist. Salida, CO July, 2017
- 14 Harrison, Paul D. and Melvin I. Dyer. 1984. Lead in Mule Deer Forage in Rocky Mountain  
15 National Park, Colorado. *Journal of Wildlife Management* 48:2.
- 16 Keith, J.O. (2003, August 25). Abert's Squirrel (*Sciurus aberti*): a technical conservation  
17 assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available:  
18 <http://www.fs.fed.us/r2/projects/scp/assessments/abertsquirrel.pdf>.
- 19 Keller, Barbara J. and Louise C. Bender. 2007. Bighorn sheep response to road-related  
20 disturbances in Rocky Mountain National Park, Colorado. *Journal of Wildlife Management*  
21 71(7):2329-2337.
- 22 Kingery, H.E., ed. 1998. Colorado breeding bird atlas. Colorado Springs, CO: Colorado Bird  
23 Atlas Partnership.
- 24 Klute, D. (ed.) 2008. Recommended buffer zones and seasonal restrictions for Colorado raptors.  
25 Division of Wildlife Denver, CO. 8 pg.
- 26 Lenth, B.E., R.L. Knight, and M.E. Brennan. 2008. The effects of dogs on wildlife communities.  
27 *Natural Areas Journal* 28:218-227.
- 28 Loeffler, C. (ed.), 2001. Conservation plan and agreement for the management and recovery of  
29 the southern Rocky Mountain population of the boreal toad (*Bufo boreas boreas*), Boreal Toad  
30 Recovery Team. 76 pp. + appendices.
- 31 Mello, Jerry M., Terese Richmond, and Gary W. Yohe. 2014. Climate Change Impacts in the  
32 United States: Third National Climate Assessment. U.S. Global Change Research Program,  
33 841 pp. doi:10.7930/J0Z31WJ2.
- 34 Miller, S.G., R.L. Knight, and C.K. Miller. 2001. Wildlife responses to pedestrians and dogs.  
35 *Wildlife Society Bulletin* 29:124-132.

- 1 Millspaugh, J.J. 1999. Behavioral and physiological responses of elk to human disturbances in the  
2 southern Black Hills, South Dakota. PhD Dissertation, University of Washington, Seattle,  
3 WA.
- 4 Naylor, M.N., M.J. Wisdom, and R.G. Anthony. 2009. Behavioral responses of North American  
5 elk to recreational activity. *Journal of Wildlife Management* 73:328-338.
- 6 Olson, S. 2015. Endangered, Threatened, Proposed and Regional Forester's Sensitive Species in  
7 the Rocky Mountain Region (R2): What's important for the Pike and San Isabel National  
8 Forests and the Cimarron and Comanche National Grasslands (PSICC). Unpubl. Rpt. USDA.  
9 PSICC. Pueblo, CO. 154 pp.
- 10 Packard, Fred Mallery. 1942. Wildlife and Aspen in Rocky Mountain National Park. *Ecology*  
11 23(4):478-482.
- 12 Packard, Fred Mallery. 1946. An Ecological Study of the Bighorn Sheep in Rocky Mountain  
13 National Park. *Journal of Mammalogy* 27(1):3-28.
- 14 Peinetti, H.R., S.C. Menezes, and M.B. Coughenor. 2001. Induced by Elk Browsing in the  
15 Aboveground Biomass Production and Distribution of Willow. *Oecologia* 127(3):334-342.
- 16 Phillips, G.E. and A.A. William. 2000. Reproductive success of elk following disturbance by  
17 humans during calving season. *Journal of Wildlife Management* 64:521-530.
- 18 Reynolds, Richard T.; Sánchez Meador, Andrew J.; Youtz, James A.; Nicolet, Tessa; Matonis,  
19 Megan S.; Jackson, Patrick L.; DeLorenzo, Donald G.; Graves, Andrew D. 2013. Restoring  
20 composition and structure in Southwestern frequent-fire forests: A science-based framework  
21 for improving ecosystem resiliency. Gen. Tech. Rep. RMRS-GTR-310. Fort Collins, CO: U.S.  
22 Department of Agriculture, Forest Service, Rocky Mountain Research Station. 76 p.
- 23 Radabaugh, D. and Sally Waterhouse. 2016. BioBlitz Progress Report– Brown's Canyon National  
24 Monument. U.S. Forest Service. Unpublished report. June 1-2.
- 25 Rogala, J. K., M. Hebblewhite, J. Whittington, C. A. White, J. Coleshill, and M.  
26 Musiani. 2011. Human activity differentially redistributes large mammals in the Canadian  
27 Rockies national parks. *Ecology and Society* 16(3): 16.
- 28 Rustand M. and R. Toretta, 2016. Survey of Mexican Spotted Owls in Colorado  
29 Annual Reports. BLM Royal Gorge Field Office and USFS San Carlos Ranger District. Canon  
30 City, CO. 21 pg.
- 31 Seglund, A.E. and P.M Schnurr. 2010. Colorado Gunnison's and white-tailed prairie dog  
32 conservation strategy. Colorado Division of Wildlife, Denver, Colorado, USA.
- 33 Shivley, Stephanie and Matt Rustand. Brown's Canyon National Monument Management  
34 Planning Specialist Assessment Report and Notes. 2017. USDA Forest Service and BLM.

- 1 Shively, K.J. A.A. William, and G.E. Phillis. 2005. Elk reproductive response to removal of  
2 calving season disturbance by humans. *Journal of Wildlife Management* 69:1073-1080.
- 3 Sime, C. A. 1999. Domestic Dogs in Wildlife Habitats. Pages 8.1-8.17 in G. Joslin and H.  
4 Youmans, coordinators. *Effects of recreation on Rocky Mountain wildlife: A Review for*  
5 *Montana. Committee on Effects of Recreation on Wildlife, Montana Chapter of The Wildlife*  
6 *Society.* 307pp.
- 7 Taylor, A.R. and R.L. Knight. 2003. Wildlife responses to recreation and visitor perceptions.  
8 *Ecological Applications* 13: 951-963.
- 9 USFS. 2017. Remote camera results from October 2015 to May 2016. Unpublished data.
- 10 Whitaker, D.G. and F. G. Lindzey. 2001. Population Characteristics of Sympatric Mule and  
11 White-Tailed Deer on Rocky Mountain Arsenal, Colorado. *The Journal of Wildlife*  
12 *Management.* 65(4):946-952.
- 13 White, C.A., C.E. Olmsted, and C.E. Kay. 1998. Aspen, Elk, and fire in the Rocky Mountain  
14 National Parks of North America. *Wildlife Society Bulletin* 26(3):449-462.
- 15 Wickersham, L.E., ed. 2016. The second Colorado breeding bird atlas. Colorado Bird Atlas  
16 Partnership. Denver, CO. 727 pg.
- 17 Wiedmann, B.P. and V.C. Bleich. 2014. Demographic Responses of bighorn sheep to recreational  
18 activities: a trial of a trail. *Wildlife Society Bulletin* 38(4):773–782; 2014.

19 **GIS Data**

- 20 • CPW Bighorn Sheep Summer Concentration Areas,  
21 Bighorn\_SummerConcentrationAreas. Available: CPW - ArcGIS Online. Accessed:  
22 January 8, 2018.
- 23 • CPW Bighorn Sheep Winter Concentration Areas, Bighorn\_WinterConcentrationAreas.  
24 Available: CPW - ArcGIS Online. Accessed January 8, 2018.
- 25 • CPW Elk Summer Concentration Areas, Elk\_SummerConcentrationAreas. Available:  
26 CPW - ArcGIS Online. Accessed: September 27, 2017.
- 27 • CPW Elk Winter Concentration Areas, Elk\_WinterConcentrationAreas. Available: CPW  
28 - ArcGIS Online. Accessed:September 27, 2017.
- 29 • CPW Mule Deer Summer Concentration Areas, MuleDeer\_ConcentrationAreas.  
30 Available: CPW - ArcGIS Online. Accessed:September 27, 2017.
- 31 • CPW Mule Deer Winter Concentration Areas, MuleDeer\_WinterConcentrationAreas.  
32 Available: CPW - ArcGIS Online. Accessed:September 27, 2017.

33 BASI that are laws, orders, handbooks, or LUPs are stated one time in Table 1-2 to reduce  
34 redundancy

1 **2.1.11.3 Limitations/Data Gaps**

2 Wildlife data specific to the BCNM is limited, consisting mostly of recent observations  
3 documented since BCNM’s designation. The BLM and USFS has limited inventory or  
4 monitoring data concerning wildlife or habitats within the BCNM. Most of the monument has  
5 had no previous data collection; the area has been viewed as a low priority by agency staff to  
6 inventory and monitor terrestrial species. Current data gaps are a result of a lack of both historic  
7 survey efforts along the Arkansas River corridor and understanding of population trends specific  
8 to the area. Steep and rugged terrain throughout much of BCNM area creates challenges for  
9 access and data collection. Survey data for nocturnal avian species, bats, and medium-size  
10 mammals in particular is very limited.

11 Upon designation of BCNM, efforts were made by USFS and BLM to collect data to provide a  
12 baseline of wildlife species within the monument boundary. Various wildlife surveys were  
13 conducted between October 2015 and June 2017, including winter track surveys, remote camera  
14 photographs,, breeding bird surveys, small mammal trapping, aquatic insect sampling, spider  
15 collection, bat mist netting, raptor nest monitoring, Mexican spotted owl (*Strix occidentalis*  
16 *lucida*) surveys, and northern goshawk (*Accipiter gentilis*) surveys. Several raptor nest sites are  
17 known to occur on BLM lands and have been monitored sporadically by the agency over time. In  
18 2016, naturalists from the public and natural resource specialists from the USFS and BLM  
19 conducted a “BioBlitz” of the BCNM, which is an intensive biological survey effort that  
20 attempts to record all species within a designated area.

21 **2.1.11.4 Existing Conditions and Trends**

22 BCNM is one of the least disturbed riparian ecosystems along the Arkansas River and has an  
23 intact biotic community. Prior to the establishment of Brown’s Canyon as a national monument,  
24 little data existed regarding wildlife species within BCNM boundaries. Existing information for  
25 species or habitat known or believed to occur within the BCNM limits the characterization of  
26 wildlife resource conditions and trends for the planning assessment.

27 **Species Diversity**

28 Approximately 134 wildlife species have been recorded in BCNM; 23 species of mammals  
29 (including 5 bat species), 97 species of birds, 3 species of reptiles, and 1 amphibian species  
30 (Shivley and Rustand, 2017). Aquatic insects and terrestrial insects have also been documented,  
31 including at least eight families of spiders (Radabaugh and Waterhouse 2016). A groundwater  
32 spring assessment was completed in 2017 on several springs within and near BCNM (Stevens  
33 and Holway 2017). Invertebrate species found at the sites were inventoried and identified. There  
34 are 20 USFS sensitive species, 12 BLM species of concern, and two species listed as Threatened  
35 under the ESA with the potential to occur in BCNM; these species are discussed in more detail in  
36 2.1.12, Special Status Species.



1 The USFS requires that land management planning provide for ecological conditions within the  
2 planning area to support a natural diversity of plant and animal communities while providing for  
3 ecosystem services and multiple uses (36 CFR Part 219). BLM land use planning identifies the  
4 need to achieve desired population and habitat conditions while maintaining a thriving natural  
5 ecological balance and multiple-use relationships (BLM H-1601-1, *Land Use Planning*  
6 *Handbook*). Both agencies concur that maintaining ecological integrity is integral to preserving  
7 wildlife habitats and species diversity.

## 8 **Game Species**

9 CPW maintains population trend data on game species such as black bear (*Ursus americanus*),  
10 mountain lion (*Puma concolor*), bighorn sheep (*Ovis canadensis*), mule deer (*Odocoileus*  
11 *hemionus*) and elk (*Cervus canadensis*). Trends for mule deer in the game management unit  
12 encompassing BCNM show a gradual decline in numbers since the 1990s (CPW, 2017a). The  
13 BCNM is within mule deer summer and winter range occur within the BCNM boundary (Figure  
14 2-11). The observed population levels for the Area D-16 mule deer herd that uses the BCNM has  
15 historically been below the CPW objective, including in recent years. The 2015 post hunt  
16 population estimate for the Area D-16 herd was approximately 12,000 animals, with a long-term  
17 population objective of 16,000 to 20,000 animals (CPW, 2017a).

18 The BCNM contains winter concentration and production areas for elk herd E-22 (Figure 2-11).  
19 Generally the E-22 elk herd has been above population objectives. For the past ten years, the  
20 population has ranged from 3,615 to 3,915 elk, which is above the target population of 3,500.  
21 Harvests range from 200 to 400 animals per year (CPW, 2017a).

22 Bighorn sheep within the BCNM are part of the S-47 herd. The overall population estimate for  
23 that herd is 80 individual sheep and CPW estimates that approximately 40 of them consistently  
24 use suitable habitat in BCNM (Grigg, 2017).

25 Black bears in BCNM are managed within black bear data analysis unit B-14. Black bears occur  
26 at low densities throughout much of the B-14 area due to limited foraging habitat, including the  
27 area within BCNM; summer concentration areas for the species occur to the east of the BCNM  
28 boundary (Grigg, 2015). Black bear populations within the BCNM and surrounding areas are  
29 considered stable (Grigg, 2015).

30 Mountain lions are currently managed by CPW to maintain a healthy, self-sustaining population  
31 that is in balance with suitable habitat while minimizing game and livestock damage complaints  
32 (Dreher, 2004). The latest population estimate was 431-452 individuals in the L-11 management  
33 area, which includes 5,439 square miles of central Colorado (Dreher, 2004). In 2017, CPW  
34 initiated a 10-year study of mountain lions and mule deer in central Colorado in an effort to  
35 better understand the mountain lion population and interactions between the two species (Grigg,  
36 2017).

1 **Non-game Species**

2 Existing conditions and trends for non-game species are evaluated by habitat type, in accordance  
3 with management agency objectives to maintain species diversity within plant and animal  
4 communities. Ecological conditions in these habitats are generally within the range of natural  
5 variability (Shivley, 2017). Habitat fragmentation is limited to a series of unpaved roads in the  
6 northwestern corner of BCNM and road FS-184, which runs north to south through BCNM.  
7 Invasive plant species occur along the railroad, roads, and trails, and may be affecting natural  
8 plant and animal communities. Connectivity to nearby forests is limited by residential and  
9 agricultural development along the river corridor on the west and southwest sides of BCNM;  
10 however, habitats are generally contiguous and undeveloped along other portions of the  
11 monument boundary, allowing wildlife movement between the BCNM and adjacent public  
12 lands.

13 Riparian Habitats

14 Riparian habitats comprise 3.5 percent (764 acres) of lands within BCNM, and are associated  
15 primarily with the Arkansas River and major tributaries, such as Cottonwood Creek. Riparian  
16 habitats encompass a number of vegetation and habitat types, and therefore generally support a  
17 high diversity of species. The river corridor provides habitat for species such as American dipper  
18 (*Cinclus mexicanus*), great blue heron (*Ardea herodias*), and mink (*Neovison vison*). Riparian  
19 shrubs provide habitat to nesting birds such as flycatchers, yellow warbler (*Setophaga petechial*)  
20 and Lewis' woodpecker (*Melanerpes lewis*). Mature cottonwood trees provide important perch  
21 sites for foraging bald eagles (*Haliaeetus leucocephalus*) and belted kingfishers (*Megaceryle*  
22 *alcyon*). Cliffs and banks adjacent to the river provide nesting sites for a number of species of  
23 swallows and white-throated swifts (*Aeronates saxatalis*). The river also sustains a number of  
24 macroinvertebrates that attract foraging birds and bats. Riparian habitat is the most frequently  
25 disturbed habitat type within BCNM. Recreational use and livestock grazing has resulted in  
26 changes to the natural ecological conditions including the introduction of invasive plant species,  
27 erosion of streambanks, and overgrazing of riparian vegetation that have degraded certain  
28 riparian wildlife habitat.

29 Grass and Forb Habitats

30 Habitat dominated by grasses and forbs comprise 6 percent (1,233 acres) of the BCNM. This  
31 habitat occurs on terraces above the Arkansas River and in the northeast corner of BCNM, and is  
32 characterized by open areas of grasses, forbs, and low shrubs. Wildlife species diversity in these  
33 habitats is typically lower than in riparian habitats, but still provides important nesting habitat for  
34 grassland and scrub species such as vesper sparrow (*Pooecetes gamineus*) and western  
35 meadowlark (*Sturnella magna*). Grass and forb habitats can also support mammals such as  
36 Gunnison's prairie dog (*Cynomys gunnisoni*) and other rodent species, providing an open  
37 hunting ground for raptors and other predatory species. Disturbance to these habitats has

1 occurred from livestock grazing and the introduction of invasive species from livestock and  
2 recreational use, which is expected to continue.

### 3 Piñon-Juniper Habitats

4 Piñon-juniper woodland is the most widespread habitat within the BCNM, covering nearly half  
5 (10,145 acres) of BCNM's area. This habitat type mostly occurs at elevations below 7,500 feet,  
6 serving as a transition zone between the riparian zone and high elevation forests. This habitat  
7 type is dominated by low trees, with grasses and shrubs such as mountain mahogany also  
8 present. A number of bird species nest and forage within piñon-juniper habitats, including  
9 loggerhead shrike (*Lanius ludovicianus*), piñon jay (*Gymnorhinus cyanocephalus*), Woodhouse's  
10 scrub jay (*Aphelocoa woodhouseii*), and green-tailed towhee (*Pipilo chlororus*). Forested  
11 canyons in BCNM area provide habitat for avian species such as canyon wren (*Catherpes*  
12 *mexicanus*) and roosting sites for big brown bats (*Eptesicus fuscus*) and *Myotis* species. Piñon-  
13 juniper habitats have had limited disturbance and are generally within the natural range of  
14 variability.

### 15 Mixed Conifer Habitats

16 Mixed conifers are the second-most dominant habitat type in the BCNM, comprising 40 percent  
17 (more than 4,000 acres) of BCNM's area. Coniferous habitats at elevations below 9,000 feet are  
18 dominated by ponderosa pine, mixed with lodgepole pine and juniper. These habitats provide  
19 nesting habitat for avian species such as northern goshawk, flammulated owl (*Psilosops*  
20 *flammeolus*), common nighthawk (*Chordeiles minor*), mountain bluebird (*Sialia currocoides*),  
21 and multiple species of woodpeckers. Mature ponderosa pine habitats provide habitat for Abert's  
22 squirrels (*Sciurus aberti*) and tree-roosting bats. Spruce-fir forests primarily occur above 9,000  
23 feet, with old-growth limber pine occurring in some areas of BCNM. These cool and moist  
24 forests provide habitat for avian species such as Clark's nutcracker (*Nucifraga columbiana*),  
25 Stellar's jay (*Cyanocitta stelleri*), olive-sided flycatcher (*Contopus cooperi*), and Cooper's hawk  
26 (*Accipiter cooperii*). Some areas of high elevation forests within BCNM contain pockets of  
27 suitable habitat for Mexican spotted owl, though the species has not been documented in the  
28 area. Coniferous habitat is currently the least disturbed and most intact ecosystem within BCNM,  
29 as road access to these habitats is limited.

### 30 **Management Indicator Species**

31 Management Indicator Species (MIS) were identified by the USFS in the 1984 LRMP for the  
32 PSICC. The Code of Federal Regulations (36 CFR 219.19 (a) (6)) states, "*population trends of*  
33 *management indicator species will be monitored and relationships to habitat changes*  
34 *determined.*" Two MIS have been identified in the BCNM area; Abert's squirrel and elk  
35 (Shively, 2017). Elk are widespread and discussed above. Abert's squirrel occurs in mature  
36 ponderosa pine forests, and was recorded at multiple locations during the 2016 bioblitz.

1 In summary, the drivers and stressors for terrestrial and avian wildlife resources in the BCNM  
2 are listed below. To date, most of the BCNM outside of the Arkansas River corridor has received  
3 limited recreational and development pressure. Public use of BCNM lands has primarily  
4 occurred along the river corridor. Forest roads provide limited access to upland areas. Invasive  
5 plant species occurring along the railroad, roads, and trails may affect natural plant and animal  
6 communities.

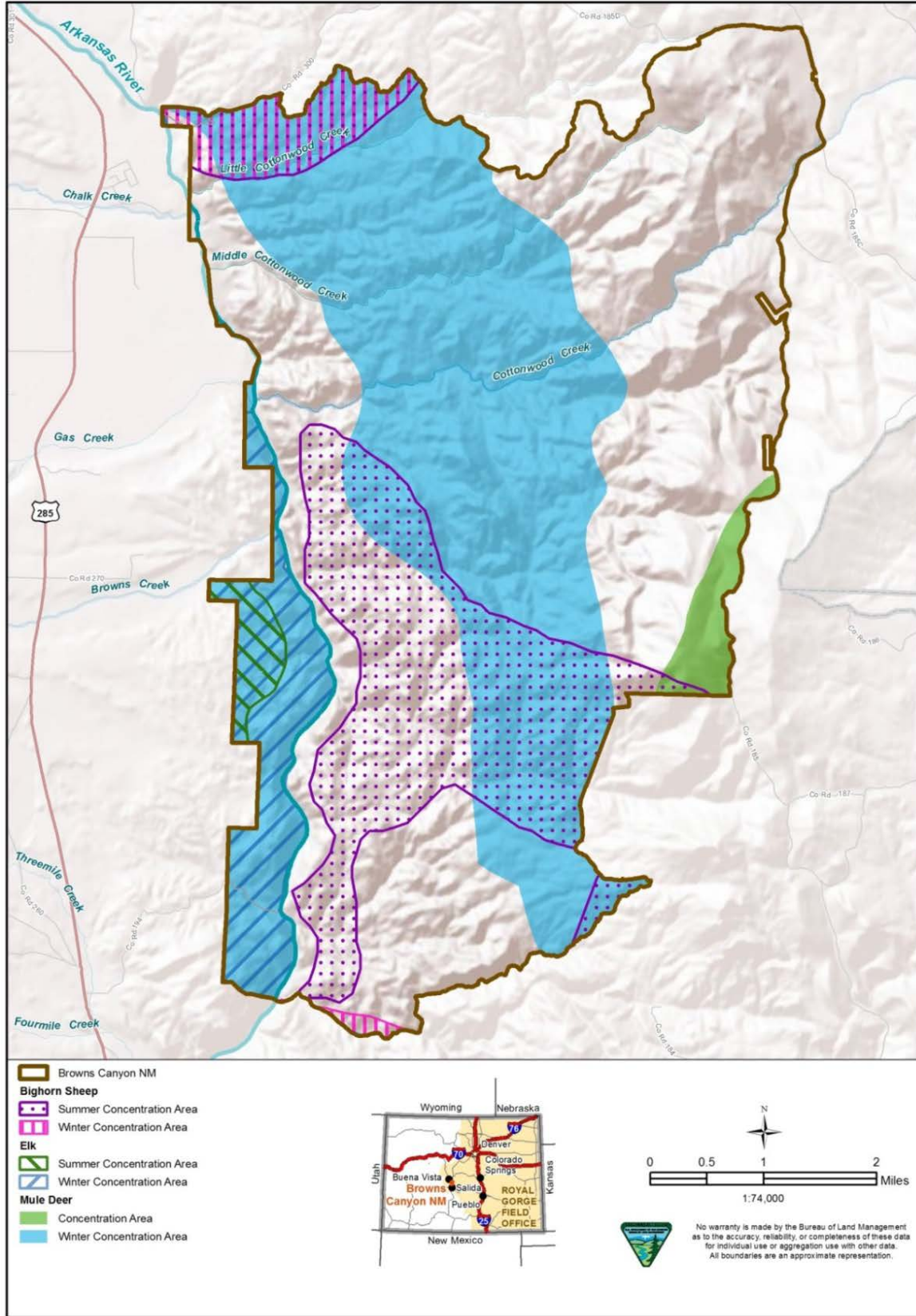
7 Grazing by livestock will likely continue at current levels and remain a driver for the reduction  
8 of some riparian vegetation. Upland grasses will benefit from livestock grazing by reducing the  
9 amount of decadent material and stimulating new growth available to wildlife species and  
10 insects. Invasive plant species within riparian and grass habitats will likely continue to be  
11 introduced and spread by livestock, as well as by humans, wildlife, and natural forces, and will  
12 likely outcompete native vegetation in some instances.

13 Recreation within the BCNM has primarily occurred along the river corridor, with high use by  
14 commercial and private water recreationists creating an impact zone that is diluted as distance  
15 from the river increases. OHV use occurs along forest roads, primarily during the fall hunting  
16 seasons. Forest roads are also accessible by snowmobile during the winter months. With  
17 monument designation, recreation outside the river corridor may increase along existing roads  
18 and trails. Potential stressors to wildlife that may occur from recreation include displacement,  
19 habitat degradation, and human-caused fires. Habituation to humans also has the potential to  
20 increase human conflicts with wildlife.

21 The primary natural stressor to the ecological integrity of wildlife habitats within the BCNM is  
22 fire. Climate change, leading to increased drought conditions, has the potential to increase the  
23 frequency and severity of wildfires. Drought conditions and warmer temperatures can also  
24 increase the severity of insect infestations, which causes large-scale die-offs of trees that result in  
25 an alteration of forest structure and increase the potential for severe fires to occur (Mello et al  
26 2014). As described in Section 2.1.7, Terrestrial Vegetation, USFS has recently detected  
27 moderate to severe spruce (*Dendroctonus rufipennis*) and mountain pine beetle (*Dendroctonus*  
28 *ponderosae*) activity near the boundaries of the BCNM.

29 Ecosystem alterations expected to occur as a result of a changing climate will have a numerous  
30 impacts on wildlife species. Milder winters and earlier spring thaws are already altering the  
31 timing of life cycle events such as leaf-out, blooming, hibernation, and migration, which can  
32 impact food resource availability for a wide range of wildlife species. Movements to higher  
33 elevations and the northward expansion of ranges have already been documented for a number of  
34 wildlife species, and are expected to continue as temperatures continue to increase (Mello et al  
35 2014). See the *Climate* section for additional information on anticipated effects from changes in  
36 climate in the BCNM.

37



1  
2 **Figure 2-11 Big Game Concentration Areas within the National Monument Boundary**

1 **2.1.11.5 Existing Management Direction**

2 Table 1-2 lists relevant, existing Federal, state, and local management direction for terrestrial and  
3 avian wildlife in the BCNM. In addition, BLM Management Objectives and Direction, and  
4 USFS Management Prescriptions that are specific to terrestrial and avian wildlife are presented  
5 below.

6 **BLM Royal Gorge Resource Area RMP (Eco-Subregion 1, Arkansas River)**

7 Objective Decisions

- 8 • Conflicts between wildlife habitat and other uses e.g., grazing, mineral development, etc.,  
9 will be resolved in favor of achieving vegetation management goals.

10 Allocation Decisions

- 11 • None applicable.

12 Action Decisions

- 13 • Big game birthing habitat will be closed to locatable mineral entry, closed to mineral  
14 materials disposal, and have OHV use limited to designated roads and trails.
- 15 • Big game birthing and critical winter habitat will be avoided by major ROWs.
- 16 • Big game critical winter habitat with identified conflicts with grazing will be addressed  
17 through cooperative efforts i.e., Colorado Habitat Partnership Program.
- 18 • Raptor nesting/fledging habitat will be available for fluid minerals leasing with a no  
19 surface occupancy stipulation.
- 20 • Fluid minerals leasing will be available with timing limitations for:
- 21 ○ big game critical winter habitat
- 22 ○ big game birthing habitat (elk calving, deer and pronghorn antelope fawning, and  
23 bighorn sheep lambing)
- 24 ○ wild turkey winter habitat

25 **USFS Management Area 2B**

26 Wildlife and Fish Resource Management

- 27 01 Maintain habitat capability for management indicator species.
- 28 a. Maintain capability at 60 percent of potential capability.

29 **USFS Management Area 4B Prescriptions**

30 Wildlife and Fish Resource Management

- 31 01 Maintain habitat capability for management indicator species.

- 1        02        Emphasis on species commonly hunted, fished, or trapped will follow species  
2                    priorities established by States.  
3                    a. Maintain at least 90 percent of the habitat needed to support the State population  
4                    goals for each species.

5        Wildlife Habitat Improvement and Maintenance

- 6        01        Maintain hiding cover for elk and deer, where present.  
7                    a. Maintain, along 75 percent of all arterial and collector road edges cover that hides  
8                    90 percent of an adult standing deer or elk from human view at a distance at 200 feet  
9                    from the road.  
10                    b. In diversity units dominated by forested ecosystems, maintain a minimum of 50  
11                    percent of the diversity unit in deer or elk hiding cover. This hiding cover should be  
12                    well distributed over the unit. Maintain 30 percent of the diversity unit in thermal  
13                    cover (winter or spring-summer). Hiding cover can be used to meet thermal cover  
14                    requirements if they indeed coincide biologically.  
15                    c. In forested areas of a unit, 15 percent or more should be in old growth habitat.  
16        02        Maintain wildlife habitat effectiveness. Permanent openings may be employed.  
17                    Reduce disturbance to wildlife so that no significant long-term negative effects result.  
18                    a. Maintain at least 80 percent habitat effectiveness.

19        **USFS Management Area 4D Prescriptions**

20        Wildlife and Fish Resource Management

- 21        01        Maintain habitat capability for management indicator species.  
22                    a. Maintain big game hiding cover next to aspen viewing areas, and along the edge of  
23                    arterial and collector roads.  
24                    b. Maintain habitat capability at a level at least 70 percent of potential capability for  
25                    aspen dependent big game species.  
26        02        Maintain habitat effectiveness for elk.  
27                    a. Maintain at least 80 percent habitat effectiveness.  
28        03        Maintain standing dead trees.  
29                    a. Provide snags needed to maintain habitat capability for cavity dependent wildlife at  
30                    80 percent or more of potential.  
31        04        Maintain aspen dominance on determinate and indeterminate sites.

32        **USFS Management Area 5B Prescriptions**

33        Wildlife and Fish Resource Management

- 34        01        Maintain habitat capability for management indicator species.

1 a. Maintain capability at 80 percent of potential capability.

2 Wildlife Habitat Improvement and Maintenance

3 01 Provide big game forage and cover, and habitat.

4 a. Maintain at least 30 percent of the area in created or natural openings.

5 b. Do not eliminate presence of any brose species.

6 c. Provide thermal cover for elk or deer on at least 20 percent of the area.

7 d. Maintain, along 75 percent of all arterial and collector road edges cover that hides  
8 90 percent of an adult standing deer or elk from human view at a distance at 200 feet  
9 from the road.

10 e. In diversity units dominated by forested ecosystems, maintain a minimum of 50  
11 percent of the diversity unit in deer or elk hiding cover. This hiding cover should be  
12 well distributed over the unit. Maintain 30 percent of the diversity unit in thermal  
13 cover (winter or spring-summer). Hiding cover can be used to meet thermal cover  
14 requirements if they indeed coincide biologically.

15 f. Maintain habitat effectiveness during winter of at least 90 percent.

16 g. Maintain habitat capability at a level at least 80 percent of potential capability.

17 **USFS Management Area 6B Prescriptions**

18 Wildlife and Fish Resource Management

19 01 Maintain habitat capability for management indicator species.

20 a. Maintain capability at 60 percent of potential capability.

21 02 Provide adequate forage to sustain big-game population levels agreed to in the  
22 Statewide Comprehensive Wildlife Management Plan on NFS lands.

23 a. Allocate no more than 80 percent of available forage to livestock.

24 **2.1.11.6 Needs for Change and Management Opportunities**

25 Given the resource conditions and trends and existing management in BCNM, Table 2-25  
26 summarizes needs for change and management opportunities to consider in the BCNM MP.



1 **Table 2-25 Needs for Change and Management Opportunities for Terrestrial and Avian**  
 2 **Wildlife**

Needs for Change	Management Opportunities
Potential stressors to wildlife from increased recreation	Limited use and seasonal closures of areas to travel may be warranted to protect elk and mule deer winter range, production areas (where identified), and winter concentration areas, and important bird nesting areas. Increased public awareness of wildlife issues may be needed to limit human wildlife conflicts and maintain the ecological integrity of wildlife habitats within BCNM. Adaptive management of ecosystems within BCNM should be considered and include long-term monitoring of management indicator species and species of concern. Citizen science should be considered a potential benefit that can be gleaned from increased visitation to monitor wildlife populations. A review of grazing practices within the BCNM under the BLM Colorado Public Health Land Standards should be conducted to assess the impacts of current grazing practices combined with potential increases in recreational use within BCNM.

3 **2.1.12 Special Status Species**

4 The evaluation of conditions and trends of special status species includes all species currently  
 5 listed as endangered, proposed, or candidate species under the Endangered Species Act (2017),  
 6 U.S. Forest Service Sensitive Species (2012), and those listed on the BLM Sensitive Species List  
 7 for Colorado (2009). These species are listed in Table 2-26. This section, in accordance with the  
 8 USFS 2012 Planning Rule, also identifies at-risk species, including:

- 9 • Federally recognized threatened, endangered, proposed, and candidate species (FSH  
 10 1909.12\_10 sec. 12.51).
- 11 • Potential species of conservation concern (FSH 1909.12\_10 sec. 12.52).

12 A USFS species of conservation concern (SCC) is defined as a species, other than federally  
 13 recognized as endangered, proposed, or candidate species, that is known to occur in the plan area  
 14 and for which the regional forester has determined that the BASI indicates substantial concern  
 15 about the species’ capability to persist over the long-term in the plan area. Appendix B, Species  
 16 Considered for U.S. Forest Service Species of Conservation Concern Status includes an initial  
 17 evaluation of SCC species for the BCNM. Based on an evaluation of existing BASI, species that  
 18 should be further considered for SCC determination are also included in Table 2-26. For a full  
 19 list of species evaluated for SCC status potential, refer to Appendix B, Species Considered for  
 20 U.S. Forest Service Species of Conservation Concern Status. This assessment follows direction  
 21 outlined in FSH 1909.12 Land Management Planning Handbook, Chapter 10 – The Assessment  
 22 and Section 12.5 – Identifying and Assessing At-risk Species to identify at-risk species and  
 23 species potentially meeting SCC status. The potential SCC species list will continue to be  
 24 considered and refined through the BCNM MP planning process.

25 ROVs for special status species include the following:

- 1 • Habitat suitable for peregrine falcons, which have been identified for possible future
- 2 reintroduction in BCNM, as well as potential habitat for the threatened Canada lynx.
- 3 • A significant herd of Rocky Mountain bighorn sheep.
- 4 • A number of reptile and amphibian species occur in the area, including the sensitive
- 5 northern leopard frog.

6 Planning issues and management concerns based on Proclamation 9232 and additional agency  
7 concerns include:

- 8 • Where is special management needed to restore, maintain or enhance priority species
- 9 (including special status species) and their habitats?
- 10 • How should uses, including recreational use, grazing, motorized and mechanized vehicle
- 11 use, etc., be managed to provide for wildlife (including special status species) habitat
- 12 needs?
- 13 • What interpretive priorities could be established to enhance the public’s understanding of
- 14 wildlife (including special status species) and habitat needs in the monument?
- 15 • Where and how will potential increased river and upland recreation use, resulting as a
- 16 consequence of monument designation, affect species (including special status species)
- 17 and their habitats?
- 18 • How will current and future change agents or drivers such as development in Chaffee
- 19 County, climate change, invasive species, fire, and changes in recreational use and
- 20 pressure affect monument biological ROVs in the period 2015-2035?

21 **2.1.12.1 Assessment Area**

22 The geographic area considered for characterizing conditions and trends of special status species  
23 is the BCNM boundary.

24 **2.1.12.2 Best Available Scientific Information**

25 Best available scientific information for special status species includes the scientific literature  
26 and reports listed below. BASI that are laws, orders, handbooks, or LUPs are stated one time in  
27 Table 1-2 to reduce redundancy.

28 Corn, Paul S., Michael L. Jennings, and Erin L. Muths. 1997. Survey and Assessment of  
29 Amphibian Populations in Rocky Mountain National Park. *Northwestern Naturalist* 78(1):34-  
30 55.

31 eBird. 2018. eBird: An online database of bird distribution and abundance [web application].  
32 eBird, Ithaca, New York. Available: <http://www.ebird.org>. Accessed January 5, 2018.

- 1 Ellison, L. E., M. B. Wunder, C. A. Jones, C. Mosch, K. W. Navo, K. Peckham, J. E. Burghardt,  
2 J. Annear, R. West, J. Siemers, R. A. Adams, and E. Brekke. 2003. Colorado bat conservation  
3 plan. Colorado Committee of the Western Bat Working Group. Available at  
4 <http://www.wbwg.org/colorado/colorado.htm>. Accessed January 5, 2018.
- 5 Finch, D. M. 1992. Threatened, endangered and vulnerable species of terrestrial vertebrates in the  
6 Rocky Mountain Region. U. S. For. Serv. Tech. Rep. RM-215. 38pp. FSM 2672. 2016. R2  
7 Supplement No.: 2600-2016. Forest Service Manual 2600 –  
8 Wildlife, Fish, and Sensitive Plant Habitat Management, Chapter 2670 - Threatened, Endangered,  
9 and Sensitive Plants and Animals, Rocky Mountain Region (Region 2), Denver, CO. 23 p.
- 10 Interagency Lynx Biology Team. 2013. Canada lynx conservation assessment and strategy. 3rd  
11 edition. USDA Forest Service, USDI Fish and Wildlife Service, USDI Bureau of Land  
12 Management, and USDI National Park Service. Forest Service Publication R1-13-19,  
13 Missoula, MT. 128 pp.
- 14 Keinath, D. and M. McGee. (2005, May 25). Boreal Toad (*Bufo boreas boreas*): a technical  
15 conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region.  
16 Available: <http://www.fs.fed.us/r2/projects/scp/assessments/borealtoad.pdf>.
- 17 Keller, Barbara J. and Louise C. Bender. 2007. Bighorn sheep response to road-related  
18 disturbances in Rocky Mountain National Park, Colorado. *Journal of Wildlife Management*  
19 71(7):2329-2337.
- 20 Kotliar, N.B. (2007, February 20). Olive-sided Flycatcher (*Contopus cooperi*): a technical  
21 conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region.  
22 Available: <http://www.fs.fed.us/r2/projects/scp/assessments/olivesidedflycatcher.pdf>
- 23 Loeffler, C. (ed.), 2001. Conservation plan and agreement for the management and recovery of  
24 the southern Rocky Mountain population of the boreal toad (*Bufo boreas*), Boreal Toad  
25 Recovery Team. 76 pp. + appendices.
- 26 Martin A.P and L. Sackett. 2012 Colorado Division of Wildlife Report. Assessing the Subspecies  
27 Status within *Cynomys gunnisoni*. Department of Ecology and Evolutionary Biology.  
28 University of Colorado. Boulder CO.
- 29 Neid, Stephanie. 2007. Rare Plant Survey of Select BLM lands in the Arkansas River Canyon,  
30 Chaffee and Fremont Counties, Colorado. Colorado Natural Heritage Program, Colorado State  
31 University, Fort Collins, CO.
- 32 Olson, S. 2015. Endangered, Threatened, Proposed and Regional Forester’s Sensitive Species in  
33 the Rocky Mountain Region (R2): What’s important for the PSICC . Unpubl. Rpt. USDA.  
34 PSICC. Pueblo, CO. 154 pp.
- 35 Olson, S. 2017. Brown’s Canyon National Monument BioBlitz Species List  
36 (bcnmssp\_jAN2017.xls). U.S. Forest Service. January.

- 1 Reynolds, R.T.; R.T. Graham; M.H. Reiser; and others. 1992. Management recommendations for  
2 the northern goshawk in the southwestern United States. Gen. Tech. Rep. RM-217. Ft. Collins,  
3 CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range  
4 Experiment Station. 90 pp.
- 5 Rominger, Eric M. and Alan R. Dale. 1988. Shrubs in the summer diet of Rocky Mountain  
6 bighorn sheep. *The Journal of Wildlife Management*. 52(1):47-50.
- 7 Ryke, N., S. Olson, T. Wagner, and M. Elson. 2003, version 11/01/03. Threatened, Endangered  
8 and Sensitive Species of the PSICC. USDA Forest Service (report).
- 9 Smith, B.E. and D.A. Keinath. (2007, January 16). Northern Leopard Frog (*Lithobates pipiens*): a  
10 technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region.  
11 Available: <http://www.fs.fed.us/r2/projects/scp/assessments/northernleopardfrog.pdf> [date of  
12 access].
- 13 Stevens, L.E. and J.H. Holoway, 2017. The Conservation Status of *Ochrotrichia susanae* in San  
14 Isabel National Forest, Colorado. Museum of Northern Arizona Springs Stewardship Institute.  
15 Flagstaff, AZ. 90 pgs.
- 16 U.S. Fish and Wildlife Service (USFWS). 2017. Environmental Conservation Online System  
17 Species by County Report. Available at: [https://ecos.fws.gov/ecp0/reports/species-by-](https://ecos.fws.gov/ecp0/reports/species-by-current-range-county?fips=08015)  
18 [current-range-county?fips=08015](https://ecos.fws.gov/ecp0/reports/species-by-current-range-county?fips=08015).
- 19 \_\_\_\_\_. 2012. Final Recovery Plan for the Mexican Spotted Owl (*Strix occidentalis lucida*), First  
20 Revision. USFWS. Albuquerque, New Mexico, USA. 413 pp.
- 21 USDA Forest Service. 2014. Mexican Spotted Owl (*Strix occidentalis lucida*) Recovery Habitat  
22 Mapping for the Pike & San Isabel National Forests. C. Beal, Pikes Peak Ranger District,  
23 Colorado Springs, CO. 16 pp.
- 24 \_\_\_\_\_. 2013. Region 2 Regional Foresters sensitive species list. Region 2 supplement 2600-2005-  
25 1. 2017. \_\_\_\_\_. 2001. Canada lynx population and habitat data for the Pike and San Isabel  
26 National Forests. Unpubl. rpt. Pueblo, CO.
- 27 Wiedmann, B. P. and Bleich, V. C. 2014, Demographic responses of bighorn sheep to recreational  
28 activities: A trial of a trail. *Wildl. Soc. Bull.*, 38: 773–782. doi:10.1002/wsb.463
- 29 Welker, M. 2013. Pike & San Isabel National Forests Lynx Habitat Re-Mapping of Primary and  
30 Secondary Habitat, Analysis Units, and Linkage Areas. Unpubl. Rpt. U.S. Department of  
31 Agriculture, Forest Service. PSICC. Pueblo, Colorado. 15 pp.
- 32 Wrigley, M., M. Comer, S. Olson, J. Windorski, M. White, R. Torretta, K. Meyer, F. Quesada, B.  
33 Elliot, P. Gaines, M. Painter & M. Welker, 2012. Threatened, Endangered, and Forest Service  
34 Sensitive Species on the Pike and San Isabel National Forests. (Updated June 2012).  
35 Unpublished report. Pike and San Isabel National Forest, Salida, CO. 138 pg.

1 **GIS Data**

- 2 • CPW Bighorn Sheep Summer Concentration Areas,  
3 Bighorn\_SummerConcentrationAreas. Available: CPW - ArcGIS Online. Accessed:  
4 January 8, 2018.
- 5 • CPW Bighorn Sheep Winter Concentration Areas, Bighorn\_WinterConcentrationAreas.  
6 Available: CPW - ArcGIS Online. Accessed: January 8, 2018.
- 7 • USFS Lynx Habitat, LynxHabitat\_PikeSanIsabelNF\_2013. Accessed: October 1, 2017.
- 8 • USFS Mexican Spotted-owl Habitat, MSO habitat.shp. Accessed: January 8, 2018.

9 **2.1.12.3 Limitations/Data Gaps**

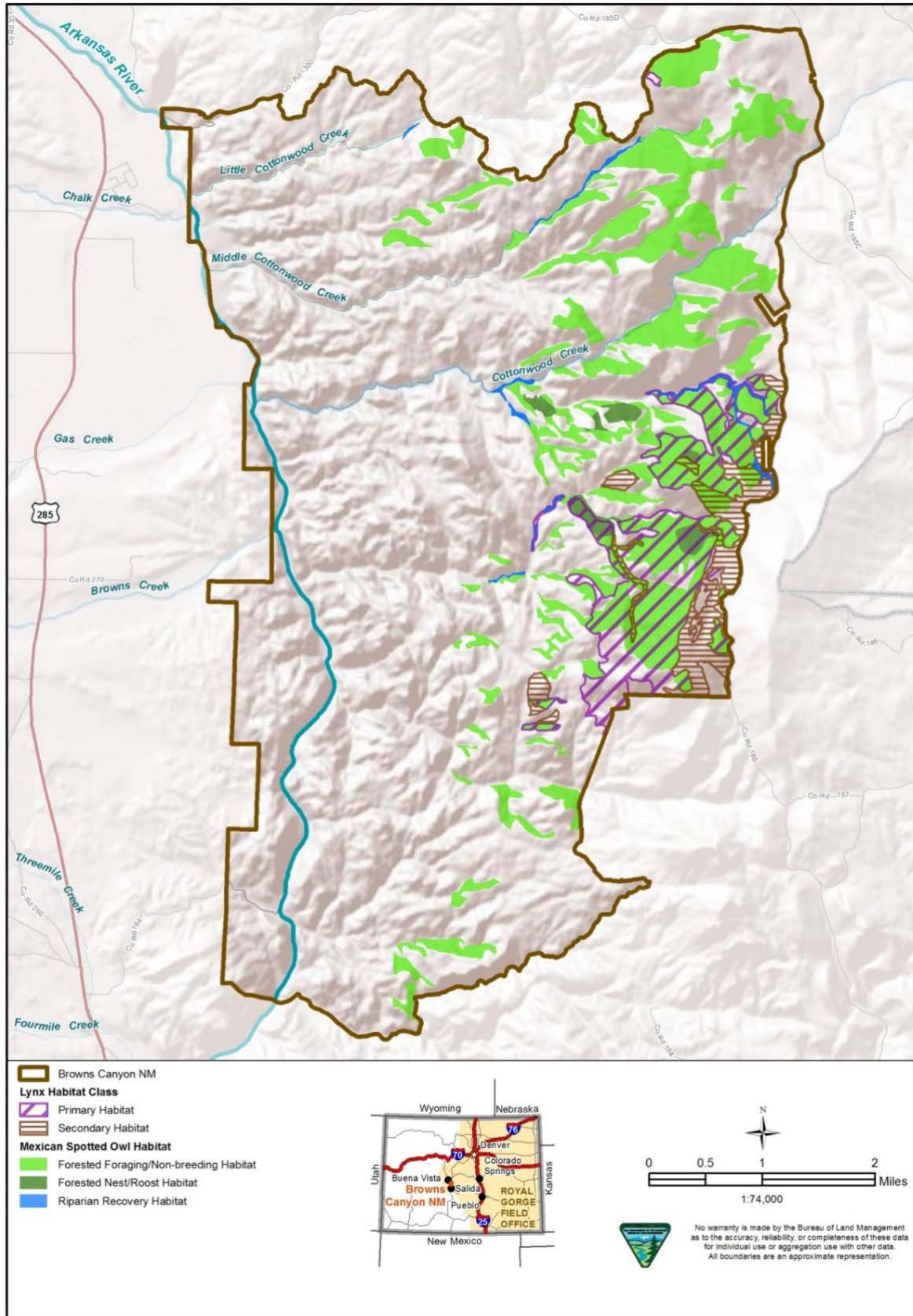
10 A lack of existing information for special status species or habitat known or believed to occur  
11 within the BCNM limits the characterization of wildlife resource conditions and trends for the  
12 planning assessment. Special status species data specific to the BCNM is limited, consisting  
13 mostly of recent observations documented since BCNM’s designation. Data gaps are a result of a  
14 lack of historic survey effort along the river corridor, which leads to a lack of comprehensive  
15 understanding of special status species population trends specific to the area. Steep and rugged  
16 terrain throughout much of the monument area creates challenges for access and has restricted  
17 data collection in some areas. The BLM has limited inventory or monitoring data concerning  
18 wildlife within the BCNM. Most of the designated monument has had no previous project work;  
19 therefore, it has not required data collection to inventory and monitor terrestrial species for  
20 project-level analysis.

21 Limited surveys have been conducted for Mexican Spotted Owl within the BCNM. There are  
22 also records of raptor nests on BLM lands in the BCNM. Few systematic surveys have been  
23 conducted for non-game mammals, with tracking surveys and remote camera traps only  
24 conducted during winter. Bat survey data is limited to mist netting efforts and acoustic surveys  
25 conducted in forested habitats during the Bioblitz (Olson 2017).

26 The planning assessment incorporates available existing data to inform the characterization of  
27 special status conditions and trends; however, the existing data cannot be relied upon completely  
28 to characterize wildlife resource conditions and trends because of their observational nature and  
29 the short time frame over which they have been collected. Other sources, including best available  
30 scientific literature and government wildlife monitoring and/or management reports for species  
31 and habitat occurring within the monument is extrapolated, as appropriate, to inform special  
32 status species resource conditions and trends for the planning assessment. These other sources  
33 include research on wildlife habitat and human-wildlife interactions and USFS reports on  
34 Threatened, Endangered, and Forest Service Sensitive Species of the San Isabel National Forest  
35 (Olson 2015, Wrigley et al. 2012).

1 **2.1.12.4 Existing Conditions and Trends**

2 This planning assessment assumes available habitat within the BCNM could provide suitable  
3 space for several species listed as federally Threatened under the ESA (USFWS), USFS Region  
4 2 sensitive, and BLM sensitive species although most have not been documented within the  
5 BCNM. Two Threatened species, the Mexican spotted owl and Canada lynx have not been  
6 documented in the area, and although models indicate that suitable habitat for both species is  
7 present within the BCNM, these habitats are of marginal quality to sustain either species (Figure  
8 2-12). A list of special status species and a description of habitat and range for each species are  
9 listed in Table 2-26. Determination of whether species were recorded in the BCNM are based on  
10 BASI including the species tracking lists of the Colorado Natural Heritage Program known to  
11 occur in the Upper Arkansas Valley and Northern Arkansas Granitics subsections as defined by  
12 McNab, et al. (2007), published literature, Bioblitz (Olson 2017), and results and data obtained  
13 from a citizen science database managed by the Cornell Lab of Ornithology called eBird (2017).  
14 Ecological drivers and stressors affecting special status species habitat are, considered broadly,  
15 the same as those described in Section 2.1.11, Terrestrial and Avian Wildlife, Section 2.1.7,  
16 Terrestrial Vegetation, and Section 2.1.10, Aquatic Wildlife and include, recreation, livestock  
17 grazing, climate change, and natural disturbances. Appendix B, Species Considered for U.S.  
18 Forest Service Species of Conservation Concern Status also identifies threats and risk factors for  
19 each species considered.



1  
2 **Figure 2-12 Special Status Species Habitat within BCNM**

Table 2-26 BCNM Special Status Species Evaluation

Species	Federal Status <sup>1</sup>	Recorded in BCNM	Potential to Occur	Rationale for Exclusion <sup>2</sup>	Considered for SCC Status	Brief Habitat Description and Range in Colorado
<b>Mammals</b>						
American Hog-nosed Skunk ( <i>Conepatus leuconotus</i> )	FS	No	No	ODR	No	In Colorado, the few records of this species are associated with scrub oak, piñon scrub, and piñon-juniper woodlands in the southeastern part of the state. Rarely associated with heavily timbered habitats. Range in elevation up to 9,000 ft. in Arizona and 10,000 ft. in Mexico.
American Marten ( <i>Martes americana</i> )	FS	No	Yes	n/a	No	Spruce-fir and lodgepole pine mature to old-growth forests with moderate to high density canopy closures and abundant snags and logs; 8,000 – 13,000 ft.
Canada lynx ( <i>Lynx Canadensis</i> )	T	No	Yes	n/a	No	Dense spruce-fir, Douglas-fir, early seral lodgepole pine, mature lodgepole pine with developing understory of spruce-fir & aspen in subalpine zone & timberline, using caves, rock crevices, banks, logs for denning, closely associated with snowshoe hare, which has not been documented within the monument area.
Gunnison’s prairie dog ( <i>Cynomys gunnisoni</i> )	FS, B	Yes	Yes	n/a	Yes	Inhabit shrub- grassland habitat between 6,000 – 12,000 ft. in mesic plateaus, intermountain valleys, benches, and arid lowlands.
Hoary Bat ( <i>Lasiurus cinereus</i> )	FS	Yes	Yes	n/a	Yes	The hoary bat is a solitary, tree-roosting species, expected to live in any habitat with trees. In Colorado, the hoary bat probably occurs statewide, from the plains to timberline. Hoary bats arrive in Colorado in April and are gone by November. Found in Chafee County in 2016 (most recently).



Table 2-26 BCNM Special Status Species Evaluation

Species	Federal Status <sup>1</sup>	Recorded in BCNM	Potential to Occur	Rationale for Exclusion <sup>2</sup>	Considered for SCC Status	Brief Habitat Description and Range in Colorado
Brazilian Free-tailed Bat	FS	No	Yes	n/a	Yes	Habitat is widespread and includes piñon-juniper grasslands and shrublands. Roosts in caves and crevasses.
Fringed myotis ( <i>Myotis thysanodes</i> )	FS,B	No	Yes	n/a	No	Common in oak, piñon and juniper woodlands or ponderosa pine forests at middle elevations. The animals roost in rock crevices, caves, mines, buildings and trees.
North American River Otter ( <i>Lontra canadensis</i> )	FS	No	Yes	n/a	No	Occurs in streams, lakes, reservoirs, wetlands and marine coasts; reintroduction efforts occurred in the upper reaches of both the Arkansas and Platte Rivers in the 1970s.
North American Wolverine ( <i>Gulo gulo luscus</i> )	P	No	No	ODR	No	Alpine & subalpine mature/intermediate timbered areas around natural openings, including cliffs, slides, basins, & meadows, dependent on ungulates, historically in Colorado, extending the length of the Rocky Mts.
Pygmy Shrew ( <i>Sorex hoyi</i> )	FS	No	No	HAB	No	Occupies a wide variety of habitats in the mountains of Colorado at elevations above 9,600 ft. such as subalpine forests, edges of meadows, bogs, willow thickets, aspen-fir forests, and parklands.
Rocky Mountain Bighorn Sheep ( <i>Ovis canadensis canadensis</i> )	FS, B	Yes	Yes	n/a	Yes	Prefers semi-open, precipitous terrain characterized by a mixture of steep and gentle slopes, broken cliffs, rocky outcrops, and canyons.

Table 2-26 BCNM Special Status Species Evaluation

Species	Federal Status <sup>1</sup>	Recorded in BCNM	Potential to Occur	Rationale for Exclusion <sup>2</sup>	Considered for SCC Status	Brief Habitat Description and Range in Colorado
Townsend's Big-eared Bat ( <i>Corynorhinus townsendii pallescens</i> )	FS, B	No	Yes	n/a	Yes	Typically associated with caves and abandoned mines for day roosts and hibernacula, will also use abandoned buildings in western shrubland, piñon-juniper woodlands, and open montane forests in elevations up to 9,500 ft.
<b>BIRDS</b>						
American Bittern ( <i>Botaurus lentiginosus</i> )	FS	No	No	HAB	No	Currently restricted to large, permanent, managed marshes and remaining marshland around large lakes. Typically nest in proximity to suitable foraging areas in or near freshwater wetlands and wet meadows with tall, emergent vegetation, or in grassy, upland areas in close proximity to such wetlands.
Virginia Rail ( <i>Rallus limicola</i> )	FS	No	Yes	n/a	Yes	Breeds in cattail marshes and occasionally in wet meadows, typically with some open water and emergent vegetation. Recorded within five miles of monument boundary, however, habitat within BCNM is limited.
American Peregrine Falcon ( <i>Falco peregrinus anatum</i> )	FS, B	Yes	Yes	n/a	Yes	Wide variety of habitats, selects cliff ledges or rock outcroppings for nesting, preferring high, open cliff faces that dominate the surrounding area.
Bald Eagle ( <i>Haliaeetus leucocephalus</i> )	FS, B	Yes	Yes	n/a	Yes	Near open water including rivers, streams and lakes, nesting and roosting in large ponderosa pine, Douglas-fir, or cottonwood trees in proximity to open water and rivers.
Golden Eagle ( <i>Aquila chrysaetos</i> )	B	Yes	Yes	n/a	No	Occur primarily in mountainous canyon land, rimrock terrain of open deserts and grassland areas. Cliffs are the most common nesting substrate, though trees or man-made structures are also used. Tundra, high- and mid-elevation pine forest, piñon-juniper woodlands, sagebrush and other shrub habitats, grassland, and agricultural habitats are all used by golden eagles.

Table 2-26 BCNM Special Status Species Evaluation

Species	Federal Status <sup>1</sup>	Recorded in BCNM	Potential to Occur	Rationale for Exclusion <sup>2</sup>	Considered for SCC Status	Brief Habitat Description and Range in Colorado
Black Swift ( <i>Cypseloides niger</i> )	FS	No	Yes	n/a	Yes	Nests behind or next to waterfalls and wet cliffs. Forages over forests and open areas.
Boreal Owl ( <i>Aegolius funereus</i> )	FS	No	No	ELE	No	High elevation, subalpine mature and old-growth forests, including mature Engelmann spruce, subalpine fir or spruce-fir and lodgepole pine forests, interspersed with meadows, nesting in cavities in trees larger than 15 inches DBH.
Long-eared Owl ( <i>Asio otus</i> )	FS	No	Yes	n/a	No	Inhabits dense riparian thickets and Douglas-fir forests, usually near open areas. Wide-ranging nocturnal predator of small mammals. Rare summer resident in Colorado, may be a more frequent visitor in the winter.
American White Pelican ( <i>Pelecanus erythrorhynchos</i> )	B	Yes	Yes	n/a	No	Breeding sites include shallow lakes and coastal lagoons. Non-breeding and migratory birds occupy a wider range of freshwater and marsh habitats, including rivers.
Brewer's Sparrow ( <i>Spizella breweri</i> )	FS, B	Yes	Yes	n/a	No	Sagebrush, mountain meadows, and mountain shrub habitat in Colorado.
Flammulated Owl ( <i>Otus flammeolus</i> )	FS	Yes	Yes	n/a	No	Depend on cavities for nesting, open forests for foraging, brush for roosting. Occupy open ponderosa pine or forests with similar features (dry montane conifer or aspen, with dense saplings).
Gunnison Sage-Grouse ( <i>Centrocercus minimus</i> )	FS, B	No	No	ODR	No	Lek sites are characterized by low vegetation with sparse shrubs often surrounded by big sagebrush dominated plant communities below 9200' elevation. Brood rearing habitat is characterized by riparian vegetation of intermittent and perennial streams, springs, seeps and meadows within upland vegetation communities.

Table 2-26 BCNM Special Status Species Evaluation

Species	Federal Status <sup>1</sup>	Recorded in BCNM	Potential to Occur	Rationale for Exclusion <sup>2</sup>	Considered for SCC Status	Brief Habitat Description and Range in Colorado
Lewis's Woodpecker ( <i>Melanerpes lewis</i> )	FS	Yes	Yes	n/a	Yes	Lowland and foothill riparian forests, agricultural areas, urban areas with tall deciduous trees and foothills including wet mountains and grasslands.
Loggerhead Shrike ( <i>Lanius ludovicianus</i> )	FS	Yes	Yes	n/a	Yes	Open riparian areas, montane meadows, agricultural areas, grasslands, shrublands, and piñon-juniper woodlands in western valleys in eastern Colorado.
Mexican spotted owl ( <i>Strix occidentalis lucida</i> )	T	No	Yes	n/a	No	Steep-sided rocky canyons with old-growth mixed conifer (Ponderosa pine, Douglas-fir, white fir) forests possessing cool, shady microclimates; up to 9,500 ft.
Northern Goshawk ( <i>Accipiter gentilis</i> )	FS, B	Yes	Yes	n/a	Yes	Primarily forest habitat, especially in mountains, nesting in lower portions of mature Douglas-fir, ponderosa pine, lodgepole pine, or aspen canopies; prefers mature or old-growth forest structure.
Ferruginous Hawk ( <i>Buteo regalis</i> )	B	No	No	HAB	No	Primarily occurs in sagebrush and open grassland habitats including agricultural areas. Nest sites include ground or hillsides, rocky outcrops, cutbanks, and, less often, man-made structures or trees.
Northern Harrier ( <i>Circus cyaneus</i> )	FS	Yes	Yes	n/a	No	Spring and fall migrant in western valleys mountain parks, and eastern plains in Colorado inhabiting grasslands, agricultural areas, marshes and tundra in the fall; 3,500-13,000 ft.
Olive-sided Flycatcher ( <i>Contopus cooperi</i> )	FS	Yes	Yes	n/a	Yes	Mature spruce/fir or Douglas-fir forests with preference for natural clearings, bogs, stream and lake-shores with water-killed trees, forest burns and logged areas with standing dead trees.

Table 2-26 BCNM Special Status Species Evaluation

Species	Federal Status <sup>1</sup>	Recorded in BCNM	Potential to Occur	Rationale for Exclusion <sup>2</sup>	Considered for SCC Status	Brief Habitat Description and Range in Colorado
White-tailed Ptarmigan ( <i>Lagopus leucurus</i> )	FS	No	No	ELE	No	Inhabit alpine tundra with moist, low-growing alpine vegetation, particularly willows ( <i>Salix</i> spp.) with boulders, in proximity to water.
Yellow-billed cuckoo ( <i>Coccyzus americanus</i> )	FS	No	No	ODR	No	Eastern subspecies: riparian forests along the Arkansas River and urban areas with tall trees; a rare to uncommon spring/fall migrant and summer resident of eastern Colorado and southwestern Kansas, and potentially the San Carlos Ranger District.
Yellow-headed blackbird ( <i>Xanthocephalus xanthocephalus</i> )	FS	No	Yes	n/a	Yes	Breeds in large cattail marshes with areas of open water, mostly below 7,500 feet. No documented occurrences within BCNM, but there are records on the Arkansas River within five miles of the monument.
<b>REPTILES AND AMPHIBIANS</b>						
Boreal Toad ( <i>Anaxyrus boreas boreas</i> )	FS, B	No	No	HAB	No	Breeds in ponds and over-winters in refugia within lodgepole pine, spruce fir forests, and alpine meadows; 7,500-12,000 ft.
Northern Leopard Frog ( <i>Lithobates pipiens</i> )	FS, B	Yes	Yes	n/a	No	Banks and shallow portions of marshes, ponds, lakes, reservoirs, beaver ponds and streams, especially those with rooted aquatic vegetation up to 11,000 ft.
<b>INVERTEBRATES</b>						
Hudsonian Emerald ( <i>Somatochlora hudsonica</i> )	FS	No	No	HAB	No	Breeding sites in quiet water of boggy wetlands, streams, ponds & reservoirs above 9,500 ft. in Colorado; documented in Lake and Park counties; however, distribution in Colorado is unknown; populations appear to be disjunct.

Table 2-26 BCNM Special Status Species Evaluation

Species	Federal Status <sup>1</sup>	Recorded in BCNM	Potential to Occur	Rationale for Exclusion <sup>2</sup>	Considered for SCC Status	Brief Habitat Description and Range in Colorado
Rocky Mountain Capshell ( <i>Acroloxus coloradensis</i> )	FS	No	No	HAB	No	Littoral zone of oligotrophic and mesotrophic mountain lakes with neutral to slightly alkaline water and high dissolved oxygen content; 8,800-9,800 ft.
Susan's purse making caddisfly ( <i>Ochrotrichia susanae</i> )	FS	No	No	HAB	Yes	Local endemic found in springs and seeps in Chaffee and Park counties. Inhabits wetlands found outside of the proposed project area.
Western bumblebee ( <i>Bombus occidentalis</i> )	FS	No	Yes	n/a	Yes	Western Bumblebees inhabit high elevation areas. They are most frequent in montane and subalpine meadows with abundant and diverse wild flower populations.
Monarch Butterfly ( <i>Danaus plexippus plexippus</i> )	FS	Yes	Yes	n/a	Yes	Habitats for Monarch Butterfly are quite diverse, and include forests, woodlands, shrublands, grasslands, cropland, and urban areas. The common factor among habitats is the presence of milkweeds, the larval host plant.
<b>PLANTS</b>						
Brandegee Buckwheat ( <i>Eriogonum brandegeei</i> )	B	Yes	Yes	n/a	Yes	Occurs in open pinion-juniper stands on exposed soil in the upper Arkansas River valley in Chaffee and Fremont counties.
Rock-loving aletes ( <i>Neoparrya lithophila</i> )	B	No	Yes	n/a	Yes	Occurs on volcanic substrates in cracks and shelves usually within minimal talus, and moderate to steep rock outcrops.

Table 2-26 BCNM Special Status Species Evaluation

Species	Federal Status <sup>1</sup>	Recorded in BCNM	Potential to Occur	Rationale for Exclusion <sup>2</sup>	Considered for SCC Status	Brief Habitat Description and Range in Colorado
Arkansas Canyon Stickleaf ( <i>Mentzelia densa</i> )	B	Yes	Yes	n/a	Yes	Grows in naturally disturbed areas such as washed and rocky slopes. Found in dry, open sites often with piñon-juniper or mountain mahogany.
Fendler's False Cloak Fern ( <i>Argyrochosma fendleri</i> )	B	Yes	Yes	n/a	Yes	Occurs on talus and cliff crevices of arid canyonsides, and volcanic substrates within ponderosa pine or piñon-juniper woodlands.
Degener beardtongue ( <i>Penstemon degeneri</i> )	B	No	No	n/a	No	Occurs in piñon-juniper woodlands and montane grasslands in coarse gravelly rock, rocky reddish soil, or cracks of large slabs.
Fendler's Townsend Daisy ( <i>Townsendia fenderli</i> )	B	Yes	Yes	n/a	Yes	Occurs on arid hills and benches in the foothills and montane climate zones from 7,200 to 8,200 feet elevation. These are sparsely vegetated slopes with piñon and juniper, often on gypsum soils.
Pale Blue-eyed Grass ( <i>Sisyrinchium pallidum</i> )	n/a	Yes	Yes	n/a	Yes	Generally found in wet meadows and along stream and lake margins at elevations from 6,300 to 9,700 feet from the foothills to subalpine. Soils are often alkaline, developed in alluvium, colluvium, and residuum.
Colorado Tansy-aster ( <i>Xanthisma coloradoense</i> )	n/a	Yes	Yes	n/a	Yes	Generally found in mountain parks, slopes, rocky outcrops, and dry tundra at elevations ranging from 7,600 to 13,000 feet from the montane to alpine. Soils are generally gravelly, derived from colluvium and residuum. Sites are often limestone, and have little competition from other plants.
Hall's Milkweed ( <i>Asclepias hallii</i> )	n/a	Yes	Yes	n/a	Yes	Generally found in sandy and gravelly soils, on sloping streambanks, in piñon-juniper stands, among sagebrush, and in cottonwood groves. Elevation ranges from 7,400 to 10,000 feet from the plains to montane.

Table 2-26 BCNM Special Status Species Evaluation

Species	Federal Status <sup>1</sup>	Recorded in BCNM	Potential to Occur	Rationale for Exclusion <sup>2</sup>	Considered for SCC Status	Brief Habitat Description and Range in Colorado
Lesser Yellow Lady's-Slipper ( <i>Cypripedium parviflorum</i> )	FS	No	Yes	n/a	No	Inhabits subalpine wetlands as well as a variety of habitats in the lower montane zone including aspen groves and ponderosa pine-Douglas fir forests. Occurs from 6,000 to 9,500 feet. Uncommon and widespread in North America.
Lesser Panicked Sedge ( <i>Carex diandra</i> )	FS	No	Yes	n/a	Yes	Inhabits montane to subalpine willow carrs and rich fens at elevations ranging from 7,000 to 10,000 feet. Wetland obligate species. One record exists 0.25 miles east of the Salida RD.
Richardson Needlegrass ( <i>Achnatherum richardsonii</i> )	FS	No	Yes	n/a	Yes	Found in montane meadows and forests of aspen or lodgepole pine at elevations between 7,500 and 10,000 feet. Occurs in soils developed by alluvium and glacial till.
Barneby's Feverfew ( <i>Pethenium alpinum</i> var. <i>tetraneuris</i> )	FS	No	Yes	n/a	Yes	Occurs in open juniper woodlands on plains bluff tops at elevations from 4,800 to 6,500 feet in soils derived from gypsum and shale. Nearest known occurrence is five miles from BCNM.
Strigose Townsend-Daisy ( <i>Townsendia strigosa</i> )	FS	No	Yes	n/a	Yes	Found in the plains and foothills in sandy or clay soils on dry sites. Occurs at elevations from 5,000 to 6,700 feet.
Livermore Fiddleleaf ( <i>Nama dichotum</i> )	FS	Yes	Yes	n/a	Yes	Found from plains to montane habitats on sandstone and in sandy soils between 5,300 and 10,000 feet. Occurs in piñon-juniper, ponderosa pine, and aspen stands.
Rocky Mountain Phacelia ( <i>Phacelia denticulata</i> )	FS	No	Yes	n/a	Yes	Occurs in rocky or sandy soils on steep forested slopes at elevations from 5,500 to 10,000 feet. Regional endemic found from Wyoming to New Mexico.



**Table 2-26 BCNM Special Status Species Evaluation**

Species	Federal Status <sup>1</sup>	Recorded in BCNM	Potential to Occur	Rationale for Exclusion <sup>2</sup>	Considered for SCC Status	Brief Habitat Description and Range in Colorado
Crandall's Rockcress <i>(Boecheera crandallii)</i>	FS	No	Yes	n/a	Yes	Found in rocky montane to subalpine areas with sagebrush at elevations from 6,500 to 10,600 feet. Also occurs in aspen stands and coniferous woodlands. There are several records of the species' occurrence near BCNM.
Golden Blazingstar <i>(Mentzelia chrysantha)</i>	FS	No	No	HAB	No	Found on unstable, barren limestone, shale, and clay slopes in the Smoky Hill member of the Niobrara formation. Occurs in piñon-juniper woodlands at elevations between 4,700 and 6,900 feet. Local endemic species not known to occur within BCNM.

1 <sup>1</sup>**Status Codes:** **E**=federally-listed endangered; **T**=federally listed threatened; **C**=candidate for federal listing; **P**=proposed for federal listing; **FS**=Forest Service Sensitive; **B**=BLM Sensitive; n/a = Not applicable

2 <sup>2</sup>**Rationale for Exclusion Codes:** **ODR** = outside known distributional range; **HAB** = No habitat in BCNM; **ELE** = Outside of elevational range of species; n/a = Not applicable

4

1 **2.1.12.5 Existing Management Direction**

2 Table 1-2 lists relevant, existing Federal, state, and local management direction for special status  
3 species in the BCNM. In addition, BLM Management Objectives and Direction that are specific  
4 to special status species are presented below. The USFS PSICC LRMP (USFS 1984) does not  
5 identify specific management prescriptions for special status species within BCNM. For existing  
6 management for wildlife and vegetation, refer to those respective sections within this PA.

7 **BLM Royal Gorge Resource Area RMP (Eco-Subregion 1, Arkansas River)**

8 Objective Decisions

- 9 • All special status plant habitat activity planning will be accomplished within IAPs

10 Allocation Decisions

- 11 • None applicable.

12 Action Decisions

- 13 • Special status plants and plant communities habitat will be protected through elimination  
14 of conflicting uses.

- 15 • The relict plant community habitat will be protected through—

- 16 ○ ACEC designation  
17 ○ changes in livestock grazing  
18 ○ no surface occupancy for fluid minerals leasing  
19 ○ closing to locatable mineral entry  
20 ○ closing to mineral materials disposals  
21 ○ OHV restrictions

- 22 • Special status animal species habitat will be protected through elimination of conflicting  
23 uses.

- 24 • Special status animal species habitat will be available for fluid minerals leasing with  
25 timing limitations in—

- 26 ○ bald eagle winter roosting habitat  
27 ○ Mexican spotted-owl habitat  
28 ○ peregrine falcon habitat

- 29 • Special status animal species habitat will have timing limitations for mineral operations  
30 in—

- 31 ○ ferruginous hawk nesting and fledging habitat  
32 ○ bald eagle winter roosting habitat  
33 ○ Mexican spotted owl habitat  
34 ○ peregrine falcon habitat

**2.1.12.6 Needs for Change and Management Opportunities**

Characterization of the existing conditions for special status species is difficult due to limited existing information available for a number of special status species that have the potential to occur within the BCNM. Given the existing and foreseeable potential risks to wildlife as addressed in the Terrestrial and Avian Wildlife section of the planning assessment, the following management opportunities exists in Table 2-27.

**Table 2-27 Needs for Change and Management Opportunities for Special Status Species**

Needs for Change	Management Opportunities
Increased knowledge of special status species is needed to inform management decisions.	Further biological inventories of special status species should be conducted, prioritizing lands within the BCNM that have been identified as suitable habitats for special status species to inform management and implementation decisions. Ground water spring assessments and water aging analysis within BCNM needs to be completed, as these are unique water sources for wildlife, insect, and plants Adaptive management of special status species and their habitats within the monument should be considered and include long-term monitoring of species of concern known to occur in the monument. Partnerships and Citizen Science should be recognized as important tools to fill data gaps in weed inventories, breeding bird surveys, and raptor monitoring.
Further analysis of species listed is needed by USFS to identify species of special concern.	Identify SCC in the BCNM in accordance with USFS 2012 Planning Rule at 36 CFR 219 (2012) and Directives (FSH 1909.12).
Analysis of recreational activities and the potential effects on habitat for species of concern needs to be conducted.	Determine the types of activities, locations, and time periods for activities that present the greatest risk adversely affecting special status species habitat in BCNM. Identify specific management and monitoring prescriptions to protect threatened, endangered, and proposed species in accordance with Forest Service Manual (FSM 2600, Ch. 2670, amended in 2005) and the Region 2 Supplement dated August 29, 2015 (FSM 2600-2015-1).

**2.1.13 Cultural Resources**

Cultural resources are the fragile and nonrenewable physical remains of prehistoric and historical human activity, occupation, or endeavor as reflected in districts, sites, structures, buildings, objects, artifacts, ruins, works of art, architecture, and natural features that were important to human history. Because minimal development has occurred in the BCNM, most of the area has not been inventoried and no professional excavations have occurred. Because development on federal land is a driver for archaeological inventories, there is a strong overlap between recreation access and known cultural resources. Within the context of known surveys, the BCNM has a high ratio of eligible to not eligible sites, which suggests that the area has potential for additional significant resources.

Planning issues and management concerns based on Proclamation 9232 and additional agency concerns include:

- 1       • How should scientific research be conducted if determined to be appropriate through the  
2       planning process?
- 3       • How should the cultural resources and archaeological values (prehistoric and historic) of  
4       the area be protected and preserved, while still allowing for appropriate  
5       information/education efforts?
- 6       • Are any additional special designations necessary to support and enhance the protection  
7       and interpretation of these resources?
- 8       • Where and how will potential increased river and upland recreation, resulting as a  
9       consequence of monument designation, affect cultural resources?
- 10      • How will current and future change agents or drivers such as development in Chaffee  
11      County, climate change, invasive species, fire, and changes in recreational use and  
12      pressure affect monument cultural and paleontological ROVs in the period 2021–2035?
- 13      • What management actions are needed to promote proactive resource identification and  
14      evaluation so that resources are identified before conflicts with other resources arise?
- 15      • How can BLM and FS manage these resources while balancing the need for preservation  
16      of sensitive cultural resources and interpretation of the culture history of the BCNM?
- 17      • What type of partnerships/agreements are needed to meet the  
18      identification/evaluation/preservation objectives while providing opportunities for  
19      research and interpretation?

20   **2.1.13.1   Assessment Area**

21   Areas or properties of archaeological or historical importance will be assessed within the  
22   boundary of the 21,604 acre BCNM.

23   **2.1.13.2   Best Available Scientific Information**

24   The best available scientific information for archaeological resources, both prehistoric and  
25   historical, includes sites defined during archaeological surveys and the synthetic documents  
26   listed below that place those resources in a historical context.

27   Bailey, K., and A. Gray. 2017. Arkansas Headwaters Recreation Area Cultural Resources  
28   Background Report. Report prepared for CPW, BLM, and USFS Forest Service. Unpublished  
29   manuscript.

30   Church, M.C., S.G. Baker, B.J. Clark, R.F. Carrillo, J.C. Horn, C. Späth, D.R. Guilfoyle, and E.S.  
31   Cassells. 2007. Colorado History: A Context for Historical Archaeology. Colorado Council of  
32   Professional Archaeologists, Denver. 600 pp.

33   Eighmy, J.L. 1984. Colorado Plains Prehistoric Context: For Management of Prehistoric  
34   Resources of the Colorado Plains. Office of Archaeology and Historic Preservation, Colorado  
35   Historical Society, Denver. 186 pp.

- 1 Greubel, R.A., J.E. Pfertsh, C. Reed, M. Prouty, S. Millward, J. Omgig, J. Mullen, M. Landt, and  
 2 J. Horn. 2017. Synthetic Cultural Resource Overview of the BLM’s Royal Gorge Field Office,  
 3 Eastern Colorado. BLM, Royal Gorge Field Office. 246 pp.
- 4 Guthrie, M.R., P. Gadd, R. Johnson, J.J. Lischka. 1984. Colorado Mountains Prehistoric Context.  
 5 Colorado Historical Society, Denver. 123 pp.
- 6 Mehls, S.F. 1984. Colorado Mountains Historic Context. Office of Archaeology and Historic  
 7 Preservation, Colorado Historical Society, Denver, Colorado. 137 pp.
- 8 Zier, C.J. and S.M. Kalasz. 1999. Colorado Prehistory: A Context for the Arkansas River Basin.  
 9 Colorado Council of Professional Archaeologists, Denver. 323 pp.
- 10 Table 2-28 presents available survey reports for BCNM.

**Table 2-28 Survey Reports**

<b>Date</b>	<b>Author</b>	<b>Survey Title</b>	<b>Survey I.D.</b>
2013	Weimer, Monica	Browns Canyon Trail Reroute	CF.LM.NR76
2008	Weimer, Monica	Browns Canyon Trail Re-Route	CF.LM.NR61
2007	Weimer, Monica	Trail Re-Route At Seidel's Suckhole	CF.LM.R74
2005	Barclay, Dulaney; Gilmore, Keven; Slaughter, Michelle Elrod, Kendra Wunderlich, Robert Jr., and Martorano, Marilyn	Final Report Of The Salida Range Allotment Project	MC.FS.R477
2002	Weimer, Monica	Ruby Mountain Recreation Site	BLM: 81-24 P
2002	Weimer, Martin	Four Mile Transportation Project	CF.LM.R45
2002	Weimer, Martin	Ruby Mountain Cattleguards	CF.LM.NR49
2002	Wyatt, Bill B.	Hecla Junction Fuels Reduction Project	CF.LM.NR53
2002	Murphy, Megan	Aspen Ridge Allotment Stock Ponds	MC.FS.R263
2000	Weimer, Monica	Road Row For Hecla Junction County Road	CF.LM.NR44
1998	Weimer, Monica M. Bargielski	AHRA R&PP Site Modifications Project	MC.LM.R137
1997	Kennerly, Keri	Green Gulch Prescribed Burn	CF.FS.R22
1996	DeLeuw, Cather & Co.	The Sage To Leadville And Malta To Canon City D&Rg Railroad	MC.IC.R1
1996	Hatch, Sharon	Bald Mountain Gulch Fence Line	BLM: 82-07 N
1992	Spath, Carl	The Mascot 1-5 Mining Claims Road San Isabel National Forest	CF.FS.NR27

**Table 2-28 Survey Reports**

<b>Date</b>	<b>Author</b>	<b>Survey Title</b>	<b>Survey I.D.</b>
1989	Bargielski, Monica	Arkansas River R&PP Sites	MC.LM.R17
1989	Benedict, Tim	Cultural Resource Survey Of The 1989 Salida Stockwater Pits	CF.FS.NR93
1978	Meydrech, Lee	Range Fence (Near Aspen Ridge)	CF.FS.NR21
Unknown	Unknown	Browns Canyon Mining Claims	CF.LM.R102
Unknown	Unknown	Bald Mountain Gulch Spring	BLM: 82-08 N
Unknown	Unknown	Proactive Inventory Of The BCNM	In Progress

**1 2.1.13.3 Limitations/Data Gaps**

2 Survey coverage is very limited and only 3.5 percent of the BCNM has been archaeologically  
 3 inventoried. None of that survey has occurred in areas of difficult terrain or access and there are  
 4 no professional excavations that have been conducted within the BCNM boundary. Recreational  
 5 collection has limited, and will continue to limit, the interpretative potential of cultural resources,  
 6 especially if those sites are easily accessible.

7 The following assumptions apply: unknown site distribution will reflect the type and location  
 8 characteristics expressed by the known site assemblage. Resources in areas of high public use  
 9 have been impacted by recreational surface collections. Sites located along the river will often  
 10 have buried components and comparatively large artifact assemblages, and previously  
 11 documented sites along the river are almost unanimously underestimated and under-recorded.

**12 2.1.13.4 Existing Conditions and Trends**

13 There have been 30 archaeological surveys that cover 725 acres or 3.5 percent of the BCNM.  
 14 Those surveys have identified 34 sites in the BCNM; 24 of which are prehistoric, nine are  
 15 historical, and one has both a prehistoric and historical component. The prehistoric sites are  
 16 mainly scatters of chipped stone (n = 17), though short-term camps (n = 7), whether open-air (n  
 17 = 6) or in a rockshelter (n = 1) are present. The historical sites are related to mining and include  
 18 isolated features and artifacts (n = 2), adits (n = 2), and mines (n = 3), as well as a mining camp  
 19 and a section of a historical railroad grade that was used to get the ore out of the mountains. The  
 20 multicomponent site is a prehistoric short-term camp with tipi rings that contains an isolated  
 21 historical wall alignment. Of the sites that have been weighed against the criteria for listing in the  
 22 National Register of Historic Places (NRHP), as outlined in 36CFR60, six are eligible and 13 are  
 23 not. Fifteen of the sites have not been evaluated against the criteria for significance. Of the six  
 24 eligible cultural resources, four are prehistoric, which include both short-term camps and artifact  
 25 scatters, one is the railroad grade, and one has both a prehistoric and historical component. That  
 26 is, the majority of the identified prehistoric resources are eligible for listing in the NRHP while

1 the majority of historical ones are not. The ratio of eligible to not eligible sites is high,  
2 suggesting that the area has potential for additional significant resources.

### 3 **Drivers and Stressors**

4 Because sites are the fragile and nonrenewable physical remains of prehistoric and historical  
5 activities, downward trends in sites are directly related to impacts that alter the physical  
6 condition of the site (e.g., erosion, vandalism, or development) and upward trends are related to  
7 the identification of new sites. Upward trends are typically related to increased development that  
8 leads to the identification of previously unrecorded sites, though they are technically not new  
9 sites. While an upward trend adds to our knowledge base, the condition of sites is generally  
10 considered to be declining. Whether cultural resources are identified or not, the physical remains  
11 of past activities are degrading due to natural erosional processes, decay and deterioration,  
12 animal and human intrusion, and development or maintenance activities.

#### 13 **2.1.13.5 Existing Management Direction**

14 Table 1-2 lists relevant, existing Federal, state, and local management direction for cultural  
15 resources in the BCNM. The primary legal mandates applicable to the management of cultural  
16 resources include:

- 17 • Antiquities Act of 1906, as amended (16 U.S.C. 431–433)
- 18 • National Historic Preservation Act of 1966, as amended (54 U.S.C. § 300101 et seq.) and  
19 implementing regulations (36 CFR part 800)
- 20 • Archaeological and Historic Preservation Act of 1974 (16 U.S.C. 469–469c), as amended
- 21 • Archaeological Resources Protection Act of 1979, as amended (16 U.S.C. 470aa–  
22 470mm) with implementing provisions (43 CFR 7)
- 23 • Native American Graves Protection and Repatriation Act of 1990, as amended (25 U.S.C.  
24 3001 et seq.)

25 In addition, Federal, BLM Management Objectives and Direction, and USFS Management  
26 Prescriptions that are specific to cultural resources are presented below.

27 The Royal Gorge Resource Area RMP (BLM 1996) includes the following objectives for  
28 cultural resource management:

- 29 • Information potential of cultural resources will be developed to the maximum extent  
30 possible through appropriate studies and promoted with interested educational  
31 institutions.
- 32 • Interpretation and recreational use of sites will be developed within IAPs
- 33 • Conservation of cultural resources will be provided through designation of Browns  
34 Canyon and Arkansas Canyonlands ACECs.

1 **Royal Gorge Resource Area RMP Eco-Subregion 1 (Arkansas River)**

2 Archaeological Resources

3 Objective Decisions

- 4 • Information potential will be developed to the maximum extent possible through  
5 appropriate study.

6 Allocation Decisions

- 7 • Conservation of archaeological resource will be provided through designation of Browns  
8 Canyon and Arkansas Canyonlands ACECs.

9 Action Decisions

- 10 • Information potential will be promoted through involvement with interested educational  
11 institutions. Active programs for interpretive and recreational use of archaeological sites  
12 will be developed within IAPs.

13 **Royal Gorge Resource Area RMP Eco-Subregion 1 (Arkansas River)**

14 Historical Resources

15 Objective Decisions

- 16 • Information potential will be used for interpretation and scientific values. Sites will be  
17 used for their interpretive value.

18 Allocation Decisions

- 19 • Conservation of historical resources will be provided through:  
20 ○ Designation of Browns Canyon and Arkansas Canyonlands ACECs
- 21 • Conservation of potential NRHP sites will be provided through:  
22 ○ Standard lease stipulations for fluids  
23 ○ Closed to mineral entry  
24 ○ No mineral materials disposal  
25 ○ OHV use limited to designated roads and trails  
26 ○ Conservation of potential NRHP sites will be provided as follows:  
27 ■ Standard lease stipulations for fluids  
28 ■ Closed to mineral entry  
29 ■ No mineral materials disposal  
30 ■ OHV use limited to designated roads and trails

31 Action Decisions



- 1 • Information potential will be promoted through involvement with educational  
2 institutions.
- 3 • Active programs for interpretive scientific and recreational use of the historic site will be  
4 developed within IAPs.

5 **2.1.13.6 Needs for Change and Management Opportunities**

6 Given the limited site information available in the BCNM and stressors that degrade the physical  
7 remains of cultural resources, future management should be directed towards proactively  
8 increasing upward trends. Management should focus on the identification of previously  
9 unrecorded sites and assessing the eligibility of sites that have not been weighed against the  
10 NRHP criteria. Given the difficulty of accessing portions of the BCNM, initial identification  
11 could use spatial modeling within the context of ethnographic and historical information to  
12 indicate likely locations of eligible cultural resources, which can then be confirmed with focused  
13 pedestrian surveys. To increase upward trends in cultural resources, future management should  
14 work to proactively identify cultural resources while promoting their scientific value and  
15 interpretive potential.

16 **2.1.14 Tribal Concerns**

17 Planning issues and management concerns based on Proclamation 9232 and additional agency  
18 concerns include:

- 19 • What areas within the larger landscape are considered sacred sites or landscapes by  
20 Native Americans and what management measures are needed to ensure that traditional  
21 uses are able to occur and sites are protected?
- 22 • Are any additional special designations necessary to support and enhance the protection  
23 and interpretation of these resources?
- 24 • How will current and future change agents or drivers such as development in Chaffee  
25 County, climate change, invasive species, fire, and changes in recreational use and  
26 pressure affect monument cultural and paleontological ROVs in the period 2021–2035?
- 27 • What management actions are necessary to provide for access and use by present and  
28 future tribal generations?
- 29 • How can BLM and FS maintain and improve natural and cultural conditions to enhance  
30 opportunities for tribal use of cultural landscapes and properties? How can BLM and FS  
31 best respond to tribal concerns?
- 32 • How can BLM and FS best incorporate tribal information into management and  
33 interpretation of the monument while maintaining confidentiality?
- 34 • How can BLM and FS incorporate the tribes in future inventory and identification  
35 efforts?

1 **2.1.14.1 Assessment Area**

2 Areas of tribal, traditional, or cultural importance will be assessed within the boundary of the  
3 BCNM specifically and concerns relevant to the larger Upper Arkansas River Basin will also be  
4 considered.

5 **2.1.14.2 Best Available Scientific Information**

6 The best available information is first-hand accounts and traditional cultural knowledge of the  
7 objects, resources, and values within the assessment area provided by tribal representatives. The  
8 objects, resources, and values of concern to Native Americans include both the natural  
9 environment (plant and animal communities, as well as soil, water, and air resources) and the  
10 human environment (archaeological and cultural resources, and traditional cultural properties).

11 The BLM and USFS extended a consultation invitation to the following tribes:

Apache Tribe of Oklahoma	Northern Ute Tribe	Pueblo of Santa Ana
Cheyenne and Arapaho Tribes of Oklahoma	Oglala Lakota Tribe	Pueblo of Santo Domingo
Cheyenne River Lakota Tribe	Pawnee Nation of Oklahoma	Pueblo of Zuni
Comanche Tribe of Oklahoma	Pueblo of Acoma	Rosebud Sioux Tribe
Crow Creek Sioux	Santa Clara Pueblo	San Ildefonso Pueblo
Jicarilla Apache Nation	Pueblo de Cochiti	Shoshone Tribe
Kiowa Tribe of Oklahoma	Pueblo of Laguna	Southern Ute Tribe
Navajo Nation	Pueblo of Nambe	Standing Rock Sioux Tribe
Northern Arapaho Tribe	Pueblo of Ohkay Owinegh	Taos Pueblo
Northern Cheyenne Tribe	Pueblo of Picuris	Ute Mountain Ute Tribe

12 At present, only the three Ute Tribes and Rosebud Sioux tribe have provided comments, though  
13 consultation is ongoing and there will be opportunities for tribal input throughout the planning  
14 process. The Ute have identified a highly-sensitive Traditional Cultural Property (TCP) within  
15 the BCNM.

16 Invitations to consult were sent in October of 2016, February of 2017, and December of 2017.  
17 The BCNM was a point of discussion during face-to-face meetings with the three Ute Tribes  
18 (October 2016) and with the Rosebud Sioux (April 2017). Both face-to-face meetings included a  
19 tour of the BCNM.

20 **2.1.14.3 Limitations/Data Gaps**

21 No systematic ethnohistoric synthesis has been produced for the area, nor has one been produced  
22 within the larger Upper Arkansas region. The Southern Ute Tribe, Ute Tribe, Ute Mountain Ute

1 Tribe, and Rosebud Sioux Tribe have visited the BCNM and have identified at least one area of  
2 traditional significance.

3 Aside from the current planning effort, there has been no systematic effort to identify tribal  
4 concerns within the BCNM. Accordingly, there is a paucity of information regarding past and  
5 present tribal uses of the BCNM specifically, and of the Upper Arkansas region more broadly.

6 The very limited formal archaeological surface inventory within the BCNM also conditions the  
7 number of known traditional cultural properties. As more of the BCNM is inventoried, more  
8 traditional cultural properties are likely to be found.

#### 9 **2.1.14.4 Existing Conditions and Trends**

10 Increased visitation and use will likely increase tribal concerns and opportunities for conflict  
11 with other uses. However, given the limited information on current and past tribal uses, specific  
12 conditions and trends cannot be identified at present.

#### 13 **2.1.14.5 Existing Management Direction**

14 References that are laws, orders, handbooks, or LUPs are stated one time in Table 1-2 to reduce  
15 redundancy. The existing management direction for tribal concerns centers around two primary  
16 issues:

- 17 • Ensure that ecological landscapes and culturally sensitive locations are protected,  
18 conserved, and managed to allow access and use by present and future tribal generations.  
19 Maintain and improve, where possible, natural and cultural conditions to enhance  
20 opportunities for tribal use of cultural landscapes and cultural properties. These  
21 landscapes and properties may include, but are not limited to, objects, resources, and  
22 values of both the natural environment (plant and animal communities, as well as soil,  
23 water, and air resources) and the human environment (archaeological and cultural  
24 resources, and traditional cultural properties).
- 25 • Ensure that Native American human remains that are discovered on public lands are  
26 afforded proper care and respect, and are properly managed according to the Native  
27 American Graves Protection and Repatriation Act of 1990.

28 The primary legal and policy mandates applicable to the management of tribal uses within the  
29 planning area include:

- 30 • 16 U.S.C. 470, National Historic Preservation Act
- 31 • American Indian Religious Freedom Act of 1978 (42 U.S.C. 1996)
- 32 • Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 3001)
- 33 • Executive Order 13007, Protection and Preservation of Native American Sacred Sites
- 34 • Executive Order 13175, Consultation and Coordination with Indian Tribal Governments

- 1 • BLM Manual 8120, Tribal Consultation Under Cultural Resource Authorities
- 2 • BLM Manual H-1780-1 – Improving and Sustaining BLM-Tribal Relations
- 3 • BLM IM No. CO-2000-016, Disposition Policy on Native American Graves Protection
- 4 and Repatriation Act (NAGPRA) Repatriated Museum Collections
- 5 • BLM IM No. WO-2004-052, Assessing Tribal and Cultural Considerations as Required
- 6 in IM-2003-233, Integration of the Energy Policy and Conservation Act (EPCA)
- 7 Inventory Results into the Land Use Planning Process
- 8 • BLM IM No. WO-2005-003, Cultural Resources and Tribal Consultation and Fluid
- 9 Minerals Leasing
- 10 • BLM IM No. WO-2007-002, Disposition Policy on Native American Graves Protection
- 11 and Repatriation Act Repatriated Museum Collections
- 12 • H.R. 2419, Food, Conservation, and energy Act of 2008, Subtitle B – Cultural and
- 13 Heritage Cooperation Authority, Section 8103
- 14 • FSM 2300, Recreation, Wilderness, and Related Resource Management, Chapter 2360 –
- 15 Heritage Program Management.
- 16 • FSM 2361.22, Consultation With Indian Tribes
- 17 • FSM 2361.3, Native American Graves Protection Act Consultation

18 **2.1.14.6 Needs for Change and Management Opportunities**

19 Given the conditions and trends for tribal concerns, Table 2-29 summarizes needs for change and  
 20 management opportunities to consider in the BCNM MP.

21 **Table 2-29 Needs for Change and Management Opportunities for Tribal Concerns**

Needs for Change	Management Opportunities
Given the limited information regarding tribal use of the BCNM, future management opportunities should be aimed at proactively identifying and providing access to traditional cultural properties and landscapes.	In collaboration with interested tribes, develop a proactive inventory program to located and document traditional cultural properties, sacred sites, traditional uses, and cultural landscapes.  In collaboration with interested tribes, identify ways to improve access and use of culturally sensitive locations and ecological landscapes.

22 **2.1.15 Visual Resources**

23 The term “visual resources” refers to the composite of basic terrain, geologic, and hydrologic  
 24 features, vegetative patterns, and built features that influence the socially valued visual appeal of  
 25 a landscape. ROVs for visual resources as identified in Proclamation 9232 are “the rugged  
 26 granite cliffs, colorful rock outcroppings, and stunning mountain vistas of Browns Canyon that  
 27 form an iconic landscape attracting visitors from around the world”.

1 This section identifies existing visual resources and management objectives within BCNM, and  
2 where possible, trends that may influence the visual landscape within and adjacent to BCNM.  
3 The scope of this report includes the description and identification of existing BLM Visual  
4 Resource Management (VRM) objectives and USFS Visual Quality Objectives (VQOs) as well  
5 as trends and management opportunities associated with 9,759 acres and 11, 830 acres of BLM  
6 and USFS managed lands within BCNM.

7 Planning issues and management concerns based on Proclamation 9232 and additional agency  
8 concerns include:

- 9 • How can monument visibility, visual resources (contrast, color, foreground, background),  
10 scenery degradation risk be mitigated to address degraded social amenity value to BCNM  
11 use and enjoyment?

#### 12 **2.1.15.1 Assessment Area**

13 The BCNM boundary is the geographic area and extent considered for characterizing the  
14 conditions and trends of visual resources. Activities and uses on lands adjacent to and within the  
15 viewshed of BCNM affect the visual sensitivity of BCNM and vice-versa. The BCNM  
16 boundaries are not apparent at a landscape scale (i.e., vegetation changes), therefore BCNM's  
17 distinctive geological and river features are often observed within a tapestry of adjacent lands,  
18 such as views from U.S. 285.

#### 19 **2.1.15.2 Best Available Scientific Information**

20 The Best Available Scientific Information in the form of data and reports is listed below:

21 BLM. 2017. Draft Wild & Scenic River Suitability Report- Royal Gorge Field Office. February  
22 2017.

23 BLM. Royal Gorge Field Office Visual Resource Inventory. 2015

24 USFS, Consensus Building Institute, University of Colorado at Colorado Springs. 2017. Social  
25 Landscape Assessment of BCNM. August 2017.

#### 26 **GIS Data**

- 27 • BLM RGFO Visual Resource Inventory (VRI), multiple GIS layers. Accessed: January 9,  
28 2018.
- 29 • USFS Visual Quality Objectives (VQO), PSI\_MgtAreasFP1984. Accessed: January 9,  
30 2018.
- 31 • USFS Existing Visual Condition (EVC), EVC092209. Accessed: 2018
- 32 • BLM Wild and Scenic Rivers, BLM\_CO\_WildAndScenicRivers\_20170802. Accessed:  
33 January 9, 2018.

- 1       • NPS 2014 Nationwide Rivers Inventory, Online database. U.S. Department of the  
2       Interior, National Park Service. Available:  
3       <http://www.nps.gov/nrcr/programs/rtca/nri/index.html>.
- 4       • BLM RGFO VRM Classes, vrm\_data. Accessed: January 9, 2018.

5 For context, The BLM and the USFS have developed formal systems to inventory visual  
6 resources on the lands under their jurisdiction, evaluate visual change in the landscape, and  
7 manage visual resources under their jurisdiction.

8 The BLM uses the VRM System to classify and manage visual resources on lands under its  
9 jurisdiction. The VRM System involves inventorying scenic values, establishing management  
10 objectives for those values through the resource management planning process, and then  
11 evaluating proposed activities to determine whether they conform to the management objectives  
12 (BLM 1984). The BLM’s VRM System incorporates scenic quality, viewer sensitivity, and  
13 distance zones to identify visual resource inventory (VRI) classes. These classes represent the  
14 relative value of the existing visual landscape, as well as the visual resource baseline from which  
15 to measure impacts that a proposed project may have on these values. In its planning process, the  
16 BLM weighs visual and competing resource values and designates the VRM classes, with  
17 associated management class objectives for a given area’s visual setting. The assignment of one  
18 of four VRM classes (Table 2-30) becomes an important component of the BLM’s RMP for the  
19 area.

**Table 2-30 BLM Visual Resource Management Class Objectives**

VRM Class	Management Objective
I	The objective of this class is to 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.
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.
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.
IV	The objective of this class is to provide for management activities which require major modifications 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.

Source: BLM 1986

1 The USFS originally implemented a Visual Management System (VMS) in 1974 to inventory,  
 2 evaluate, and manage lands for visual resource values, as described in Chapter 1 of the National  
 3 Forest Landscape Management handbook (USFS 1974). In 1995, the visual resource  
 4 management guidelines and monitoring techniques evolved into the Scenery Management  
 5 System (SMS), as described in Landscape Aesthetics: A Handbook for Scenic Management  
 6 (USFS 1995). While the overall visual resource framework is similar between the two systems,  
 7 the terminology within the SMS has been modified slightly, and it also provides more complete  
 8 science because it incorporates assessment of biological, physical, and social/cultural resources  
 9 and values within a geographic area. National direction has been given to incorporate, as  
 10 applicable, the methods and philosophy of the SMS with each new planning project; therefore  
 11 the BCNM RMP will incorporate the methods and philosophy of the SMS as appropriate. A  
 12 cross-cross walk between VMS and SMS is provided in Table 2-31.

**Table 2-31 Correlation of USFS VMS and SMS Terminology and Objectives**

<b>Terminology</b>	
<b>VMS</b>	<b>SMS</b>
Characteristic Landscape	Existing Landscape Character
Variety Class	Scenic Attractiveness
Sensitivity Levels	Concern Levels
Seen Area	Landscape Visibility
Visual Quality Objectives	Scenic Integrity Objectives
<b>Visual Quality Objectives (VQO)</b>	<b>Scenic Integrity Objectives (SIO)</b>
Preservation (P)	Very High (VH)
Retention (R)	High (H)
Partial Retention (PR)	Moderate (M)
Modification (M)	Low (L)
Maximum Modification (MM)	Very Low (VL)

13 The Pike and San Isabel National Forest Land and RMP was published in 1984 and therefore  
 14 uses the former VMS provisions and classifications. Visual quality objectives (VQO) are  
 15 assigned to the landscape to describe the degree of acceptable visual alteration of the natural  
 16 landscape (Table 2-32). Each VQO indicates the acceptable degree of landscape change by  
 17 assigning lands in one of five categories: Preservation, Retention, Partial Retention,  
 18 Modification, or Maximum Modification. Preservation allows for ecological changes only, while  
 19 Maximum Modification allows for landscape changes that may dominate the natural landscape  
 20 character.

1 The 1995 USFS SMS system is integrated with ecosystem management and addresses landscape  
 2 character, constituent preferences, scenic integrity, and landscape visibility as key aesthetic  
 3 considerations. Landscape character describes the visual patterns of form, line, color, texture,  
 4 dominance, scale, and diversity of elements in the landscape and the cultural attributes that make  
 5 the landscape identifiable and give it a “sense of place.” Landscape character also considers  
 6 ecosystem dynamics and the natural range of variability within the landscape. Constituent  
 7 preferences convey the aesthetic experience of National Forest visitors, communities, and  
 8 tourists and the relative significance of scenic quality to these user groups. Scenic integrity refers  
 9 to the level of intactness of (or, conversely, the degree of deviation from) the existing or desired  
 10 landscape character. Scenic integrity levels (SILs) are classified as “very high,” “high,”  
 11 “moderate,” “low,” and “very low” and are used in much the same way as VQOs (Table 2-32).  
 12 When SILs are assigned to a particular area through a land management plan decision they  
 13 become Scenic Integrity Objectives (SIOs) for that area. An optional SMS inventory concept is  
 14 "scenic stability" of the valued scenery – an assessment of the degree to which existing scenic  
 15 integrity is likely to persist given current ecological and social conditions.

**Table 2-32 USFS Scenic Integrity Levels (Scenery Management System)**

Level	Scenic Integrity Levels
Very High	Management activities are not visually evident. The valued landscape character is intact with only minute, if any, deviations.. The existing landscape character and sense of place is expressed at the highest possible level.
High	Management activities are not visually evident to the casual observer. The landscape character appears intact. Deviations may be present but must repeat the form, line, color, texture, and pattern common to the landscape character so completely and at such scale that they are not evident. Changes in the qualities of size, amount, intensity, direction, pattern, etc., should not be evident.
Moderate	This refers to landscapes where the valued landscape character “appears slightly altered.” Noticeable deviations must remain visually subordinate to the landscape character being viewed
Low	This refers to landscapes where the valued landscape “appears moderately altered.” Deviations begin to dominate the valued landscape character being viewed, but they borrow valued attributes such as size, shape, edge effect, and pattern of natural openings, vegetation type changes, or architectural styles outside the landscape being viewed. Attributes should not only appear as valued character outside the landscape being viewed, but compatible or complimentary to the character within
Very Low	This refers to landscapes where the valued landscape character “appears heavily altered.” Deviations may strongly dominate the valued landscape character. They might not borrow from valued attributes such as size, shape, edge effect, and the landscape being viewed. However, deviations must be shaped and blended with the natural terrain landforms so elements such as unnatural edges, roads, landings, and structures do not dominate the composition.

Table Source: USFS 1995



- 1 The BLM and USFS objectives can generally be correlated as shown in Table 2-33 to prepare
- 2 seamless management objectives across the BCNM.

**Table 2-33 Correlation of BLM VRM and USFS SMS Objectives**

<b>Terminology</b>	
BLM Visual Resource Management Classes	SMS Scenic Integrity Objectives
VRM Class I	Very High (VH)
VRM Class II	High (H)
VRM Class III	Moderate (M)
VRM Class IV	Low (L)
(not an objective)	Very Low (VL)

3 **2.1.15.3 Limitations/Data Gaps**

4 The Forest and Rangeland Renewable Resources Planning Act of 1974, as amended by the  
 5 National Forest Management Act of 1976 (16 U.S.C. 1601) directs the Secretary of Agriculture  
 6 to develop and keep current a comprehensive inventory of all National Forest System lands.  
 7 Inventory information associated with USFS lands is a data gap and would assist in  
 8 understanding 1984 VMS management decisions and developing a range of MP-EIS alternatives.

9 **2.1.15.4 Existing Conditions and Trends**

10 The BCNM’s diverse landscape character contains undulating rounded landforms along with  
 11 rugged and broken exposed rock outcrops and boulder fields bisected by long linear drainages  
 12 that flow west to the Arkansas River. The drainages that bisect the various landforms are an  
 13 intermix of ephemeral water courses lined with pockets of riparian vegetation, which contrast  
 14 with the dominant species of piñon-juniper and conifers that blanket much of the BCNM.  
 15 Manmade or human development is localized along the western bounds of BCNM and consists  
 16 primarily of recreational facilities and a railroad grade that parallels the Arkansas River.  
 17 Development associated with the town of Nathrop and dispersed residential development along  
 18 and adjacent to State Highway 285 is present and visible west of and adjacent to the BCNM  
 19 (BLM 2015).

20 The Arkansas River, which parallels the western boundary of the BCNM, is a dramatic landscape  
 21 contained primarily within an incised and dramatic exposed granite canyon. The free flowing  
 22 river and associated riparian vegetation, which contrast with the surrounding landforms and  
 23 vegetation, are a dominant feature in the BCNM that adds visual variety and interest. The  
 24 scenery associated with Arkansas River corridor in the area of BCNM has been identified as an  
 25 Outstanding Remarkable Value as part of the 2017 Draft Wild and Scenic River Suitability

1 Report additionally scenic values are identified as a component of the Brown’s Canyon ACEC  
2 designation.

3 The 2015 RGFO Recreation Planning Report found that the top reason that made special places  
4 “special” was scenic quality (70%) (Casey 2015). Other visual resource reasons were “remote  
5 and rugged” (40%), “wild, unspoiled, natural” (40%), “lack of development or improvements”  
6 (30%), and “dark night skies” (12%).

7 The PSICC NVUM 2011 found that the top three forest-wide recreation activities were scenery  
8 dependent: viewing natural features (55%), hiking/walking (49%), and driving for pleasure  
9 (42%).

10 The 2015 BLM VRI found the following conditions:

- 11 • Sensitivity Level: Sensitivity levels associated with the Upper Arkansas Valley to  
12 include lands associated with BCNM are considered High as a result of the importance of  
13 recreation destinations, heritage landscapes and the iconic Colorado setting.
- 14 • Scenic Quality Rating: The variety in landforms and vegetation, the prominence of water,  
15 variety in color combinations and adjacent scenery associated with Buffalo Peaks and the  
16 Collegiate Peaks provided for an overall Scenic Quality score of A (score 22.5) , the  
17 highest score on a scale of A to C.
- 18 • Visibility: Highway 285 and the Arkansas River corridor were selected as visual distance  
19 zone platforms within the area of BCNM. BSNM occurs within the  
20 foreground/middleground distance zone area, with isolated areas of seldom seen as a  
21 result of topography.
- 22 • VRI Inventory Class: VRI Class II was assigned to BLM lands associated with BCNM,  
23 prior to National Monument Designation, based on the above inventory components. VRI  
24 Class I was assigned as an overlay to approximately 7,463 acres associated with Brown’s  
25 Canyon Wilderness Study Area (WSA). Per BLM Manual 8410, Class I is assigned to  
26 those areas where a management decision has been made previously to maintain a natural  
27 landscape including the wild section of wild and scenic rivers and other congressionally  
28 and administratively designated areas where decisions have been made to preserve a  
29 natural landscape.

### 30 **2.1.15.5 Existing Management Direction**

31 The 1996 RGRMP and the 1984 Forest Plan have been reviewed for current management  
32 direction associated with visual and scenic objectives for lands managed as part of BCNM.  
33 Within the BCNM, approximately 9,238 acres (95 percent of the total BLM acres) are currently  
34 managed as VRM Class II and 521 acres (5 percent of the total) are managed as VRM Class III  
35 (BLM 1996). The remainder of the BCNM, approximately 61 acres (>1 percent of the total  
36 USFS acres), are currently managed as Moderate SIO and 11,769 acres (99 percent of the total)

1 are managed as Low SIO, using the SMS terminology (USFS 1984) (Figure 2-13). Table 2-34  
 2 provides the current BLM and USFS management objectives within BCNM.

**Table 2-34 BLM Visual Resource Management Classes and USFS VMS Visual Quality Levels for BCNM**

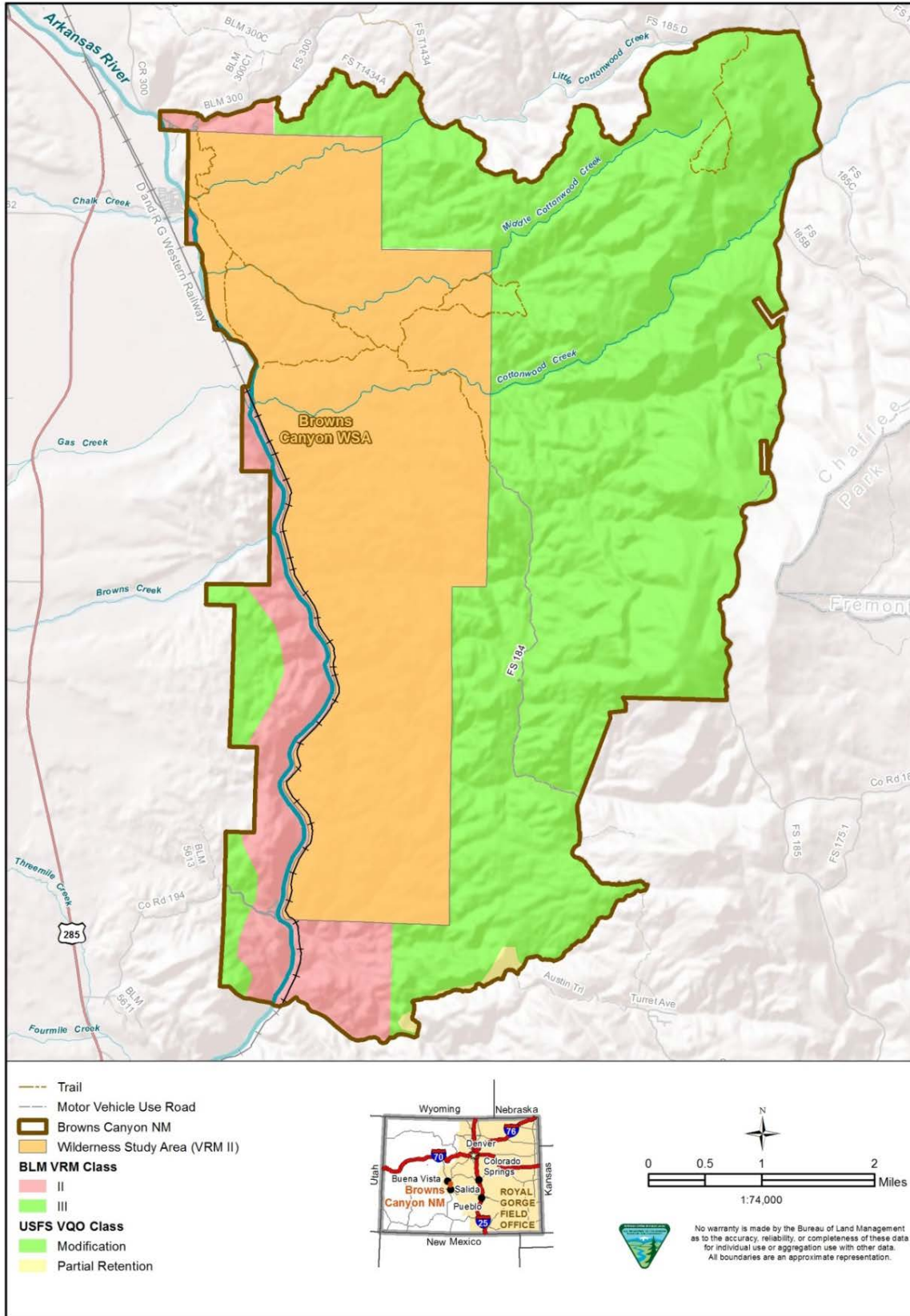
<b>BLM Visual Resource Management Classes</b>	<b>Acres Within BCNM</b>	<b>USFS Scenic Integrity Objectives</b>	<b>Acres within BCNM</b>
VRM Class I	0	Very High (VH)	0
VRM Class II	9,238	High (H)	0
VRM Class III	521	Moderate (M)	61
VRM Class IV	0	Low (L)	11,769
N/A	N/A	Very Low (VL)	0
<b>Total</b>	<b>9,759</b>		<b>11,830</b>

Sources: BLM 1996, USFS 1984

3  
 4 Additional management guidance is contained in:

- 5 • The Multiple-Use Sustained-Yield Act of 1960 (16 U.S.C. 528 (note)) authorizes and  
 6 directs the Secretary of Agriculture “to develop and administer the renewable surface  
 7 resources of the National Forests” with “harmonious and coordinated management of the  
 8 various resources. with consideration being given to the relative values of the various  
 9 resources, and not necessarily the combination of uses that will give the greatest dollar  
 10 return or the greatest unit output.”
- 11 • The Forest and Rangeland Renewable Resources Planning Act of 1974, as amended by  
 12 the National Forest Management Act of 1976 (16 U.S.C. 1601) directs the Secretary of  
 13 Agriculture to prepare land management plans which provide for outdoor recreation and  
 14 to develop and keep current a comprehensive inventory of all National Forest System, as  
 15 well as state and private, lands and resources. Section 6 of this act requires an assessment  
 16 of potential aesthetic impacts during the interdisciplinary review of proposed timber sale  
 17 areas that would include clearcutting and other cuts designed to regenerate an even-aged  
 18 stand of timber. It also specifies treatment of cut blocks and protection of aesthetic  
 19 resources, and directs that multiple use and sustainable yield guidelines be used with  
 20 private lands involved with Government programs.
- 21 • The National Forest Management Act of 1976 (16 U.S.C. 1600 (note)) requires that the  
 22 removal of trees, portions of trees, or forest products “be compatible with multiple use  
 23 resource management objectives in the affected area.”

24



1  
2 **Figure 2-13 Current VRM and VQO Objectives within BCNM**

- 1       • The rules at Title 36 of the Code of Federal Regulations, Part 219, Subpart A, National  
2       Forest System Land and Resource Management Planning (36 CFR part 219, subpart A),  
3       include requirements for consideration, treatment, and protection of intangible resources  
4       such as scenery and aesthetics.
- 5       • The rules at Title 36 of the Code of Federal Regulations, Part 251, Subpart B, Special  
6       Uses (36 CFR part 251, subpart B), include requirements for permittees or holders to  
7       minimize damage to scenic and aesthetic values.
- 8       • The rules at Title 36 of the Code of Federal Regulations, Part 223, Sale and Disposal of  
9       National Forest System Timber (36 CFR part 223), include requirements for protection of  
10      environmental quality and for minimizing adverse effects on, or providing protection for  
11      and enhancing, other National Forest System resources.

## 12 **Royal Gorge Resource Area RMP (Arkansas River Eco-Subregion 1)**

### 13 Objective Decisions

14 Existing VRM classes will be utilized to guide resource management actions on BLM-  
15 administered lands. Adherence to criteria will occur according to respective class rating.

### 16 Allocation Decisions

- 17       • VRM Class II areas will be protected by Controlled Surface Use stipulations.
- 18       • VRM Class II areas within ACECs will be:
  - 19           ○ Closed to mineral entry
  - 20           ○ Closed to mineral materials disposal
  - 21           ○ Avoided by major ROW corridor development
  - 22           ○ Limited for OHV use to designated roads and trails
  - 23           ○ Retained in public ownership

### 24 Action Decisions

- 25       • Visual ratings in ACECs will be re-evaluated to ensure rating is appropriate to protect  
26       outstanding qualities of the area.

## 27 **PSICC LRMP**

28 Activities with the potential to adversely affect the scenic integrity are carefully designed to  
29 minimize potential scenery effects. The new Scenery Management System (SMS) will be  
30 implemented following Forest Plan Revision.

31 Direction in the Built Environment Image Guide (BEIG) is followed when new infrastructure is  
32 proposed on the PSICC. Guidance provided in the BEIG ensures that new buildings, signs, or  
33 other human-made features compliment natural and cultural settings.

1 **USFS Management Area 2B Prescription**

- 2 01 Design and implement management activities to provide a visually appealing  
3 landscape. Enhance or provide more viewing opportunities and increase vegetation  
4 diversity in selected areas.
- 5 a. Do not exceed an Adopted Visual Quality Objective (VQO) of Partial Retention  
6 b. Arterial and collector roads and trails are Sensitivity Level 1  
7 c. Manage visual resources using the above standards in accordance with FSM- 2380  
8 and FSH 2309-16 through FSH 2309- 25.

9 **USFS Management Area 4B Prescription**

- 10 01 Design and implement management activities to blend with the natural landscape.  
11 a. Do not exceed an Adopted Visual Quality Objective (VQO) of modification.

12 **USFS Management Area 4D Prescription**

- 13 01 Vary location of treated aspen clones to maintain natural-appearing diversity in age  
14 classes.  
15 a. Do not exceed an Adopted Visual Quality Objective (VQO) of modification.
- 16 02 Emphasize aspen viewing areas

17 **USFS Management Area 5B Prescription**

- 18 01 Design and implement management activities to blend with the natural landscape.  
19 a. Do not exceed an Adopted Visual Quality Objective (VQO) of modification

20 **USFS Management Area 6B Prescription**

- 21 01 Design and implement management activities to blend with the natural landscape.  
22 a. Do not exceed an Adopted Visual Quality Objective (VQO) of modification.  
23 b. When projects require clearing of vegetation and (or) soil disturbance, use irregular  
24 clearing edges and shapes to blend with the natural landscapes.

25 **2.1.15.6 Needs for Change and Management Opportunities**

26 Table 2-35 summarizes needs for change and management opportunities to consider in the  
27 BCNM MP-EIS.

28

**1 Table 2-35 Needs for Change and Management Opportunities for Visual Resources**

Needs for Change	Management Opportunities
The sensitivity of viewers, especially recreationists, has heightened following designation of BCNM. With that heightened sensitivity comes an expectation of viewing scenery in a natural-appearing condition within the BCNM.	Limit ground disturbing activities that may produce unnecessary visual contrast. Site or reroute trails along contours of landforms, where feasible, to reduce contrast in forms and lines.
Recreation on public lands (i.e., number and diversity of visitors) in Chaffee County has dramatically increased over recent years and the increase is expected to continue, further increasing sensitivity levels.	Limit the amount and density of visual impacts from cultural/ man-made infrastructure to existing disturbed areas associated with current recreation sites.
Current VRM and SIO designations established prior to monument designation may not align with ROVs, outstanding recreation opportunities and public sensitivity.	Evaluate as part of alternatives development current BLM VRM Class II and III acres for potential re-classification. Re-evaluate current VRM Class II classification assigned to Browns Canyon WSA for re-classification to VRM Class I following current BLM guidance. Evaluate as part of alternatives development current USFS VQOs for potential re-classification. Evaluate alignment of scenic resource management within BCNM between BLM and FS management.
Human development visible from BCNM may impact its scenic qualities.	Monitor and evaluate future projects on adjoining public lands that may influence visual quality when viewed from BCNM.

**2 2.1.16 Lands with Wilderness Characteristics**

3 Planning issues and management concerns based on Proclamation 9232 and additional agency  
4 concerns include:

- 5 • What BLM and USFS decisions are necessary to maintain solitude, quiet, other LWC  
6 values and where?

**7 2.1.16.1 Assessment Area**

8 The BCNM boundary is the assessment area for lands with wilderness characteristics.

**9 2.1.16.2 Best Available Scientific Information**

10 BLM. 2012. Manual 6310-Conducting Wilderness Characteristics Inventory on BLM Lands  
11 (Public). Release 6-129. March 15, 2012. Washington, DC: U.S. Department of the Interior,  
12 Bureau of Land Management.

13 BLM. 2012. Manual 6320—Considering Lands with Wilderness Characteristics in the BLM Land  
14 Use Planning Process. Release 6-130. March 15, 2012. Washington, DC: U.S. Department of  
15 the Interior, Bureau of Land Management.

16 BLM. 2013. COF-020-005 Railroad Gulch Wilderness Characteristics Inventory Form.

- 1 BLM. 2013. COF-020-044 Ruby Mountain Wilderness Characteristics Inventory Form.
- 2 BLM. 2013. COF-020-045 Arnold Gulch Wilderness Characteristics Inventory Form.
- 3 The Wilderness Act of 1964. Public Law 88-577 (16 U.S.C 1131-1136).

4 **GIS Data**

- 5 • BLM Lands with Wilderness Characteristics Inventory.
- 6 BLM\_RGFO\_LWC\_Inventory\_20160404. Accessed: 2017

7 As shown in Table 2-36, there are portions of three lands with wilderness characteristics inventory  
 8 units in the BCNM. However, the Arnold Gulch unit does not meet the criteria outlined in BLM  
 9 Manual 6310 due to the fact that it is not over 5,000 acres in size or contiguous with a wilderness  
 10 area. As a result, only the Railroad Gulch and Browns Canyon North, Ruby Mountain units  
 11 adjacent to the Browns WSA will be presented as a resource in the MP-EIS.

12 There is not a comparable “lands with wilderness characteristics” inventory unit on USFS lands.  
 13 Roadless areas are addressed in Section 2.3.

**Table 2-36 Lands with Wilderness Characteristics Inventory Units in the BCNM**

Identifier	Inventory Unit	Total Acres	Acres within BCNM	Adjacent to Wilderness Preserve	Wilderness Characteristics Present
COF-020-005	Railroad Gulch	2,448	537	Yes	Yes
COF-020-044	Browns Canyon North, Ruby Mountain	96	88	Yes	Yes
COF-020-045	Arnold Gulch	1,059	26	No	No
<b>Total</b>		<b>3,605</b>	<b>651</b>		

14 **2.1.16.3 Limitations/Data Gaps**

15 The 1996 RGRMP did not address lands with wilderness characteristics.

16 **2.1.16.4 Existing Conditions and Trends**

17 Lands with wilderness characteristics within and adjacent to the BCNM were delineated using  
 18 roads and property lines when possible. Each unit was then evaluated for wilderness  
 19 characteristics as defined in BLM Manual 6310 – Conducting Wilderness Characteristics  
 20 Inventory on BLM Lands. Minimum information standards for BLM to consider during the  
 21 wilderness characteristics inventory process include a map of sufficient detail to determine  
 22 specific boundaries, a detailed narrative that describes the wilderness characteristics of the area,  
 23 and photographic documentation.



1 The Railroad Gulch inventory unit (COF-020-005) is located near the southern boundary of the  
2 BCNM immediately east of and paralleling the Arkansas River for approximately 0.85 mile. The  
3 topography in the unit is rugged and varies in elevation from 7,400 feet near the Arkansas River  
4 to 8,200 feet near the eastern boundary (BLM 2013). The canyons, gulches, and lack of  
5 motorized routes within the unit offer outstanding opportunities for solitude and greatly diminish  
6 the chances of encountering other public land visitors (BLM 2013). While 537 acres of the  
7 Railroad Gulch unit lies within the BCNM, an additional 1,911 acres extend outside the  
8 boundary of the BCNM to the south. The Railroad Gulch unit is contiguous with the Browns  
9 Canyon WSA, making it eligible to be managed for wilderness characteristics.

10 The Browns Canyon North / Ruby Mountain inventory unit (COF-020-045) is located in the  
11 northwest corner of BCNM south of County Road 300. The unit is near the Arkansas Headwaters  
12 Recreation Area and is comprised of rocky canyons and pinnacles (BLM 2013). The topographic  
13 screening provided by this landscape, as well as piñon-juniper and ponderosa woodlands, allow  
14 for outstanding opportunities for solitude and unconfined recreation (BLM 2013). Eighty eight of  
15 the 96 acres (92 percent) lie within the BCNM boundary and the inventory unit is contiguous  
16 with the Browns Canyon WSA, which fulfills the requirement to be managed as lands with  
17 wilderness characteristics (BLM 2012).

#### 18 **2.1.16.5 Existing Management Direction**

19 Guidance is contained within BLM Manual 6320 – Considering Lands with Wilderness  
20 Characteristics in the BLM Land Use Planning Process.

21 Lands with wilderness characteristics highlight experiences for users seeking solitude and  
22 primitive recreational opportunities. Non-motorized trails are often desired in order to provide  
23 access into lands managed for their wilderness characteristics.

24 Undeveloped natural lands provide numerous ecological benefits and managing the wilderness  
25 resource is part of BLM’s multiple use mission. Section 201 of the Federal Land Management  
26 Policy Act requires BLM to maintain on a continuing basis an inventory of all public lands and  
27 their resources, including wilderness characteristics. These characteristics include size,  
28 naturalness, solitude, and outstanding opportunities for primitive and unconfined recreation.

#### 29 **Royal Gorge Resource Area RMP**

30 Not addressed in 1996 RMP (BLM 1996).

#### 31 **2.1.16.6 Needs for Change and Management Opportunities**

32 Table 2-37 summarizes needs for change and management opportunities to consider in the  
33 BCNM MP-EIS.

#### 34 **Table 2-37 Needs for Change and Management Opportunities for Lands with Wilderness** 35 **Characteristics**

Needs for Change	Management Opportunities
The BLM RGRMP was prepared prior to directives regarding lands with wilderness characteristics.	<p>Opportunity exist to protect the lands within its boundary that have been inventoried for wilderness characteristics by managing them to maintain this character.</p> <p>The Railroad Gulch and Browns Canyon North, Ruby Mountain lands with wilderness characteristics inventory units present the opportunity to manage these areas for naturalness, solitude and primitive recreation opportunities.</p>
Conditions relating to wilderness characteristics change over time.	Inventory must be considered when the BLM is undertaking future land use planning.

1    **2.2        Resource Uses**

2    **2.2.1      Recreation (including SRMA)**

3    Recreation and public access in and around BCNM is one of the key resource values in BCNM.  
4    The BCNM provides recreation opportunities that range across the spectrum, from primitive  
5    backcountry uses to more structured opportunities, such as developed camping or commercial  
6    rafting along the Arkansas River. Visitors enjoy the full range of recreational activities, including  
7    hiking, backpacking, hunting, fishing, horseback riding and packing, snowshoeing, off-highway  
8    vehicle use, camping and picnicking, gold panning, viewing scenery and wildlife, mountain  
9    biking, mountaineering, whitewater rafting, bouldering, and rock climbing. Relatively  
10    undeveloped areas, upland of the river corridor, provide opportunities for people to experience  
11    solitude and adventure in a natural environment. The Arkansas River is one of the nation’s most  
12    popular locations for whitewater boating and one of the most commercially rafted rivers in the  
13    United States (CPW and BLM 2017). The river also offers a world-class trout fishery as part of a  
14    designated 102-mile stretch of Gold Medal Waters. The river has also been evaluated as suitable  
15    for designation as a Recreational Wild and Scenic River (discussed further in Special  
16    Designations section).

17    ROVs for recreation in the BCNM are as follows:

- 18        • The “upper Arkansas River valley... an important resource for recreational anglers and  
19        boaters, and area ranchers and farmers.”
- 20        • “Some of Colorado's most emblematic animal species call Browns Canyon home... and  
21        attract hunters and wildlife viewers.”
- 22        • “A stunning diversity of other bird species, including the cliff swallow, Canada jay,  
23        mourning dove, flicker, blue jay, wild turkey, great horned owl, western screech owl, and  
24        saw whet owl, attract ornithologists and bird enthusiasts alike to these remote hills.”
- 25        • “The area also provides world class river rafting and outdoor recreation opportunities,  
26        including hunting, fishing, hiking, camping, mountain biking, and horseback riding.”

1 Planning issues and management concerns based on Proclamation 9232 and additional agency  
2 concerns include:

- 3 • What recreational activities, experiences, and benefits should be the focus of recreation  
4 management in the monument?
- 5 • How will recreational services and facilities, including the trail system, anticipate and  
6 proactively prepare for future urban expansion?
- 7 • What visitor services (e.g., facilities and development) are necessary to provide for an  
8 optimal recreational experience while also protecting the resources and the more  
9 primitive nature of the monument?
- 10 • What management should be placed on future special recreation permits to best support  
11 the recreation objectives and ensure protection of the purposes for which the area was  
12 designated?
- 13 • What management should apply to casual recreational use to best support the recreation  
14 objectives and ensure protection of the purposes for which the area was designated?
- 15 • What opportunities could be created for the monument trails system to connect with the  
16 riverfront trail system joining the cities of Buena Vista and Salida?

#### 17 **2.2.1.1 Assessment Area**

18 The assessment area is the BCNM boundary, which itself is defined largely by recreation  
19 features. Much of the eastern boundary of the BCNM is defined by a rugged high clearance road  
20 (National Forest System Road 185) known as Aspen Ridge. The northern boundary follows  
21 National Forest System Trail 1434. The western boundary generally follows the extent of BLM  
22 land and the Arkansas River. The southern boundary follows Railroad Gulch, National Forest  
23 System Road 184, and other natural features.

#### 24 **2.2.1.2 Best Available Scientific Information**

##### 25 **Reports and Studies**

26 BLM. 2005. Land Use Planning Handbook. H-1601-1. March 11, 2005. 163 pp.

27 BLM. 2014. BLM Recreation Permit and Fee Administration Handbook. H-2930-1. November  
28 17, 2014. 247 pp.

29 BLM. 2015. Analysis of the Management Situation for the Eastern Colorado Resource  
30 Management Plan. June 2015.

31 BLM. 2018. BCNM Socioeconomic and Environmental Justice Baseline Assessment. In-progress,  
32 February 2018.

- 1 Bowker, J.M., A.E. Askew, H.K. Cordell, C.J. Betz, S.J. Zarnoch, L. Seymour. 2012. Outdoor  
2 Recreation Participation in the United States—Projections to 2060: A Technical Document  
3 Supporting the Forest Service 2010 RPA Assessment. General Technical Report SRS-160.  
4 Asheville, NC: U.S. Department of Agriculture Forest Service, Southern Research Station.
- 5 Casey, T., Gollob, J., Parry, B. 2015. Colorado Mesa University, Bureau of Land Management -  
6 Royal Gorge Field Office Recreation Planning Report 2015. Colorado Mesa University.  
7 Retrieved from [https://eplanning.blm.gov/epl-front-](https://eplanning.blm.gov/epl-front-office/projects/lup/39877/73287/80487/RGFO_Recreation_Planning_Report_2015.pdf)  
8 [office/projects/lup/39877/73287/80487/RGFO Recreation Planning Report 2015.pdf](https://eplanning.blm.gov/epl-front-office/projects/lup/39877/73287/80487/RGFO_Recreation_Planning_Report_2015.pdf)
- 9 Clement, J.M. and A.S. Cheng. 2008. Using Analysis of Public Value Orientations, Attitudes, and  
10 Preferences to Inform National Planning in Colorado and Wyoming.
- 11 Colorado Off-Highway Vehicle Coalition (COHVO). 2016. Economic Contribution of Off-  
12 Highway Vehicle Recreation in Colorado Executive Summary. December 2016.
- 13 Consensus Building Institute (CBI), USFS, University of Colorado at Colorado Springs (UCCS).  
14 2017. Social Landscape Assessment of BCNM. August 2017.
- 15 Cordell, H.K., C.J. Betz, G.T. Green, and B. Stephens. 2008. Off-Highway Vehicle Recreation in  
16 the United States and its Regions and States: A National Report from the National Survey on  
17 Recreation and the Environment (NSRE). February, 2008. A RECSTATS Research Report in  
18 th IRIS Series. 107 pp.
- 19 Corona Research, Inc. 2009. Colorado State Parks Marketing Assessment: Visitor Intercept  
20 Survey Report.
- 21 CPW. 1990 – 2015. Arkansas Headwaters Recreation Area Visitation Details. Available online at:  
22 [http://cpw.state.co.us/placestogo/parks/ArkansasHeadwatersRecreationArea/Documents/Visi-](http://cpw.state.co.us/placestogo/parks/ArkansasHeadwatersRecreationArea/Documents/VisitationDetail1990-2015.pdf)  
23 [tationDetail1990-2015.pdf](http://cpw.state.co.us/placestogo/parks/ArkansasHeadwatersRecreationArea/Documents/VisitationDetail1990-2015.pdf).
- 24 CPW. 2000. Arkansas Headwaters Recreation Area Water Needs Assessment. Available online  
25 at:  
26 [http://cpw.state.co.us/placestogo/parks/ArkansasHeadwatersRecreationArea/Pages/publication](http://cpw.state.co.us/placestogo/parks/ArkansasHeadwatersRecreationArea/Pages/publications.aspx)  
27 [s.aspx](http://cpw.state.co.us/placestogo/parks/ArkansasHeadwatersRecreationArea/Pages/publications.aspx).
- 28 CPW. 2001. Arkansas Headwaters Recreation Area Management Plan. Available online at:  
29 [http://cpw.state.co.us/placestogo/parks/ArkansasHeadwatersRecreationArea/Pages/publication](http://cpw.state.co.us/placestogo/parks/ArkansasHeadwatersRecreationArea/Pages/publications.aspx)  
30 [s.aspx](http://cpw.state.co.us/placestogo/parks/ArkansasHeadwatersRecreationArea/Pages/publications.aspx).
- 31 CPW. 2001. Visitor Characteristics, Perceptions of Crowding and Conflict, and Management  
32 Preferences at the Arkansas Headwaters Recreation Area, Summer 2001. Available online at:  
33 [http://cpw.state.co.us/placestogo/parks/ArkansasHeadwatersRecreationArea/Documents/Arka-](http://cpw.state.co.us/placestogo/parks/ArkansasHeadwatersRecreationArea/Documents/ArkansasHeadwatersVisitorSurvey.pdf)  
34 [nsasHeadwatersVisitorSurvey.pdf](http://cpw.state.co.us/placestogo/parks/ArkansasHeadwatersRecreationArea/Documents/ArkansasHeadwatersVisitorSurvey.pdf).
- 35 CPW. 2014. Statewide Comprehensive Outdoor Recreation Plan and Appendices (SCORP) 2014  
36 – 2018. January. Available online at: <http://cpw.state.co.us/aboutus/Pages/SCORP.aspx>.

1 CPW. 2016. Fact Sheet. Available online at:  
 2 <http://cpw.state.co.us/placestogo/parks/ArkansasHeadwatersRecreationArea/Documents/FactSheet.pdf>.  
 3  
 4 CPW. 2016. Arkansas Headwaters Recreation Area (AHRA) Annual Report. Available online at:  
 5 <http://cpw.state.co.us/placestogo/parks/ArkansasHeadwatersRecreationArea/Documents/Annual-Reports/AnnualReport2016.pdf>.  
 6  
 7 CPW. 2017. Arkansas Headwaters Recreation Area Draft Management Plan / Environmental  
 8 Assessment. Available online at:  
 9 <http://cpw.state.co.us/placestogo/parks/ArkansasHeadwatersRecreationArea/Pages/AHRA-Plan-Revision.aspx>  
 10  
 11 International Mountain Society. 2010. Assessment and Monitoring of Recreation Impacts and  
 12 Resource Conditions on Mountain Summits: Examples from the Northern Forest, USA.  
 13 Available online at: <http://www.jstor.org/stable/mounresedeve.30.4.332>.  
 14 Lara, B. 2017. Salida Ranger District Recreation Staff, USFS. Draft Resource Specialist  
 15 Assessment Report.  
 16 Outdoor Foundation. 2017. Outdoor Participation Report 2017. Available online at:  
 17 [https://outdoorindustry.org/wp-content/uploads/2017/05/2017-Outdoor-Recreation-Participation-Report\\_FINAL.pdf](https://outdoorindustry.org/wp-content/uploads/2017/05/2017-Outdoor-Recreation-Participation-Report_FINAL.pdf). Accessed December 2, 2017.  
 18  
 19 Outdoor Industry Association. 2017. Recreation Economy Impacts State Report for Colorado.  
 20 Available at: <https://outdoorindustry.org/state/colorado/>. Accessed November 29, 2017.  
 21 USFS. 1982. Recreation Opportunity Spectrum Users Guide. Available online at:  
 22 [https://www.fs.fed.us/cdt/carrying\\_capacity/rosguide\\_1982.pdf](https://www.fs.fed.us/cdt/carrying_capacity/rosguide_1982.pdf).  
 23 Western Governors’ Association. 2012. 2012 Annual Report. WGA Annual Meeting – Cle Elum,  
 24 Washington. June 9 – 12, 2012.

25 **Visitor Count Data**

26 Visitation data that can be used to prepare baseline estimates and projections are found in Table  
 27 2-38.

28 **Table 2-38 Available Visitation Data**

Title	Source	Years Addressed	Location/Scale
<b>All Types of Recreation</b>			
RMIS Estimates	BLM, Kalem Lenard	2010-2017	Ruby Mountain Campground, Ruby Mountain TH, Hecla Junction

**ECOSYSTEMS, RESOURCES, CONDITIONS, AND TRENDS**

BCNM Usage 2017 (Dispensers)	AHRA, John Kreski	2017	(Ruby, Hecla and Browns Canyon)
TRAFx Counter Data	USFS, Ben Lara	2015	NFSR 184 (Turret Road)
TRAFx Counter Data	BLM, Cora Whisenhunt	August 2015-Jan 2017	Ruby Mountain Trailhead
TRAFx Counter Data	BLM, Kalem Lenard	2010-2017	CR 375, near Buena Vista
Vehicle Counters	CPW, Glenn Cottone AHRA	1999-2017	Ruby Mountain Campground, Hecla Junction
<b>Non-Motorized</b>			
TRAFx Counter Data	USFS, Ben Lara	2016	NFST 1435
<b>Special Events and Festivals</b>			
NFS Recreation Events – BCNM and Adjacent Lands (SalidaRD_rec_SUPS_Browns Canyon National Monument.xls)	USFS, Thomas Skaja	2017	BCNM and Adjacent NF Lands
Special Activity Agreements (SAA)	AHRA, John Kreski	2017	Buena Vista to Salida
<b>Boating (Commercial and Private)</b>			
75% of Capacity Report	AHRA, John Kreski	2017	BCNM
Average Weekday Day Use	AHRA, John Kreski	2017	BCNM
Average Weekend Day Use.	AHRA, John Kreski	2017	BCNM
Season Summary by Company	AHRA, John Kreski	2017	BCNM
Season Summary by Section	AHRA, John Kreski	2017	BCNM
Section User Report.	AHRA, John Kreski	2017	BCNM
2017 Total Commercial Use	AHRA, John Kreski	207-2017	BCNM
Private Boater Count All	AHRA, John Kreski	2011-2017	BCNM
ARKWELCO-Historic Record Comparison	AHRA, John Kreski	1962-2013	BCNM
<b>Camping</b>			
Browns Canyon Camping Site Data	AHRA, John Kreski	2004-2006, 2016-2017	BCNM
<b>Fishing</b>			

Browns Canyon Walk Wade Fishing Data	AHRA, John Kreski	2009-2016	BCNM
Browns Canyon Float Fishing Outfitters Use Data	AHRA, John Kreski	2011-2016	BCNM
<b>Special Use Permits and Outfitters</b>			
SUPs in BCNM and Adjacent Lands (SalidaRD_rec_SUP'S_Browns Canyon National Monument.xls)	USFS, Thomas Skaja	2017	BCNM and Adjacent NF Lands
Permit Applications on Hold – BCNM and Adjacent Lands (SalidaRD_rec_SUP'S_Browns Canyon National Monument.xls)	USFS, Thomas Skaja	2016 - 2017	BCNM and Adjacent NF Lands
<b>Other Visitation Data</b>			
Ad hoc estimate of visitors of Salida RD			Salida RD

- 1
- 2 Other recreation data includes:
- 3 CPW. nd. Impact Analysis All Sites 1997-2001. John Kreski.
- 4 Estimated Number of Lake Anglers, Stream Anglers, and Related Expenditures on BLM-
- 5 Managed Lands, Fiscal Year 2000. Available online at:
- 6 [https://www.blm.gov/public\\_land\\_statistics/pls00/pdf/part4-4.pdf](https://www.blm.gov/public_land_statistics/pls00/pdf/part4-4.pdf)
- 7 Estimated Recreational Use of Public Lands Administered by the BLM, Fiscal Year 2006.
- 8 Available online at:
- 9 [https://www.blm.gov/style/medialib/blm/wo/Business\\_and\\_Fiscal\\_Resources/2006\\_pls.Par.88](https://www.blm.gov/style/medialib/blm/wo/Business_and_Fiscal_Resources/2006_pls.Par.88659.File.dat/Part_4.pdf)
- 10 [659.File.dat/Part\\_4.pdf](https://www.blm.gov/style/medialib/blm/wo/Business_and_Fiscal_Resources/2006_pls.Par.88659.File.dat/Part_4.pdf)
- 11 Public Land Statistics. 1996-2015. Available online at:
- 12 [https://www.blm.gov/public\\_land\\_statistics/](https://www.blm.gov/public_land_statistics/)
- 13 Public Land Statistics. 2015. Available online at:
- 14 [https://www.blm.gov/public\\_land\\_statistics/pls15/pls2015.pdf](https://www.blm.gov/public_land_statistics/pls15/pls2015.pdf)
- 15 USFS. 2016. PSICC National Visitor Use Monitoring February 2016.

16 **GIS Data**

- 17 • BLM Field Office Boundaries, BLM\_RGFO\_Field\_Office\_Boundary\_20170725.
- 18 Accessed: 2017.
- 19 • BLM Human Ecoregions, ECRMP\_HumanEcoregions\_AltD\_20170725. Accessed: 2017.
- 20 • BLM Recreation Sites, BLM\_RGFO\_RecPoints\_20170802. Accessed: 2017.
- 21 • BLM Recreation Areas, BLM\_RGFO\_RecPolys\_20170802. Accessed: 2017.
- 22 • BLM Alternative C. Alternative\_C\_Preferred\_Alt\_Copied\_20160708. Accessed: 2017.

- 1 • BLM National Historic Trails: BLM\_CO\_NLCS\_Natl\_ScenicAndHistoric\_Trails.  
2 Accessed: 2017.
- 3 • BLM GTLF Routes, BLM\_RGFO\_GTLF\_20170802. Accessed: 2017.
- 4 • BLM Trails, BrownsCanyonTrails\_041417. Accessed: 2017.
- 5 • BLM ROS. RecreationOpportSpectrum. Accessed: 2017.
- 6 • USFS Trails, PSICC\_MVUM\_TRAILS20170130. Accessed: 2017.
- 7 • USFS Roads. PSICC\_MVUM\_ROADS20170130. Accessed: 2017.
- 8 • USFS Management Areas. PSI\_MgtAreasFP1984\_Amended. Accessed: 2017.
- 9 • BLM Lands with Wilderness Characteristics. BLM\_RGFO\_LWC\_Inventory\_20160404.  
10 Accessed: 2017.
- 11 • BLM Wilderness Study Areas. BLM\_RGFO\_WSA\_20170725. Accessed: 2017.
- 12 • USFS Colorado Roadless Areas. RoadlessArea\_CO\_2012. Accessed: 2017.
- 13 • BLM Areas of Critical Environmental Concern. BLM\_RGFO\_ACEC\_20170725.  
14 Accessed: 2017.
- 15 • USFS Boundary. AHRA2015CMABoundary032016. Accessed: 2017.
- 16 • BLM Wild and Scenic Rivers. BLM\_CO\_WildAndScenicRivers\_20170802. Accessed:  
17 2017.

### 18 **2.2.1.3 Limitations/Data Gaps**

19 The best available data for recreation activities and use levels is found in Table 2-38. Several  
20 uses, including hiking, climbing, horseback riding, mineral and gem collecting, and OHV use, is  
21 known to occur within the BCNM but use levels and other specifics are unknown outside of the  
22 above sources. While some trail counters have been in place, a comprehensive analysis of visitor  
23 use has not been completed and use data is limited. Therefore, it is difficult to calculate total  
24 visitation numbers to the BCNM and predict future use levels.

25 The AHRA portion of BCNM has good information on visitation by river activity and  
26 commercial vs. private boating. Visitor access points are limited on USFS lands and use levels  
27 are mostly undocumented. A traffic counter has been in place at the Ruby Mountain Trailhead  
28 since August 2015 and provides an accurate count of visitors entering BCNM through that portal  
29 and the time/date. A road counter was placed on the National Forest System Road (NFSR) 184 in  
30 2015 and a trail counter was placed on the National Forest System Trail (NFST) 1435 for 2015-  
31 2016 as well. Number counts for the NFST 1435 were very low, which led to a decision to move  
32 it to a different location in 2017.

33 In summary, non-river visitor use and recreation access data is limited. In the absence of a  
34 comprehensive visitor use survey specific to BCNM, higher level data, including population  
35 forecasts, general recreation trends for Colorado and the nation, along with resource specialist



1 knowledge, will be used to estimate additional use trends in the BCNM Socioeconomic and  
2 Environmental Justice Baseline Assessment. Given the regional draw of the BCNM, county and  
3 statewide population projections and use level data may be used to project future use trends.

#### 4 **2.2.1.4 Existing Conditions and Trends**

5 Existing conditions for recreation use are:

- 6 • The recreation opportunity spectrum (ROS) is used by BLM, USFS, and CPW to provide  
7 a conceptual framework for inventory, planning, and management of recreational  
8 resources and settings. ROS is used to characterize and zone recreation opportunities in  
9 terms of setting, activity, and experience. The river corridor ROS is Physical–  
10 Backcountry, Social–Front Country, and Operational–Front Country (CPW 2017). ROS  
11 designations on BLM outside of the river corridor are roaded natural, semi-primitive  
12 motorized, and semi-primitive non-motorized. ROS designations on USFS lands are  
13 semi-primitive motorized and roaded natural. Figure 2-14 shows the various recreation  
14 features and management direction.
- 15 • The highest levels of use occur along the Arkansas River. Developed recreational  
16 infrastructure is concentrated at Ruby Mountain Campground (the northwestern corner of  
17 BCNM) and Hecla Junction (south center of BCNM), both along the Arkansas River.
- 18 • The AHRA-MP divides the Arkansas River into segments/sections for the purpose of  
19 monitoring recreational outcomes and capacities. Segment 2 includes river sections from  
20 Buena Vista Whitewater Park to Salida East. Segment 2 is the most heavily used portion  
21 of the river for commercial rafting trips and offers Class III and IV rapids and a vertical  
22 drop of 30 feet per mile. Other activities include fishing, a considerable amount of private  
23 kayaking and rafting, overnight camping trips, hiking, picnicking, wildlife watching and  
24 recreational gold placering. The recreation sites that serve this segment are described  
25 below and include Fisherman’s Bridge above BCNM; Ruby Mountain and Hecla  
26 Junction within BCNM; and Stone Bridge, Big Bend, Slaughterhouse, and the Salida  
27 Whitewater Park below BCNM (CPW 2017).
  - 28 ○ Fisherman’s Bridge Recreation Site: This site is managed by AHRA as a BLM  
29 lease site. Fisherman’s Bridge is one of the busiest put-ins for commercial  
30 boating. A large parking area, parking barriers, vault toilets, information signs, a  
31 watchable wildlife kiosk, and two boat slides exist. A daily or annual pass is  
32 required at this site (CPW 2017).
  - 33 ○ Ruby Mountain Recreation Site: This site is managed by AHRA as a BLM lease  
34 site. Day use and camping facilities such as parking, restrooms, picnic sites, grills,  
35 tent pads, a small amphitheater, information signs and a boat launch exist.  
36 Restrooms and fee stations have solar lights. This site is primarily used by private  
37 boaters, anglers, and campers and contains 22 sites. The AHRA managers may  
38 allow commercial boaters to use this site as a put-in when flows fall below 700

1 cfs. This site also provides non-mechanized access into the Browns Canyon  
2 WSA. This campground was renovated in 2015. A daily or annual pass is required  
3 at this site (CPW 2017).

4 ○ Hecla Junction Recreation Site: This site is managed by AHRA as a BLM lease  
5 site. Day use and camping facilities such as parking, restrooms, picnic sites, grills,  
6 tent pads, information signs, and a boat launch exist. Restrooms and fee stations  
7 have solar lights. A USGS water gauge is located here. The site is primarily used  
8 by boaters, anglers, and campers. A daily or annual pass is required at this site  
9 (CPW 2017).

10 ○ Stone Bridge Recreation Site: This site is managed by AHRA as a BLM lease  
11 site. Parking, restrooms, picnic tables, a boat launch, and information signs exist.  
12 The site is primarily used by boaters, although anglers also use the site. A daily or  
13 annual pass is required at this site (CPW 2017).

14 ● The BLM uses the Recreation Management Information System (RMIS) to track and  
15 report recreation visitation. The system enables BLM employees to estimate recreation  
16 participation in 65 types of recreation activities. Numbers are recorded at BLM sites and  
17 areas, based on registrations, permit records, observations, and professional judgment.  
18 Visitation is estimated by number of participants as well as visitor days. Participants are  
19 defined as the actual number of people who take part in a recreational activity. A visitor  
20 day is a recreation unit of measure commonly used by Federal agencies, and represents  
21 an aggregate of 12 visitor hours at a site or area. RMIS data is available for Hecla  
22 Junction, Ruby Mountain, and Ruby Mountain Trailhead.

23 ● RMIS visitation estimates are limited to sites; therefore, dispersed recreation is not  
24 counted. Direct monitoring by BLM staff must focus on areas of greatest use or conflicts,  
25 with the result that more remote locations within the planning area may not receive  
26 adequate monitoring. In addition, many popular trails and use areas are not designated,  
27 making it difficult to accurately determine the amount of recreational use these areas  
28 receive. Therefore, the numbers recorded for specific activities in specific areas may not  
29 accurately reflect the actual level of use. Other use data, e.g. changes in use patterns  
30 (such as a change in numbers or types of non-local users) are difficult to estimate. The  
31 USFS uses National Visitor Use Monitoring to track and report visitation. Table 2-39  
32 summarizes annual visitation estimates for the Pike-San Isabel Forest of PSICC.  
33 Visitation is only available at the forest level.

34

**Table 2-39 Annual Visitation Estimate for Pike-San Isabel Forest**

Visit Type	Visits (1,000s)	90% Confidence Level (%)#
Total Estimated Site Visits*	5,596	±17.0
→ Day Use Developed Site Visits	1,026	±19.3
→ Overnight Use Developed Site Visits	198	±22.8
→ General Forest Area Visits	4,074	±22.7
→ Designated Wilderness Visits†	297	±33.2
Total Estimated National Forest Visits‡	4,434	±17.8
→ Special Events and Organized Camp Use‡	0	±0.0

Source: USFS 2016

\* A Site Visit is the entry of one person onto a National Forest site or area to participate in recreation activities for an unspecified period of time.

† Designated Wilderness visits are included in the Site Visits estimate.

‡ Special events and organizational camp use are not included in the Site Visit estimate, only in the National Forest Visits estimate. Forests reported the total number of participants and observers so this number is not estimated; it is treated as 100% accurate.

§ A National Forest Visit is defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A National Forest Visit can be composed of multiple Site Visit .

# This value defines the upper and lower bounds of the visitation estimate at the 90% confidence level, for example if the visitation estimate is 100 +/-5%, one would say “at the 90% confidence level visitation is between 95 and 105 visits.”

- Because of its natural beauty, biological productivity, steep gradient, and diversity of river environments, the Arkansas River is a destination for recreationists (Table 2-40).
- BCNM visitation is dynamic because of multiple factors including the Colorado economy, surrounding states’ economies, gas prices, the weather from winter snowpack and summer rain events, and the availability of multiple and competitive recreation activities around the state of Colorado. Arkansas River commercial and private boat use is influenced by these dynamic factors.
- According to the AHRA Annual report, commercial and private boating use in the overall area increased 11.7 percent and 8.7 percent respectively between 2015 to 2016 (CPW 2016). According to AHRA’s use trends, 2015 was one of the highest visitation years since they started tracking visitation numbers—accounting for more than 800,000 total visitors to the four county AHRA. However, the section of the river through BCNM (Segment 2b, Fisherman’s Bridge to Stone Bridge), saw 115,354 commercial boaters (paying clients) in 2016, a decrease of 22 percent from 2001 (CPW and BLM 2017). The above-noted factors have kept both commercial and private boat numbers relatively constant for the past ten years.

**1 Table 2-40 AHRA Recreation Use Summary**

<b>Activity</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Sightseeing	282,472	217,648	286,598	283,669	273,664	252,132	256,577	235,221
Private Shore Fishing	70,011	59,377	73,975	68,570	72,939	69,390	71,206	67,053
Private Boating	30,669	23,912	31,816	28,691	30,127	29,385	30,118	27,488
Private Boat Fishing	7,089	5,446	7,441	6,895	6,897	7,241	10,615	10,211
Commercial Shore Fishing	1,372	1,749	2,143	3,056	3,158	2,995	2,858	2,351
Commercial Boating (not including float fishing)*	312,784	169,557	254,808	242,090	269,004	280,180	293,038	263,805
Commercial Boat Fishing	-	607	980	1,772	2,176	2,201	2,134	1,617
Picnicking	44,826	33,324	47,293	42,740	45,660	42,173	43,879	41,909
Other (Mineral, Visitor Center, Hunting, Swimming)	-	-	-	-	-	29,131	44,839	29,008
Trail	21,646	16,742	22,065	20,715	24,445	22,898	23,980	22,640
Interpretive	12,753	20,986	29,129	29,029	13,428	9,829	10,111	7,803
Camping	24,189	14,936	23,141	17,429	19,692	28,537	35,183	30,058
<b>Total</b>	<b>807,811</b>	<b>564,284</b>	<b>779,389</b>	<b>744,656</b>	<b>761,190</b>	<b>776,092</b>	<b>824,538</b>	<b>739,164</b>

2 \* Actual number, includes guides, trainees and clients

3 Source: CPW 2016

4

1 **Table 2-40 AHRA Recreation Use Summary (Continued)**

2

<b>Activity</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>
Sightseeing	259,169	254,737	263,907	218,515	248,575	289,958	297,207	303,151
Private Shore Fishing	68,191	60,403	69,316	64,814	68,060	75,157	82,720	82,518
Private Boating	25,433	24,162	21,967	18,075	19,588	22,280	22,867	24,849
Private Boat Fishing	11,661	7,584	8,109	5,857	5,090	5,189	5,337	5,477
Commercial Shore Fishing	2,040	2,339	2,495	2,631	3,400	3,290	3,410	3,394
Commercial Boating (not including float fishing)*	252,564	260,063	248,429	211,934	222,303	237,023	247,274	276,454
Commercial Boat Fishing	1,867	2,059	1,906	2,048	2,297	2,771	2,347	2,344
Picnicking	42,520	40,871	41,613	35,107	37,093	42,877	43,949	47,532
Other (Mineral, Visitor Center, Hunting, Swimming)	31,880	31,625	35,142	38,183	42,445	38,715	39,683	37,727
Trail	23,424	25,569	25,520	19,446	20,094	23,743	24,336	25,837
Interpretive	7,868	8,461	14,447	13,903	15,577	16,121	16,524	19,483
Camping	33,682	35,279	38,265	37,206	36,669	40,876	49,766	59,944
<b>Total</b>	<b>760,299</b>	<b>753,152</b>	<b>771,116</b>	<b>667,719</b>	<b>721,191</b>	<b>798,000</b>	<b>835,420</b>	<b>888,710</b>

3 \* Actual number, includes guides, trainees and clients

4 Source: CPW 2016

- 5
- 6 • AHRA had a total visitation of 276,454 commercial boating clients within the entire
  - 7 corridor, measured through commercial boating company seasonal reports as shown in
  - 8 Table 2-40. Of these total visitors, 115,354 commercial boating clients or 42 percent
  - 9 utilized Section 2b, Fisherman’s Bridge to Stone Bridge (Browns Canyon), as shown in
  - 10 Table 2-41. Applying an assumption of 42 percent to all AHRA recreation use, annual
  - 11 visitation within the BCNM AHRA corridor would amount to 373,258 visits in 2016.

1 **Table 2-41 Segment 2 Commercial Use**

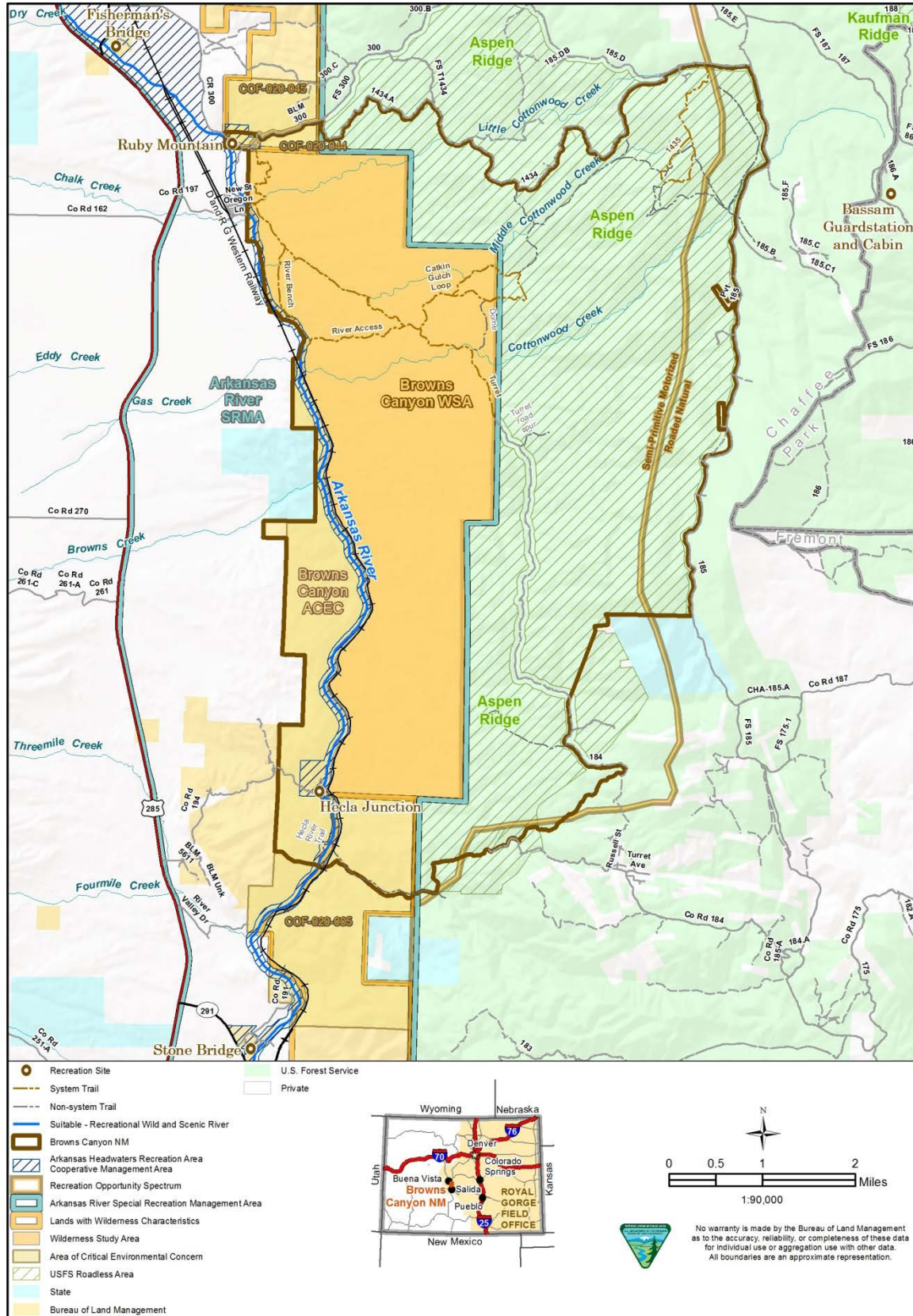
River Segment 2	*Commercial Use		% of Change
	2001	2016	
<b>2a: Buena Vista Whitewater Park to Fisherman’s Bridge</b>	22,483	12,423	-45%
<b>2b: Fisherman’s Bridge to Stone Bridge (incl. BCNM)</b>	147,380	115,354	-22%
<b>2c: Stone Bridge to Big Bend</b>	13,118	9,114	-31%
<b>2d: Big Bend to Salida East</b>	3,674	7,814	113%

2 \* Commercial Use = Clients + Staff

- 3
- 4
- 5 • Camping in AHRA has steadily increased between 2001 to 2016. Between 2015 and
  - 6 2016, camping increased over 20 percent (CPW 2016).
  - 7 • BLM, USFS, and AHRA issue commercial SRPs are issued to outfitters, guides, vendors,
  - 8 recreation clubs, and commercial competitive event organizers that provide recreational
  - 9 opportunities or services. Special recreation permits (SRPs) within BCNM are issued for
  - 10 commercial, competitive, vending, as well as organized clubs and group activities and
  - 11 events from backpacking, hunting, rock climbing, horseback riding, and OHV tours.
  - 12 Permits are also issued for events such as marathons, mountain biking races, and OHV
  - 13 touring. In general, SRPs may be issued for 10 years or less, with annual renewals. The
  - 14 permits are issued to manage visitor use, protect natural and cultural resources, and
  - accommodate commercial recreational uses. SRPs within BCNM are shown in Table
  - 2-42.

15 **Table 2-42 SRPs within or Adjacent to BCNM**

Types of SRPs	Salida RD	BLM	AHRA
Outfitter and Guides Permitted in 2017	20 on BCNM or adjacent NF lands (source: Salida RD 2017)	3 Hunting Outfitters (RGFO 2017)	Fifty Eight (58) Special Use Agreements which include One Hundred and Two (102) activities that these 58 contractors conduct.
Recreation Events in 2017	21	0	56



1  
2 **Figure 2-14 Recreation, Travel and Transportation Resources**

1 Trends for recreation use are as follows:

- 2 • Outdoor recreation on public lands is at an all-time high. Participation rates and values  
3 placed on outdoor recreation seem to be increasing on a national, state, and local level. In  
4 2016 almost half, (48.8 percent) of all Americans participated in some type of outdoor  
5 recreation activity (Outdoor Foundation 2017). This equates to 144.4 million Americans,  
6 who went on a collective 11 billion outdoor outings. Within the State of Colorado, 90  
7 percent of Colorado residents that completed a 2013 survey indicated they had  
8 participated in a recreation activity in Colorado (CPW 2014).
- 9 • Tourism is the second largest industry in Colorado and a considerable portion of  
10 Colorado's tourism economy is reliant on outdoor recreation resources and public lands  
11 (Western Governors' Association 2012). In Colorado, outdoor recreation generates \$28  
12 billion in consumer spending annually and creates 229,000 direct jobs, which translates  
13 into \$2.0 billion in state and local tax revenues. Colorado residents are more likely to  
14 participate in day hiking and camping than the average American (OIA 2017).
- 15 • According to research completed by Clement and Cheng (2008), the second highest value  
16 placed on USFS lands is recreation. Many people rely on and have come to expect  
17 Colorado to provide a diversity of experiences and opportunities. Others choose to reside  
18 near the BCNM because of the experiences and opportunities that are available.  
19 Regardless of where they are visiting from, these people provide important contributions  
20 to local communities, both as visitors and residents.
- 21 • The changing demographics of the nation are also affecting the types of recreational  
22 activities being pursued on public lands; for example young adults are delaying family  
23 formation, the number of children per household is decreasing, and older people are  
24 retiring at younger ages and have more disposable income. All of these trends are causing  
25 an increase in outdoor recreational demands on public lands.
- 26 • The Social Landscape Assessment of BCNM summarizes the public's perspectives on the  
27 social, economic, environmental, and resource conditions of BCNM. Participants  
28 highlighted the importance of a range of recreation opportunities based on the beauty and  
29 quality of the river for fishing and boating; a rugged yet accessible landscape; and scenic  
30 and primitive features. Browns Canyon offers meaning and importance for a variety of  
31 reasons; including scenic views, whitewater recreation, biological resources/wildlife, ease  
32 of access, learning opportunities, and economic impacts (CPW 2017). Overall, the public  
33 has a deep appreciation for the unique experiences BCNM offers such as rugged and  
34 remote terrain and solitude. There is an awareness that designation of BCNM comes with  
35 both positive and negative effects. With designation, improvements and funding may  
36 increase, but it may also increase visitation and the associated challenges in regulation  
37 and enforcement. An acknowledgement for collaborative management approach among  
38 agencies at all levels and user groups was recognized.



- 1 • The Social Landscape Assessment of BCNM further identified the following key themes.  
2 Additional information on the values of all BCNM stakeholders is summarized in Section  
3 3.7 of the Socioeconomic Baseline Report (CBI, USFS, UCCS 2017).
  - 4 ○ Desire to have adequate and ample facilities to manage high-density areas (e.g.,  
5 Hecla Junction, Ruby Mountain) and to accommodate a diverse range of uses, but  
6 to emphasize low-developed, ‘primitive’ sites to provide more dispersed or  
7 rugged experiences without facilities.
  - 8 ○ Desire to expand and improve trails and river facilities to accommodate a variety  
9 of recreation users (motorized, equestrian, mountain bikers, seniors, ADA), but  
10 also provide places in BCNM that are harder to reach, where solitude can be  
11 found.
  - 12 ○ Recognition of BCNM’s historic and cultural heritage resources and a desire for  
13 targeted management of these areas, including restoration and interpretation  
14 (mining, railroad).
  - 15 ○ Recognition of BCNM’s potential as a place for learning, discovery, and  
16 environmental education. The BCNM’S compact and accessible nature as well as  
17 the uniqueness and diversity of wildlife, geology, history, culture, and recreation  
18 opportunities make this area an ideal learning laboratory.
- 19 • New types of recreational activities that did not exist 10-15 years ago also are increasing  
20 on public land. World class whitewater opportunities have been growing within the  
21 BCNM in the form of standup paddleboarding (SUP), making the Arkansas River an  
22 internationally known destination for whitewater sports. “Over the past three years, stand  
23 up paddling was the top activity for growth, increasing participation an average of 26  
24 percent from 2012 to 2015. Kayak fishing, white water kayaking, and sea/tour kayaking  
25 also saw some of the biggest participation increases during that time.” (Outdoor  
26 Foundation 2017).

27 Drivers and stressors for recreation include:

- 28 • Recreation use trends in BCNM have been affected by the increasing human population  
29 in adjacent communities, close proximity to the Front Range areas where population has  
30 been increasing, increase in outside visitors to the Upper Arkansas Valley, and changes in  
31 technology related to recreational activities.
- 32 • Increased visitation and access may increase impacts on sensitive areas, including winter  
33 range and breeding areas for big game. Non-system social trails along the river result in  
34 habitat degradation and increased sedimentation. A proliferation of non-system trails near  
35 Ruby trailhead for gem hunting also increases sedimentation.
- 36 • Increases in motorized and non-motorized recreation, both private and commercial, lead  
37 to vegetation degradation, invasive species spread, erosion/sedimentation, and wildlife

1 disturbance. In addition, full size vehicle camping and full size recreational vehicles are  
2 increasing the extent of ground disturbance and expanding road widths.

- 3 • Hiking/camping in summer along Railroad Gulch may disturb peregrine falcon nesting as  
4 well as other resources, including cultural.

#### 5 **2.2.1.5 Existing Management Direction**

6 Table 1-2 lists relevant, existing Federal, state, and local management direction for recreation. In  
7 addition, BLM Management Objectives and Direction and USFS Management Prescriptions that  
8 are specific to recreation are presented below.

#### 9 **BLM Royal Gorge Resource Area RMP (Eco-Subregion 1, Arkansas River)**

10 The Arkansas River SRMA is characterized by the Arkansas River and its many drainages; steep  
11 rugged canyons; open expanses of irrigated pastures; high mountain peaks; and lush riparian zones.  
12 The SRMA encompasses all BLM land in the BCNM.

#### 13 **Objective Decisions**

- 14 • A variety of recreational opportunities will be provided and settings (from rural to semi-  
15 primitive non-motorized) will be maintained. Additional opportunities for mountain  
16 biking, hiking, OHV use, interpretation, and horseback riding, will be provided
- 17 • Facility development will reduce user conflict.
- 18 • Development will be provided to enhance visitor health and sanitation.

#### 19 **Allocation Decisions**

- 20 • Developed recreation sites will be managed as follows:
  - 21 ○ Excluded from livestock grazing
  - 22 ○ Leased for fluids with NSO stipulations
  - 23 ○ Closed to mineral entry
  - 24 ○ Closed to mineral material disposal
  - 25 ○ Avoided by major ROWs
  - 26 ○ Limited for OHV use to designated roads and trails

#### 27 **Action Decisions**

- 28 • Address river corridor and upland recreation opportunities with emphasis on balance  
29 between resource protection and tourism within IAPs.
- 30 • Coordinate activities with various volunteer and user groups.
- 31 • Provide monitoring and visitor contacts to ensure visitor safety, resource protection, and  
32 visitor information regarding availability of recreational opportunities.

- 1       • Acquisitions/easements to enhance water-based recreation, mountain biking, OHV use,  
2       hiking, horseback riding, hunting, and natural resource interpretation opportunities will  
3       be considered and pursued.

4   **PSICC FLMRP**

5   ROS Management Goals

6   The two ROS classes that fall within the BCNM project area include Semi-primitive Motorized  
7   and Roded Natural recreation.

- 8       • Management goals for Semi-primitive Motorized ROS class involve (USFS 1982):
- 9           ○ Providing some opportunity for isolation from man-made sights, sounds, and  
10          management controls in a predominantly unmodified environment.
- 11          ○ Providing for the opportunity to have a high degree of interaction with the natural  
12          environment, to have moderate challenge and risk and to use outdoor skills.
- 13          ○ Concentration of visitors is low, but evidence of other area users is present.
- 14          ○ On-site managerial controls are subtle.
- 15          ○ Facilities are provided for resource protection and the safety of users.
- 16          ○ Motorized use is permitted.
- 17          ○ Use by high clearance vehicles and motorized water travel is common. Road  
18          density is less than one mile per square mile. Off-road snowmobile travel on snow  
19          may occur.
- 20          ○ Visitor information facilities may be used to interpret cultural and natural  
21          resource features, but are not elaborate and harmonize with the setting.
- 22          ○ Facilities and structures generally do not exceed Development Scale II and are  
23          maintained to accommodate the types and levels of use anticipated for the site and  
24          area. Forest Service recreation cabins are fully compatible.
- 25          ○ User meets less than 10 parties per day (6 parties per day in wilderness) on trails,  
26          roads, and shorelines during 80 percent of the primary use season.
- 27          ○ Visitor-caused impacts may be noticeable, but not degrading to basic resource  
28          elements. Site hardening is very infrequent, but, when it occurs, is in harmony  
29          with, and appropriate for, the natural-appearing backcountry setting.
- 30       • Management goals for roded natural ROS class involve (USFS 1982):
- 31           ○ This setting consists of areas near improved and maintained roads.
- 32           ○ Mostly natural in appearance, some human modifications are evident, with  
33           moderate numbers of people, visible management controls, and developments.
- 34           ○ Activities include wood gathering, downhill skiing, fishing, off-highway vehicle  
35           driving, interpretive uses, picnicking, and vehicle camping.

- 1           ○ The experience provides for a sense of security through the moderate number of
- 2           visitors and developments, and some personal risk-taking and challenges.
- 3           ○ Automobile and road access would be acceptable in these areas.
- 4           ○ Access to and through the area is typically by passenger vehicle, although
- 5           motorized use may be restricted to provide for resource protection, user safety, or
- 6           to provide a diversity of recreation opportunity.
- 7           ○ Control facilities such as parking areas, barriers and signs harmonize with the
- 8           natural environment. Visitor information facilities are not elaborate or complex.
- 9           ○ Typical facilities include outdoor interpretive displays and rustic campgrounds
- 10          and picnic areas.
- 11          ○ Visitor-caused impacts are noticeable but are not degrading to basic resource
- 12          elements nor do they exceed established Visual Quality Objectives. Site
- 13          hardening may be dominant, but is in harmony with natural-appearing landscape
- 14          and appropriate for the site and setting.
- 15          ○ User meets less than 20 other parties per day on trails and in dispersed areas,
- 16          during at least 80 percent of the primary use season. User may meet numerous
- 17          other parties on roads and developed recreation sites.

18    Dispersed Recreation Management

- 19          01    Provide roaded natural or rural recreation opportunities along Forest arterial collector
- 20          and local roads which are open to public motorized travel. Manage recreation use to
- 21          provide moderate to high incidence of contact with other groups and individuals.
- 22          ○ Where arterial collector or local roads or areas are closed to public motorized
- 23          recreation travel provide for dispersed non-motorized recreation with a moderate
- 24          to high incidence of contact with other groups and individuals in a roaded natural
- 25          or rural setting.
- 26          a. Maximum use and capacity levels are:
- 27                i. Trail and camp encounters during peak use days may exceed 30 other parties
- 28                per day
- 29          b. Increase the above use levels where necessary to provide adequate access to areas
- 30          or natural features that afford special or unique recreation opportunities.
- 31          c. Reduce the above use level coefficients as necessary to reflect usable acres,
- 32          patterns of use, and general attractiveness of the specific management area type as
- 33          described in the ROS Users Guide, Chapter 25.
- 34          03    Reduce the above use levels where unacceptable changes to the biophysical resources
- 35          will occur.
- 36          d. Close local roads to public use. Designate routes and areas which can be
- 37          periodically opened to gathering firewood or operating oversnow vehicles.

- 1        01        Permit undesignated sites in Frissell condition class 1 through 3 where unrestricted  
2                    camping is permitted.
- 3        02        Manage site use and occupancy to maintain sites within Frissell condition class 3  
4                    except for designated sites which may be class 4. Close and restore class 5 sites.
- 5        03        Facilities provided include development level 1 and 2 campgrounds, trails suitable for  
6                    motorized trailbike use, local roads with primitive surface and parking lots at trail  
7                    heads. Provide signing compatible with intended use.
- 8                    a. Specify off-road vehicle restrictions based on ORV use management (FSM 2355,  
9                    R2 Supp 88)
- 10                    b. See FSM 2331, FSM 7732, FSH 7709 12 (Trails Handbook), FSH 7109 11a and  
11                    11b (Sign Handbook)
- 12        04        Prohibit motorized vehicle use off Forest System roads and trails (except  
13                    snowmobiles operating on snow) in other alpine, and other ecosystems, where needed  
14                    to protect soils, vegetation, or special wildlife habitat.
- 15        05        Close roads and trails to motorized travel when the surface would be damaged to the  
16                    degree that resulting runoff into adjacent water bodies would exceed sediment yield  
17                    threshold limits.
- 18                    a. Specify off-road vehicle restrictions based on ORV use management (FSM 2355,  
19                    R2 Supp 88).

20        Recreation Management (Private and Other Public Sector)

- 21        01        Encourage development of private sector recreation oriented support services.

22        **USFS Management Area 4B Prescription**

23        Dispersed Recreation Management

- 24        01        Manage human recreational activities so they do not conflict with habitat needs of  
25                    selected indicator species.
- 26        02        Semi-primitive non-motorized, semi-primitive motorized, roaded natural and rural  
27                    recreation opportunities can be provided.
- 28                    a. Increase the above use levels where necessary to provide adequate access to areas  
29                    or natural features that afford special or unique recreation opportunities.
- 30                    b. Reduce the above use level coefficients as necessary to reflect usable acres,  
31                    patterns of use, and general attractiveness of the specific management area type as  
32                    described in the ROS Users Guide, Chapter 25.
- 33        03        Reduce the above use levels where unacceptable changes to the bio-physical  
34                    resources will occur.
- 35                    c. Specify off-road vehicle restrictions based on ORV use management (FSM 2355,  
36                    R2 Supp 88)

- 1 d. See FSM 2331, FSM 7732, FSH 7709-12 (Trails Handbook), FSH 7109-11a and  
2 11b (Sign Handbook)
- 3 03 Permit undesignated sites in Frissell condition class 1 through 3 where unrestricted  
4 camping is permitted.
- 5 04 Manage site use and occupancy to maintain sites within Frissell condition class 3  
6 except for designated sites which may be class 4. Close and restore class 5 sites.
- 7 05 Prohibit motorized vehicle use off Forest System roads and trails (except  
8 snowmobiles operating on snow) in other alpine, and other ecosystems, where needed  
9 to protect soils, vegetation, or special wildlife habitat.

10 **USFS Management Area 4D Prescription**

11 Management of Developed Recreation Sites

- 12 01 Prohibit development of new developed recreation sites

13 Dispersed Recreation Sites

- 14 01 Prohibit motorized vehicle use off Forest System roads and trails (except  
15 snowmobiles operating on snow) where needed to protect soils, vegetation or  
16 specified wildlife habitat.

17 **USFS Management Area 5B Prescription**

18 Management of Developed Recreation Sites

- 19 01 Design, construct and operate only those developed sites which are needed to meet  
20 summer season management objectives and are appropriate for the established ROS  
21 designation. Close all developed sites during the winter management season.

22 Dispersed Recreation Management

- 23 02 Manage summer use-season for appropriate ROS opportunities
- 24 03 Provide roaded natural recreation opportunities within 0.5 mile of Forest arterial,  
25 collector, and local roads with better than primitive surfaces, which are open to public  
26 motorized travel.
- 27 Provide semi-primitive motorized recreation opportunities with a low to moderate  
28 incidence of contact with other groups and individuals within 0.5 mile of designated  
29 local roads with primitive surfaces and trails open to motorized recreation use.
- 30 Where local roads are closed to public motorized recreation travel, provide for  
31 dispersed non-motorized recreation opportunities. Manage recreation use to provide  
32 for the incidence of contact with other groups and individuals appropriate for the  
33 established ROS class.
- 34 Provide semi-primitive non-motorized recreation opportunities in all areas more than  
35 0.5 mile away from roads and trails open to motorized recreation use.

- 1 a. Increase the above use levels where necessary to provide adequate access to areas or  
2 natural features that afford special or unique recreation opportunities.
- 3 b. Reduce the above use level coefficients as necessary to reflect usable acres,  
4 patterns of use, and general attractiveness of the specific management area type as  
5 described in the ROS Users Guide, Chapter 25.
- 6 Reduce the above use levels where unacceptable changes to the bio-physical  
7 resources will occur.
- 8 c. Specify off-road vehicle restrictions based on ORV use management (FSM 2355,  
9 R2 Supp 88)
- 10 d. See FSM 2331, FSM 7732, FSH 7709 12 (Trails handbook), FSH 7109 11a and  
11 11b (Sign Handbook).
- 12 e. Prohibit open fires when the occurrence of fire rings exceeds Frissell Class 1 site  
13 conditions of 10 percent or more of the known campsites.
- 14 01 Manage winter use for very low or low densities. Close areas to human use to  
15 the degree necessary in winter to prevent disturbance of wildlife.
- 16 a. Close management area to cross-country ski trail development and to snowmobile  
17 use.
- 18 b. Do not provide parking or trailhead facilities during winter.

19 **USFS Management Area 6B Prescription**

20 Dispersed Recreation Management

- 21 01 Semi-primitive non-motorized, semi-primitive motorized, roaded natural and rural  
22 recreation opportunities can be provided.
- 23 02 Provide roaded natural recreation opportunities within 0.5 mile of Forest arterial,  
24 collector, and local roads with better than primitive surfaces, which are open to public  
25 motorized travel.
- 26 Provide semi-primitive motorized recreation opportunities with a low to moderate  
27 incidence of contact with other groups and individuals within 0.5 mile of designated local  
28 roads with primitive surfaces and trails open to motorized recreation use.
- 29 Where local roads are closed to public motorized recreation travel, provide for dispersed  
30 non-motorized recreation opportunities. Manage recreation use to provide for the  
31 incidence of contact with other groups and individuals appropriate for the established  
32 ROS class.
- 33 Provide semi-primitive non-motorized recreation opportunities in all areas more than 0.5  
34 mile away from roads and trails open to motorized recreation use.
- 35 a. Increase the above use levels where necessary to provide adequate access to areas or  
36 natural features that afford special or unique recreation opportunities.

- 1            b. Reduce the above use level coefficients as necessary to reflect usable acres, patterns of  
2            use, and general attractiveness of the specific management area type as described in the  
3            ROS Users Guide, Chapter 25.
- 4            Reduce the above use levels where unacceptable changes to the bio-physical resources  
5            will occur.
- 6            c. Specify off-road vehicle restrictions based on ORV use management (FSM 2355, R2  
7            Supp 88)
- 8            d. See FSM 2331, FSM 7732, FSH 7709 12 (Trails handbook), FSH 7109 11a and 11b  
9            (Sign Handbook).
- 10        02        Permit undesignated sites in Frissell condition class 1 through 3 where unrestricted  
11        camping is permitted.
- 12        03        Manage site use and occupancy to maintain sites within Frissell condition class 3  
13        except for designated sites which may be class 4. Close and restore class 5 sites.
- 14        04        Prohibit motorized vehicle use off Forest System roads and trails (except  
15        snowmobiles operating on snow) in other alpine, and other ecosystems, where needed  
16        to protect soils, vegetation, or special wildlife habitat.

17        **AHRA MP, Section 2b: Fisherman’s Bridge to Stone Bridge (incl. BCNM)**

18        River recreation is managed according to the AHRA MP with deference to BCNM designation.  
19        Although river recreation will be discussed as a key attribute of BCNM, decisions on recreation  
20        management of the river have already been completed in the AHRA MP and will not be re-  
21        analyzed through this planning process.

22        Recreation Outcomes:

- 23        • Maintained and improved integrity of BCNM ROVs including scientifically significant  
24        geological, ecological, riparian, cultural and historic (tribal) resources, and research of  
25        paleoecology, mineralogy, archaeology, and climate change
- 26        • Increased awareness and protection of natural landscapes
- 27        • Reduced impacts of high boating capacities
- 28        • Retained backcountry setting and undeveloped camping
- 29        • Reduced user conflicts
- 30        • Rafting Class III–IV experiences

31        Activity Emphasis:

- 32        • Boating Access
- 33        • Angling Access
- 34        • Camping
- 35        • Watchable Wildlife



1 The AHRA MP contains a Proposed Action, including facility development, which will be  
 2 included in the Final Planning Assessment.

3 In addition, the AHRA Draft MP-EA proposes boating capacity on the Arkansas River through  
 4 BCNM, which is defined as the river segment extending from Fisherman’s Bridge (upstream of  
 5 BCNM) to Stone Bridge (downstream of BCNM). The daily limits for commercial use on this  
 6 river segment is 360 boats during the period May 15-September 7 and 50 boats between  
 7 September 8 and May 14. The AHRA MP also defines boating limits for private users. These  
 8 limits are 240 boats per day on weekends and 150 boats on weekdays during the May 15 -  
 9 September 7 high use period. The limits drop to 100 boats per day September 8 - May 14. The  
 10 MP also defines a launch window for commercial users, which extends from 8:30 am to 3:30 pm.

11 **2.2.1.6 Needs for Change and Management Opportunities**

12 Given the existing and foreseeable conditions and trends for recreation and risks to BCNM  
 13 ROVs, the following management opportunities exist. Table 2-43 summarizes needs for change  
 14 and management opportunities to consider in the BCNM MP-EIS.

15 **Table 2-43 Needs for Change and Management Opportunities for Recreation**

Needs for Change	Management Opportunities
With increases in use and knowledge of the BCNM comes the need for mitigating resource and social concerns through facility development, education, and/or use limitations.	Evaluate non-system trails including but not limited to the existing location and layout of permitted non-system trails in the northeastern portion of the monument. Evaluate infrastructure (trails) for non-boating river access along the river. Continued and enhanced monitoring of dispersed recreational use throughout BCNM to track and evaluate impacts. Targeted management, restoration, and interpretation of BCNM’s historic and cultural heritage resources. Evaluate opportunities for outdoor learning and research. Continue an open and transparent dialogue of the impacts of recreationalists. Update and coordinate marketing materials to management visitor expectations and focus visitor use to desired locations. Partner with commercial outfitters/guiding operations to manage use through recreation zoning or similar methods.
Need for adequate and ample facilities to manage high-density areas (e.g., Hecla Junction, Ruby Mountain) to accommodate a diverse range of uses are needed.	Consider expanding and improving trails and river facilities to accommodate a variety of recreation users (equestrian, mountain bikers, seniors, ADA). Consider using recreation zoning for focused management to accommodate a range of opportunities.
An emphasis on low-developed, ‘primitive’ sites to provide more dispersed or rugged experiences without facilities is desired.	Provide places in BCNM that are harder to reach, where solitude can be found. Identify and evaluate the need and potential location for designated backcountry campsites for private and commercial use for both the river corridor and upland areas. Consider using recreation zoning for focused management to

	accommodate a range of opportunities.
--	---------------------------------------

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35

**2.2.2 Travel and Transportation Management**

ROVs for travel and transportation include BCNM’s role as a pre-historic and historic transportation corridor, as well as a means for contemporary access to recreation and ranching and the possibility of a Stage and Rail Trail:

- “The Browns Canyon area of the upper Arkansas River valley has long offered both a permanent source of water and a means of transportation for its human inhabitants. The area lies within the transition zone between the cultural traditions of the Great Basin and Plains peoples. As a transportation corridor where stable sources of subsistence resources could be found, both migrating people and permanent inhabitants left traces of their presence in this area. Ancestors of the Ute, Apache, Eastern Shoshone, and Comanche Indians are known to have traversed this dramatic landscape while hunting and gathering.”
- “Discovery of gold along the Arkansas River in the 1850s and the 1870s silver boom in Leadville brought an influx of people and a need for transportation. In the 1870s, stage roads carried thousands of passengers through this region every year. In the 1880s, after a multi-year legal and armed battle between rival rail companies, the Denver and Río Grande Railway became the major transportation option for the region. The section of railroad bed that runs through Browns Canyon east of the Arkansas River is eligible for listing on the National Register of Historic Places.”
- “Local communities have proposed and conducted a feasibility study for establishing the Arkansas Stage and Rail Trail, which would serve as a testament to this travel corridor's prehistoric and historic significance... The area also provides world class river rafting and outdoor recreation opportunities, including hunting, fishing, hiking, camping, mountain biking, and horseback riding.”

Planning issues and management concerns based on Proclamation 9232 and additional agency concerns include:

- What are the principal travel priorities in this area for the public, as well as for administrative and resource management activities (e.g., research and monitoring, grazing management, recreational use, or emergency or fire access)?
- What areas should be designated as open, closed, or limited for all travel modes (from motorized to non-motorized), based on opportunities provided and/or the need to protect resources?
- How will BLM address Ruby Mountain recreational mineral collection and social use in the monument baseline, public view-gathering and alternatives?

- 1       • How will transportation facilities, including the trail system and a potential rail to trail  
2       proposal, prepare for future urban expansion? What linkages could be developed to  
3       potentially connect trails in the monument to urban and riverfront trail systems?
- 4       • What options exist for improving access into the monument from sites in addition to  
5       Ruby Mountain, Hecla, and Turret?
- 6       • There have been many short-term exposure particulate matter (PM) studies over the last  
7       decade and many show that short-term exposure to PM (including dust) can cause serious  
8       health effects (high blood pressure, adverse brain function, stroke, heart attacks, etc.), and  
9       while there are many people that are going to the Monument / WSA to exert themselves  
10      physically (hike, etc.), has there been any consideration to paving or applying gravel  
11      routinely to the access roads and parking areas for the Monument / WSA to reduce PM /  
12      dust emissions which would also reduce poor visibility conditions in the area?

### 13   **2.2.2.1    Assessment Area**

14   The assessment area for travel and transportation management is defined as the BCNM  
15   boundary.

### 16   **2.2.2.2    Best Available Scientific Information**

17   BLM. 2006. Arkansas River Travel Management Plan. Available online at:

18       [https://eplanning.blm.gov/epl-front-](https://eplanning.blm.gov/epl-front-office/projects/lup/68393/89711/107220/Arkansas_River_TMP_Decision-Implementation.pdf)  
19       office/projects/lup/68393/89711/107220/Arkansas\_River\_TMP\_Decision-  
20       Implementation.pdf.

21   BLM. 2002. Eastern Colorado Resource Management Plan BLM and United States Forest Service  
22   (USFS). 2002. Fourmile Travel Management Plan and RMP Amendment. Available online at:  
23   [https://web.archive.org/web/20151008081428/http://www.blm.gov/style/medialib/blm/co/in-](https://web.archive.org/web/20151008081428/http://www.blm.gov/style/medialib/blm/co/information/nepa/royal_gorge_field.Par.46497.File.dat/CO-200-2002-0034EA.pdf)  
24   formation/nepa/royal\_gorge\_field.Par.46497.File.dat/CO-200-2002-0034EA.pdf.

25   Bowker, J.M., A.E. Askew, H.K. Cordell, C.J. Betz, S.J. Zarnoch, L. Seymour. 2012. Outdoor  
26   Recreation Participation in the United States—Projections to 2060: A Technical Document  
27   Supporting the Forest Service 2010 RPA Assessment. General Technical Report SRS-160.  
28   Asheville, NC: U.S. Department of Agriculture Forest Service, Southern Research Station.

29   Greater Arkansas River Nature Association. 2017. Friends of Fourmile TMA Brochure. Available  
30   online at: [http://garna.org/2013/wp-content/uploads/2013/07/Fourmile-Brochure-FINAL-](http://garna.org/2013/wp-content/uploads/2013/07/Fourmile-Brochure-FINAL-4.26.17-web.pdf)  
31   4.26.17-web.pdf.

32   USFS. 2009. Travel Analysis Process Report. Available online at:

33       [https://static1.squarespace.com/static/57754b452994ca3f91e9085e/t/586db2c9b3db2bba4127](https://static1.squarespace.com/static/57754b452994ca3f91e9085e/t/586db2c9b3db2bba41275047/1483584225005/USFS_2009_PSI+TAP+Report.pdf)  
34       5047/1483584225005/USFS\_2009\_PSI+TAP+Report.pdf.

1 USFS. 2013. Travel Analysis Process Report Addendum. Salida Ranger District. Available online  
2 at:  
3 [https://static1.squarespace.com/static/57754b452994ca3f91e9085e/t/586db1f7893fc02bb9972](https://static1.squarespace.com/static/57754b452994ca3f91e9085e/t/586db1f7893fc02bb9972c81/1483583997473/USFS_2013_PSI+TAP+Salida+RD+Report+Addendum.pdf)  
4 [c81/1483583997473/USFS\\_2013\\_PSI+TAP+Salida+RD+Report+Addendum.pdf](https://static1.squarespace.com/static/57754b452994ca3f91e9085e/t/586db1f7893fc02bb9972c81/1483583997473/USFS_2013_PSI+TAP+Salida+RD+Report+Addendum.pdf).

5 USFS. 2017. Pike and San Isabel NF Motor Use Vehicle – Travel Management Plan – EIS  
6 updates. Available online at: <http://www.psitravelmanagement.org>.

7 USFS. 2017. Pike and San Isabel NF Motor Use Vehicle – Travel Management Plan – EIS  
8 Scoping Report. Available online at:  
9 [https://static1.squarespace.com/static/57754b452994ca3f91e9085e/t/59c92c3bcd0f687a8b327](https://static1.squarespace.com/static/57754b452994ca3f91e9085e/t/59c92c3bcd0f687a8b327861/1506356314788/FinalPSItravelMgtScopingReport.pdf)  
10 [861/1506356314788/FinalPSItravelMgtScopingReport.pdf](https://static1.squarespace.com/static/57754b452994ca3f91e9085e/t/59c92c3bcd0f687a8b327861/1506356314788/FinalPSItravelMgtScopingReport.pdf).

11 See Table 2-38 for OHV visitor count data and additional references.

## 12 **GIS Data**

- 13 • BLM Boundary, BLM\_RGFO\_Field\_Office\_Boundary\_20170725. Accessed: 2017.
- 14 • BLM Recreation Sites, BLM\_RGFO\_RecPoints\_20170802. Accessed: 2017.
- 15 • BLM Recreation Areas, BLM\_RGFO\_RecPolys\_20170802. Accessed: 2017.
- 16 • BLM Alternative C. Alternative\_C\_Preferred\_Alt\_Copied\_20160708. Accessed: 2017.
- 17 • BLM GTLF Routes, BLM\_RGFO\_GTLF\_20170802. Accessed: 2017.
- 18 • USFS OHV Designations. OHV Designations Goldbelt\_TMP. Accessed: 2017.
- 19 • USFS Trails. PSICC\_MVUM\_TRAILS20170130. Accessed: 2017.
- 20 • USFS Roads. PSICC\_MVUM\_ROADS20170130. Accessed: 2017.

### 21 **2.2.2.3 Limitations/Data Gaps**

22 The PSICC is currently undertaking a Motor Use Vehicle Travel Management Plan – EIS that  
23 will designate existing roads and trails abutting or within the BCNM. Routes from the Proposed  
24 Action will be incorporated as they become available.

### 25 **2.2.2.4 Existing Conditions and Trends**

26 Existing conditions for travel and transportation are as follows:

- 27 • The public land access for BCNM is defined by five factors: 1) private land to the west,  
28 2) the Arkansas River and railroad rights of way (ROW) in the center, 3) WSA and  
29 Roadless Area designations to the east, 4) steep and rugged topography throughout, 5)  
30 USFS and BLM roads at the northern and eastern perimeters. For the purpose of this  
31 section and the access maps, “access” is defined as “public land which is physically and  
32 legally capable of being reached by the public.” Foot access on public land is unlimited  
33 except by one's desire and ability. The river itself is considered to be a legal means of

1 transportation by boat to public land. With this in mind, every acre of public land under  
2 consideration has some type of legal access.

- 3 • Chaffee County Roads: The region's vehicular transportation system has developed in a  
4 manner commensurate with the valley's low-intensity agricultural and recreational  
5 economy. There are three Chaffee County roads that serve as access routes (Figure 2-14).  
6 Maintenance is provided by Chaffee County.
  - 7 ○ Chaffee County Road 301 (Fisherman's Bridge) consists of one mile of graveled  
8 road accessing the Fisherman's Bridge recreation site from US Highway 285. This  
9 segment also serves the Ruby Mountain recreation site via Chaffee County  
10 Road 300. Road 301 averages 24 feet wide and has one bridge (Fisherman's  
11 Bridge), rebuilt in 1992.
  - 12 ○ Chaffee County Road 300 (Ruby Mountain Road) averages 20 feet in width and is  
13 3.5 miles in length. It accesses the Ruby Mountain Recreation Site and Browns  
14 Canyon National Monument on the east side of the river. There are no structural  
15 developments on this road.
  - 16 ○ Chaffee County Road 194 (Hecla Junction Road) consists of 2.5 miles of graveled  
17 road accessing Browns Canyon via US Highway 285. This road averages 20 feet  
18 in width. This route has received almost annual improvements for the past ten  
19 years due to the recreational traffic.
- 20 • OHV physical, social, and operational setting, benefits, and use are well-established,  
21 diverse, daily, and year round on the northern monument perimeter where BCNM adjoins  
22 the Fourmile Travel Management Area (BLM - 300; NFST 1434.A/1434). BCNM OHV  
23 use is summer seasonal on the Turret Trail (NFSR 184) and signed as seasonally closed  
24 by the USFS for critical winter range for mule deer, elk, and big horn sheep from  
25 December 1—April 15. BCNM OHV use on the eastern up slope monument perimeter  
26 through Bassam Park and Aspen Ridge (NFSR 185) is popular, diverse, daily, and  
27 summer seasonally high on NFSR 185. NFSR 185 is managed under a winter closure  
28 south of the Cottonwood creek drainage on the north end and south of the State Land  
29 Board managed land on the south end in section 16 (December 1-April 15th) Sporadic  
30 and irregular unauthorized OHV use has been documented in the Sawmill and Green  
31 Gulch drainage's administered as BLM Wilderness Study Area from NFSR 184 and off  
32 of NFSR 1434.
- 33 • The trailhead just east of the Ruby Mountain Campground provides parking and serves as  
34 a jump-off point for the highest concentration of non-motorized/non-mechanized trails in  
35 BCNM. This includes Turret Trail (BLM T6045) that connects Ruby Mountain Trailhead  
36 to NFSR 184. The River Bench Trail (BLM T6045A) provides access to a good sample  
37 of the northern portion of BCNM and has an overlook of Arkansas River. The Catkin  
38 Gulch Loop (BLM T6046) provides the deepest access into BCNM and a primitive,  
39 wilderness type of experience. BLM 6045B connects from the river to the trail system via

1 a 9 mile round trip. From Hecla Junction Campground and Trailhead, Seidel’s Suckhole  
2 Trail travels along the west bank of the river that has long been used by anglers, hikers,  
3 and boaters. The trail is outside of the Arkansas River Travel Management Plan;  
4 therefore, it has not been designated.

- 5 • The northeastern corner of BCNM also has some non-system trails, including one used  
6 by a permitted outfitter for guided hiking and horseback tours, as well as several routes  
7 that appear to receive some use by the public. Some of these non-system routes connect  
8 to the northern end of NFSR 184 and NFSR 185.
- 9 • Another popular non-system trail (Austin Trail) runs along Railroad Gulch near the  
10 southern end of the BCNM. Also, numerous non-system routes exist along the river  
11 corridor and extend upland from popular lunch spots, campsites, and trailheads along the  
12 river.
- 13 • The eastern boundary is defined by a rugged high clearance level road, NFSR 185,  
14 known as Aspen Ridge. This road provides several locations where motorized dispersed  
15 camping uses occur and access to the highest peaks located within BCNM. NFSR 184,  
16 also known as Turret Road, serves as the main access route into the center of BCNM.  
17 This road extends off of Aspen Ridge and provides the only vehicle access into the  
18 interior of BCNM via high clearance vehicles or OHV. Motorized access ends at the  
19 USFS and BLM boundary. The BCNM northern boundary follows NFST 1434, a  
20 motorized trail open to vehicles 50 inches or less in width. NFST 1434 has a seasonal  
21 closure from December 1 - April 15 every year. On the northeastern corner of BCNM  
22 there is one non-motorized trail (NFST 1435), which is open to hiking, biking, and  
23 equestrian use.
- 24 • Railroad: The Union Pacific rail line has been placed into a “Reserve” category. This  
25 does not entail removal of the rails and allows for future railroad use.
  - 26 ○ The Heart of the Rockies Historical Corridor Rail Trail and similar rails-to-trails  
27 concepts have been proposed for decades which would require abandonment or  
28 utilization of portions of the Union Pacific rail line from Salida to Leadville. Part  
29 of that abandonment would have been to “railbank” the entire corridor, allowing  
30 for retention of the corridor while not in railroad use. A study was initiated to  
31 review the potential for converting the rail line into a trail system (this study can  
32 be seen at the AHRA office in Salida). Currently, the rail line has not been  
33 abandoned but instead placed into a “reserve” category. As such, the rail-to-trail  
34 proposal has been held in abeyance until the “reserve” process comes to a  
35 completion and/or a Rails-with-Trails plan is proposed/accepted.
  - 36 ○ The Stage and Rail Trail (S&RT) Master Plan was developed in 2015 that  
37 proposes non-motorized uses along non-motorized single track, open public roads  
38 and highways. As of late 2017, progress has been made establishing a 64-mile-  
39 long route along the Upper Arkansas River from Salida to Leadville. A largely

1 volunteer-driven project under the non-profit Greater Arkansas River Nature  
2 Association, the Stage and Rail Trail project plans to celebrate, preserve and, in  
3 some sections, use historic routes of the 1880s Cañon City to Leadville Stage  
4 Road and historic Colorado Midland RR. In the vicinity of BCNM the S&RT  
5 follows Highway 285. CPW, Chaffee County, Salida, and Buena Vista have  
6 designated the conceptual route within their jurisdictions. In 2016 the governor’s  
7 Colorado the Beautiful Program listed the Stage and Rail Trail project as one of  
8 “Colorado’s 16” highest priority trails. The Colorado Mountain Club's  
9 Conservation Department has taken over as the lead in coordinator of the Stage  
10 and Rail Trail planning effort.

- 11 • There are no National Scenic, Historic, or Recreational Trails in the BCNM.

12 Trends related to travel and transportation are as follows:

- 13 • Travel management is a topic of concern for BLM and USFS. From 1995 to 2003, OHV  
14 annual sales more than tripled to over 1.1 million vehicles, and from 1982 to 2001,  
15 driving motor vehicles off road became one of the fastest growing categories of outdoor  
16 activity in the country, with western States seeing the highest level of participation  
17 (Cordell, Betz, Green, and Stephens 2008). This resulted in a variety of new management  
18 challenges for land managers that they were not prepared for (BLM 2015).

#### 19 **2.2.2.5 Existing Management Direction**

20 The Proclamation established the following limitations: “Except for emergency or authorized  
21 administrative purposes, motorized and mechanized vehicle use in BCNM shall be allowed only  
22 on roads and trails designated for such use, consistent with the care and management of the  
23 objects identified above. After the date of the proclamation, new roads or trails may only be  
24 designated for motorized vehicle use in areas west of the Arkansas River and at the Ruby  
25 Mountain Recreation Site and then only as necessary to provide reasonable river or campground  
26 access, consistent with the applicable management plan. Forest Road 184 may be realigned or  
27 improved only if for the care and management of the objects identified above or as necessary for  
28 public safety.”

29 The Proclamation further recognized “the operation or use of the existing railroad corridor as a  
30 railroad right of way pursuant to valid existing rights or for recreational purposes consistent with  
31 the care and management of the objects identified above.”

32 Federal agencies are directed to manage motorized vehicle use on public lands through  
33 Executive Order 11644 and Executive Order 11989, which have been incorporated into the Code  
34 of Federal Regulations (CFR) under 43 CFR 8342.1.

### 35 **BLM Royal Gorge Resource Area RMP (Eco-Subregion 1, Arkansas River)**

#### 36 Recreation

1 Objective Decisions

2 Motorized recreation OHV opportunities will be enhanced. OHV use will be managed through  
3 limitations or closures in areas with special natural or primitive recreational values; responsible  
4 OHV use will be encouraged throughout this unit where use is allowed.

5 Allocation Decisions

- 6 • The majority of the FO will be limited to designated roads and trails or seasonally:
  - 7 ○ Riparian areas (perennial)
  - 8 ○ Fishery habitat
  - 9 ○ Big game birthing habitat
  - 10 ○ Big game critical winter habitat
  - 11 ○ Raptor nesting/fledgling habitat
  - 12 ○ NRHP sites
  - 13 ○ ACECs
  - 14 ○ Developed recreation sites.
- 15 • Browns Canyon WSA is closed to OHV use [also closed to mechanized travel and  
16 mechanized tool use].

17 Action Decisions

- 18 • Informational materials for motorized OHV opportunities will be developed.
- 19 • Media, informational materials, and possibly physical barriers will be used to encourage  
20 users to stay on existing roads in open and limited areas.
- 21 • Incorporate emphasis for public awareness to national programs; e.g., Tread Lightly, into  
22 Integrated Activity Plans.
- 23 • Develop partnerships with local OHV clubs to assist in coordinating and enhancing OHV  
24 opportunities.
- 25 • Trail heads and motorized/multiple use trails will be established to meet public demand.

26 Transportation and Access

27 Objective Decisions

- 28 • Transportation system will be improved and maintained to facilitate public access and  
29 administrative monitoring as well as minimizing roads on BLM-administered lands.
- 30 • A maintenance schedule will be established for BLM system roads on an average of once  
31 every 10 years. Roads not maintained in good condition under this schedule will either  
32 have limited use or be closed and reclaimed.
- 33 • Signing, fencing, and marking boundaries will continue on all BLM-administered land  
34 identified for retention and multiple use management.



- 1 • The degree of access will be guided by the designated recreation opportunity spectrum;  
2 i.e.,
  - 3 ○ Wilderness: 5-mile access points
  - 4 ○ Semi-Primitive Non-Motorized: 5-mile access points
  - 5 ○ Semi-Primitive Motorized: 3-mile access points
  - 6 ○ Roaded Natural: 1-mile access points

7 Allocation Decisions

- 8 • Permanent transportation system will include:
  - 9 ○ BLM roads
  - 10 ○ BLM trails
- 11 • New access by easement acquisition or new construction will include:
  - 12 ○ Priority areas
    - 13 ▪ Arkansas River sites
    - 14 ▪ Potential additional access resulting from NRA designation

15 Action Decisions

- 16 • Update map through IAPs.

17 **Travel Management Rule (36 CFR, Part 212, subparts A and B), 2005 Final Rule**

18 This 2005 final rule requires designation of those roads and trails that are open to motor vehicle  
19 use along with types of appropriate vehicles and seasonal closures. The rule and road  
20 designations are intended to:

- 21 • Sustain natural resource values through more effective management of motor vehicle use
- 22 • Enhance opportunities for motorized recreation experiences on NFS lands
- 23 • Address needs for access to NFS lands
- 24 • Preserve areas of opportunity on each National Forest for non-motorized travel and  
25 experiences

26 **2012 Colorado Roadless Rule**

27 The 2012 Colorado Roadless Rule is a state-specific rule that provides management direction for  
28 conserving and managing roadless areas on national forest system lands for current and future  
29 generations while allowing certain activities that are important to the citizens and economy of  
30 Colorado to continue. All National Forest System Lands within the BCNM are in the Aspen  
31 Ridge Roadless Area.

1 **USFS Management Area 2B Prescription**

2 Transportation System Management

- 3 01 Manage public use of roads with techniques such as seasonal closure, time of day  
4 closures, etc.

5 Trail System Management

- 6 01 Maintain existing motorized routes or construct new routes needed as part of the  
7 transportation system. Develop loop routes and coordinate them to compliment semi-  
8 primitive motorized opportunities in adjacent semi-primitive motorized ROS class  
9 areas.

- 10 a. On all non-forested areas, motorized trail and local road density is not to exceed 4  
11 miles per square mile.

12 **USFS Management Area 4B Prescription**

- 13 01 Manage road use to provide for habitat needs of management indicator species,  
14 including road closures and area closures, and to maintain habitat effectiveness.

15 **USFS Management Area 5B Prescription**

16 Transportation System Management

- 17 01 Road traffic and road cut or fill slopes must not block big game movement in  
18 delineated migration routes or corridors.
- 19 02 Allow new roads in the management area only if needed to meet priority goals  
20 outside the management area or to meet big game goals on the management area.  
21 Obliterate temporary roads within one season after planned use ends.
- 22 a. New permanent or temporary roads constructed in the management area must meet  
23 the following criteria:
- 24 ○ There is no feasible alternative to build the road outside the area and the road is  
25 essential to achieve priority goals and objectives of contiguous management  
26 areas, or to provide access to land administered by other government agencies or  
27 to contiguous private land.
  - 28 ○ The State Fish and Wildlife agency has been fully involved in the road location,  
29 planning, and alternative evaluation.
  - 30 ○ Planned management of road use during winter will prevent or minimize  
31 disturbance of wintering big game animals, or will allow hunting and other  
32 management activities needed to meet wildlife management objectives.
  - 33 ○ Roads are constructed to the minimum standards necessary to provide safety for  
34 the road use purpose.

- 1           ○ Roads cross the winter range in the minimum distance feasible to facilitate the  
2           necessary use.
- 3       03   Close existing roads, prohibit off-road vehicle use and manage non-motorized use to  
4       prevent stress on big game animals.
- 5       a. Opening of existing roads during winter can be approved if the following criteria  
6       are met:
- 7           ○ There is no reasonable alternative for owners or managers of contiguous private  
8           land or public land to reach their lands during winter.
- 9           ○ Road use, off-road vehicle use, or non-motorized use of the area is essential and is  
10          the minimum necessary to meet priority resource management goals and  
11          objectives.
- 12          ○ The State Fish and Wildlife Agency is fully involved in planning human use of  
13          area during winter.

14   **2.2.2.6   Needs for Change and Management Opportunities**

15   Table 2-44 summarizes needs for change and management opportunities to consider in the  
16   BCNM MP-EIS.

17   **Table 2-44 Needs for Change and Management Opportunities for Travel and**  
18   **Transportation**

Needs for Change	Management Opportunities
Increasing population pressures and increased sales and use of off-highway vehicles result in greater resource impacts and increased user conflict.	Inventory and treatment of non-system roads. Designation of a non-motorized road system, namely Seidel Suckhole trail designation. Continue working with OHV users on education and awareness regarding system road designation, seasonal restrictions, and restoration. Decisions in the ongoing PSICC Travel Management Plan may impact recreation access into the BCNM via NFSR 184 between December 1 and April 15, annually.

19   **2.2.3   Range and Livestock Grazing**

20   Livestock grazing management within the boundaries of the BCNM is a traditional use that has  
21   occurred on both the BLM and Forest Service lands since initiation of the 1934 Taylor Grazing  
22   Act. While the entire BCNM is open to grazing, only approximately 10 percent is accessible on  
23   Forest and 5 percent on BLM due to steep terrain, thick brush, and boulder fields. Permitted  
24   livestock grazing on public lands is an essential resource to the ranchers in the Arkansas Valley.  
25   Historically, ranching in the Arkansas River valley was one of the primary economic  
26   contributors to the area. Ranching in the Arkansas River valley is a viable cultural attribute and  
27   economic industry. Recreation and residential development have rapidly expanded throughout

1 the Arkansas Valley displacing many of the local ranches resulting in loss of forage production  
2 and community open space.

3 Recreation on public lands in Chaffee County has dramatically increased over recent years and  
4 the increase is expected to continue. The result has led to increased conflicts between user  
5 groups. Livestock grazing occasionally has negative impacts on recreational experiences such as  
6 hiking, biking and camping. Some users are negatively impacted where livestock leave manure,  
7 attract flies, or degrade solitude and viewshed values. Conversely, recreational activities have  
8 negative impacts to livestock operations and management. In areas of heavy recreation use,  
9 impacts affect livestock distribution patterns, livestock are harassed by pets and humans, gates  
10 are left open, range improvements are tampered with and supplements are stolen. Unauthorized  
11 recreational off-road vehicle use occurs, which impacts a variety of resources including livestock  
12 grazing. Many negative impacts could be mitigated through both public education and adaptive  
13 management. Permitted grazing on public lands is important to preserve the ranching heritage  
14 and open space in the Arkansas River valley.

15 ROVs and guidance from Proclamation 9232 for range and livestock grazing resource uses  
16 include the following:

- 17 • BCNM is an important resource for area ranchers. Livestock grazing in BCNM is an  
18 economic contributor and helps preserve the ranching heritage and open space in the  
19 Arkansas River valley.
- 20 • Livestock grazing in BCNM is subject to valid existing rights. Holding and transferring  
21 grazing preference will be conducted in compliance with federal regulations.
- 22 • Laws, regulations, and policies followed by the BLM or the USFS in issuing and  
23 administering grazing permits or leases on lands under their jurisdiction will continue to  
24 apply with regard to the lands in the BCNM and management practices that promote  
25 healthy sustainable use and while meeting BCNM values.

26 Planning issues and management concerns based on Proclamation 9232 and additional agency  
27 concerns include:

- 28 • How should uses, including recreational use, grazing, motorized and mechanized vehicle  
29 use, etc., be managed to provide for wildlife (including special status species) habitat  
30 needs?
- 31 • How will grazing activities, including maintenance and construction of rangeland  
32 improvement facilities, be managed to protect wilderness values?
- 33 • What are the principal travel priorities in this area for the public, as well as for  
34 administrative and resource management activities, such as grazing management?

1 **2.2.3.1 Assessment Area**

2 The geographic area considered for characterizing conditions and trends for range and livestock  
3 grazing is the BCNM boundary.

4 **2.2.3.2 Best Available Scientific Information**

5 The Best Available Scientific Information in the form of data and reports is listed below:

6 Bartlett, G., L. Cervený, J. Golomb, J. Harner, and R. Gronewald. 2017. Social Landscape  
7 Assessment of Browns Canyon National Monument. Final Report. August, 2017.

8 BLM. 2005 & 2017. Royal Gorge Field Office Public Land Health Assessment Evaluation 2005  
9 and 2017.

10 BLM. 2018. Rangeland Administration System. Available online at: <https://www.blm.gov/ras/>.

11 Chaffee County Commissioners. 2014. Chaffee County Land Use Code: Right to Farm and  
12 Ranch. Available online at: <https://www.gigshowcase.com/EndUserFiles/42453.pdf>.

13 Society for Range Management. 1956. Range Conditions and Trends Resulting from Winter  
14 Concentrations of Elk in Rocky Mountain National Park, Colorado. Available online at:  
15 <http://www.jstor.org/stable/3894240>.

16 PSICC. 2008. Rangeland Allotment Management Planning in the Salida-Leadville Planning Area  
17 Final Environmental Assessment. September 2008.

18 USFS. 2013. Pike and San Isabel National Forests and Cimarron and Comanche National  
19 Grasslands Annual Monitoring Reports for Fiscal Year 2013.

20 USFS. 2008. Rangeland Allotment Management Planning in the Salida-Leadville Planning Area.  
21 Final Environmental Assessment including both the Salida and Leadville Decision Notices  
22 and FONSI. Rocky Mountain Region R2. Pike and San Isabel National Forests, Salida and  
23 Leadville Ranger Districts.

24 Williams, Jeffrey. 2017. Bureau of Land Management. Browns Canyon National Monument  
25 Management Planning Specialist Assessment Report and notes. Working draft dated July 15,  
26 2017.

27 **GIS Data**

28 • BLM Grazing Allotments, BLM\_RGFO\_GrazingAllotmtments\_20170802. Accessed:  
29 September 27, 2017.

30 • BLM Range Improvement Lines. BLM\_RGFO\_RangeImprovementLines\_20170802.  
31 Accessed: September 27, 2017.

32 • BLM Range Improvement Polygons. BLM\_RGFO\_RangeImprovementPolys\_20170802  
33 Accessed: September, 27 2017.

- 1 • BLM Range Improvement Points. BLM\_RGFO\_RangeImprovementPts\_20170802.  
2 Accessed: September 27, 2017.
- 3 • USFS Grazing Allotments. 2018. GIS Lyer for Allotment Boundaries and INFRA  
4 database for Permitted AUMs.
- 5 • USFS Grazing Allotments, BC\_Allotments. Accessed: September 27, 2017.
- 6 • USFS Range Improvement Lines. BC\_ImprovementLines.Accessed: September 27,  
7 2017.
- 8 • USFS Range Improvement Points. BC\_ImprovementPoints.Accessed: September 27,  
9 2017.
- 10 • USFS Grazing Pastures. BC\_Pastures.Accessed: September 27, 2017.
- 11 • USFS Salida Allotments, Salida\_Allotments.Accessed: September 27, 2017.
- 12 • USFS Salida Pastures. Salida\_Pastures.Accessed: September 27, 2017.

13 **2.2.3.3 Limitations/Data Gaps**

14 None

15 **2.2.3.4 Existing Conditions and Trends**

16 The BCNM encompasses portions of five BLM allotments and two USFS allotments. These  
17 allotments are operated by two permittees (Table 2-45). Combined, the grazing allotments are  
18 located on 17,175 acres of federal land within the BCNM’s 21,589 acres. Figure 2-15 presents  
19 the grazing allotments, pasture boundaries, and range improvements within BCNM. Within these  
20 allotments, livestock grazing is much localized to the western edge of BCNM primarily south of  
21 Ruby Mountain, Bassam Park, and Aspen Ridge Road FS185 and 185D. Table 2-45presents  
22 grazing allotments within BCNM. Table 2-46presents specific Animal Unit Month (AUM)  
23 information on USFS allotments within BCNM. Table 2-47 presents specific AUM information  
24 on BLM allotments within BCNM.

**Table 2-45 Grazing Allotments within BCNM**

Allotment	Agency	Season Of Use	Management	Acres within BCNM	Percent within BCNM
Aspen Ridge C&H	USFS	6/10 – 9/30	7 pasture rest rotational system	2,020	13.42
Cameron C&H	USFS	6/1 – 10/31	14 pasture rest rotational system	5,540	11.22
Hecla Junction East	BLM	4/15 – 6/10	Single pasture custodial	2,960	95.04
Hecla Junction West	BLM	10/1 – 3/31	Single pasture custodial	563	33.14

***ECOSYSTEMS, RESOURCES, CONDITIONS, AND TRENDS***

Ruby Mountain	BLM	10/1 – 11/30 and spring trailing	Single pasture custodial	5,234	99.90
Sugarloaf Mountain	BLM	10/1 – 3/31	Single pasture custodial	121	4.33
Three Mile Creek	BLM	10/1 – 3/31	Single pasture custodial	736	86.93
<b>Total</b>				<b>17,175</b>	

Sources: BLM 2017, USFS 2008

1 Existing conditions and trends for range and livestock grazing are:

- 2 • Current grazing management practices address the kind, numbers, and class of livestock,  
3 season, duration, distribution, frequency and intensity of grazing use. These practices are  
4 conducted in a manner that promotes plant and soil health on a sustainable basis. Range  
5 improvement infrastructure is in place to serve as a management tool to enhance these  
6 practices.
- 7 • Assessments of impacts to vegetation are based on expectations of normal precipitation  
8 during the life of the plan. Long-term grazing use levels are based on the effectiveness of  
9 the AMP process, through evaluation of monitoring information (e.g., utilization studies  
10 and actual use data), and modifications of those use levels as the need occurs.
- 11 • BLM allotments within the BCNM are regularly assessed to determine conformance with  
12 Standards for Public Land Health and Guidelines for Livestock Grazing Management in  
13 Colorado. BLM land within BCNM was determined to be meeting Standards for Public  
14 Land Health in 2005 and 2017 (BLM 2005 & 2017).
- 15 • The Rangeland Allotment Management Planning EA (2008) identified a disparity  
16 between “existing condition” and “desired condition” for the USFS allotments within the  
17 BCNM. The summary identified a need for change from current management where  
18 some areas may not be meeting or moving towards desired conditions in an acceptable  
19 timeframe. As a result, the 2008 EA analyzed best management practices using adaptive  
20 management techniques to adjust management to meet the needs and resolve disparities  
21 between current and desired conditions on the ground. Current management on the USFS  
22 grazing allotments is following this strategy and moving towards meeting desired land  
23 health conditions (PSICC 2008).

24 **Table 2-46 AUMs on USFS Allotments within BCNM**

Allotment	Total AUMs in Allotment	Total Acres in Allotment	Acres/AUM	Percent within BCNM (acres)	Estimated AUMs within BCNM
Aspen Ridge	1,636	15,053	9	13.4	219
Cameron	1,205	49,385	41	11.2	135

Source: USFS 2018

25  
26

1 **Table 2-47 AUMs within BLM Allotments within BCNM**

Allotment	Permitted Active AUMS	Suspended AUMS <sup>1</sup>	Total AUMS
Ruby Mountain	35	81	116
Hecla Junction East	17	35	52
Hecla Junction West	14	28	42
Sugarloaf Mountain	15	0	15
Three Mile Creek	6	0	6

2 <sup>1</sup> Suspended AUMS are set aside due to management constraints or other various reasons. They can be re-activated through  
 3 NEPA analysis. They are part of the preference and can be transferred from one operator to another.  
 4 Source: BLM 2018

5

6 Drivers and stressors for range and livestock grazing are:

- 7 • Increased recreation use in BCNM will likely lead to increased conflicts between user  
 8 groups resulting in challenges to overall range management.
- 9 • Recreation on public lands in Chaffee County and BCNM will continue to increase,  
 10 possibly dramatically.
- 11 • Ranching in the Arkansas River valley will continue to contribute importantly to the local  
 12 economy.
- 13 • Permitted livestock grazing on public lands will continue to be an important factor to  
 14 preserve ranching heritage and open space in the Arkansas River valley.
- 15 • Growth and development will continue to expand on both private and public lands in  
 16 Chaffee County and will further displace and negatively cumulatively impact the local  
 17 ranching community.
- 18 • Climate change could gradually impact vegetation and water availability in BCNM, thus  
 19 impacting forage and water sources for livestock.
- 20 • Range improvements, both existing and new, are management tools used to support  
 21 management objectives and ensure that future livestock use continues to help the  
 22 allotments achieve Land Health Standards and Desired Conditions.

23 **2.2.3.5 Existing Management Direction**

- 24 • Proclamation 9232 states that “Laws, regulations, and policies followed by the BLM or  
 25 the USFS in issuing and administering grazing permits or leases on lands under their  
 26 jurisdiction shall continue to apply with regard to the lands in the monument” (2015).  
 27 Prior to BCNM designation, permitted livestock grazing has been authorized under the  
 28 1996 RGRMP and 1984 Pike – San Isabel Forest Plan.

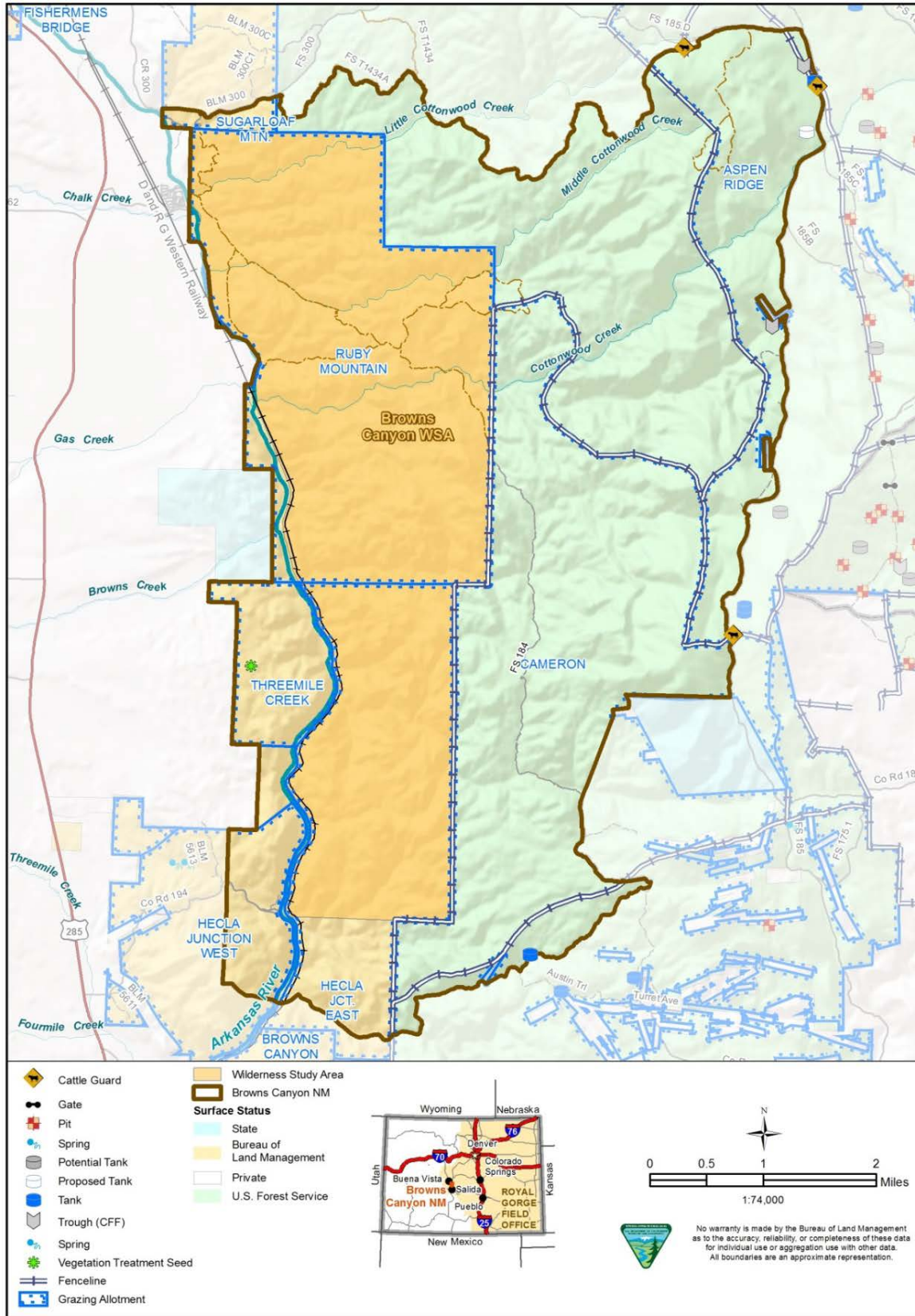


- 1       • Current grazing management practices address the kind, numbers, and class of livestock,  
2       season, duration, distribution, frequency, and intensity of grazing use. These practices are  
3       conducted in a manner that promotes plant and soil health on a sustainable basis. Range  
4       improvement infrastructure is in place to serve as a management tool to enhance these  
5       practices.

6 Table 1-2 lists relevant, existing Federal, state, and local management direction for range and  
7 livestock grazing in the BCNM. The primary legal mandates applicable to the management of  
8 cultural resources include:

- 9       • 43 CFR 4100. Grazing Administration - Exclusive of Alaska; General (§§ 4100.0-1 -  
10       4100.0-9)
- 11       • 43 CFR 4110. Qualifications and Preference (§§ 4110.1 - 4110.5)
- 12       • 43 CFR 4120. Grazing Management (§§ 4120.1 - 4120.5-2)
- 13       • 43 CFR 4130. Authorizing Grazing Use (§§ 4130.1 - 4130.9)
- 14       • 43 CFR 4140. Prohibited Acts (§ 4140.1)
- 15       • 43 CFR 4150. Unauthorized Grazing Use (§§ 4150.1 - 4150.4-5)
- 16       • 43 CFR 4160. Administrative Remedies (§§ 4160.1 - 4160.4)
- 17       • 43 CFR 4170. Penalties (§§ 4170.1 - 4170.2-2)

18 In addition, BLM Management Objectives and Direction, and USFS Management Prescriptions  
19 that are specific to range and livestock grazing are presented below.



1  
2 **Figure 2-15 Grazing Allotments within BCNM**

1 **BLM Royal Gorge Resource Area RMP (Eco-Subregion 1, Arkansas River)**

2 Objective Decisions

- 3 • Livestock grazing season-of-use and stocking rates based on 1981 grazing EIS and  
4 existing monitoring data will continue.
- 5 • IAPs will be prioritized based on conflicts with riparian areas, and critical wildlife  
6 habitat, and ACECs.

7 Allocation Decisions

- 8 • None applicable

9 Action Decisions

- 10 • Livestock “drift” onto uncontrolled private land will be eliminated through a combination  
11 of BLM fencing, cooperative projects, or by eliminating grazing.
- 12 • Allotments will be categorized as follows:
- 13 ○ Improve allotments
- 14 ○ Maintain allotments
- 15 ○ Custodial allotments
- 16 ○ Unallotted allotments

17 **USFS Management Area 2B Prescription**

- 18 01 Manage livestock distribution and stocking rates to be compatible with recreation use.  
19 Locate structural improvements to meet visual quality objectives.

20 **USFS Management Area 4B Prescription**

- 21 01 Prescribe livestock grazing systems to achieve objectives for management indicator  
22 species.
- 23 02 Apply wildlife and livestock forage allowable use guides specified in Forest  
24 Direction. Modify so needs of management indicator species are met.
- 25 03 Structural range improvement should be designed to benefit wildlife and livestock.  
26 a. Structural improvements will not adversely affect big game movement.

27 **USFS Management Area 4D Prescription**

- 28 01 Protect aspen regeneration
- 29 02 Maintain fair or better range conditions

30 **USFS Management Area 5B Prescription**

- 31 01 Manage grazing to favor big game and to achieve the wildlife populations identified  
32 in statewide comprehensive wildlife plans.

- 1           a. Maintain vegetation in fair or better range condition.
- 2           b. Limit livestock use of browse and herbaceous plant production to that not needed
- 3           by big game.
- 4        02    Prescribe livestock grazing systems to achieve winter range habitat objectives.

**5   USFS Management Area 6B Prescription**

- 6        01    Use only intensive grazing systems or remove livestock when recovery of range
- 7        condition cannot be accomplished by an intensive grazing system.
- 8        02    Improve range condition to fair or better or forage value rating to moderately high or
- 9        better.
- 10       a. Base range condition on the standards in Range analysis Handbook (FSH 2209 21
- 11       03    Invest in cost-effective allotment management and associated range improvements
- 12       a. Base economic analysis on Project Effectiveness Analysis Handbook (FSH 2209
- 13       11).
- 14       04    Invest in cost-effective grazing management and rangeland productivity
- 15       improvements. Where improvements include water developments, a water right in the
- 16       name of the United States must be obtained.
- 17       05    Structural improvements will not adversely affect big game movement.

**18   2.2.3.6   Needs for Change and Management Opportunities**

19   Given the resource conditions and trends and existing management in BCNM, Table 2-48  
 20   summarizes needs for change and management opportunities to consider in the BCNM MP-EIS.

**21   Table 2-48 Needs for Change and Management Opportunities for Range and Livestock**  
 22   **Grazing**

Needs for Change	Management Opportunities
<b>Common to All Allotments</b>	
Recreation on public lands in Chaffee County has dramatically increased over recent years and the increase is expected to continue. As growth and development continue to expand on both private and public lands, ranching and livestock use may be displaced and/or conflict between recreation and livestock may increase. There exists a desire for a balance between traditional and historic resource uses (grazing, logging, prospecting) and recreation-based industries (fishing, whitewater boating, hiking) and amenities (Bartlett et al. 2017).	Manage recreation use and livestock grazing to minimize conflicts between these user groups and other natural resource objectives, such as wetland and riparian condition.  Educate recreationists about the value of livestock grazing and local ranching heritage.

<p>Need to utilize grazing as a management tool to maintain healthy ecosystems.</p>	<p>Limit adverse effects from livestock grazing in seeps and springs, especially in Bassam Park.</p> <p>Manage livestock grazing to achieve a balance of forage use between cattle and wildlife that will maintain healthy vegetation and ecosystems.</p> <p>Utilize Best Grazing Management Practices or Adaptive Management to improve resource conditions on an allotment in a timely manner when: determination is made that Land Health Standards are no longer being met; threats exist that Land Health may not meet into the future under current management; long term monitoring identifies declining resource condition in response to current management; and response to unforeseen circumstances such as flooding, drought and wildfire.</p> <p>The ability to use motorized access to existing range improvements and future improvements for maintenance and new construction. Motorized access would be within the scope of the grazing permit and conducted within designated routes.</p>
<b>BLM</b>	
<p>BLM land within BCNM was determined to be meeting Standards for Public Land Health in 2005 and 2017. Therefore, current management of range and livestock grazing is meeting objectives.</p>	<p>Continue with current management based on Public Land Health Standards and Guidelines for Livestock Grazing Management in Colorado (BLM 2005 &amp; 2017).</p>
<p>Fences no longer utilized for grazing could be removed to reduce wildlife barriers and entanglements.</p>	<p>Inventory and assess existing range improvements. Abandon and remove structural improvements that are no longer needed. Improvements that are designated for retention should be improved and upgraded to meet current standards.</p>
<b>USFS</b>	
<p>The Rangeland Allotment Management Planning EA (2008) identified a disparity between “existing condition” and “desired condition” for the USFS allotments within the BCNM. The summary identified a need for change from current management where some areas may not be meeting or moving towards desired conditions in an acceptable timeframe.</p>	<p>Continue with current management and utilize best management practices using adaptive management techniques to continue moving the trend toward desired land health conditions.</p>

**1 2.2.4 Land Use Authorizations, Rights-of-Way and Withdrawals**

2 A right-of-way grant is an authorization to use a specific piece of public land for a certain project,  
 3 such as a road, pipeline, transmission line, communication site, or energy-related project on  
 4 public land for a for a specific period. In general, a BLM ROW or USFS ROW is granted for a  
 5 term appropriate to the life of a project. Land use ROWs are authorized by grants, leases, or  
 6 permits. Such authorizations are issued to businesses for commercial purposes and to private  
 7 citizens for non-commercial purposes. ROWs are issued to other Federal agencies, as well as  
 8 state, county, and local government agencies.

1 An ROW is typically authorized through a grant, although sometimes a permit or lease may be  
2 issued. Permits are generally short-term authorizations (not to exceed three years) that have a  
3 negligible impact on the land (e.g., film permits, temporary storage areas, and apiaries). Leases  
4 are usually long-term authorizations requiring a significant capital investment (e.g.,  
5 communication sites).

6 Special designations, such as the Browns Canyon WSA and ACEC, on public lands prior to the  
7 Proclamation were generally avoided or excluded from ROWs. Land use authorizations, when  
8 approved within specially designated areas on an individual basis, are subject to stringent  
9 stipulations such as surface reclamation, weed control, protection of cultural, plant, or wildlife  
10 resources.

- 11 • Planning issues and management concerns based on Proclamation 9232 and additional  
12 agency concerns include:
- 13 • What BCNM boundaries need to be located and monumented to avoid future property  
14 boundary conflict?
- 15 • How does BLM address antiquated public lands survey on south portion of western  
16 monument boundary?
- 17 • How does BLM insure proactive understanding of federal boundaries in currently hard to  
18 reach locations?
- 19 • How does BLM and USFS address resource management questions that cross or abut  
20 public-private boundaries?
- 21 • How does BLM address surveyed boundary trespass at north west boundary?
- 22 • How do BLM and USFS address continuity of resource use and protect North Railroad  
23 and Stafford gulches?
- 24 • How does USFS address Mascott Load-permit issues on south eastern monument  
25 boundary?

#### 26 **2.2.4.1 Assessment Area**

27 The BCNM boundary is the assessment area for rights-of-way and land use authorizations.

#### 28 **2.2.4.2 Best Available Scientific Information**

29 BLM. 2018. BCNM Socioeconomic and Environmental Justice Baseline Assessment. In-progress,  
30 February 2018.

#### 31 **GIS Data**

- 32 • AHRA Draft Management Plan and revised Cooperative Management Agreement,  
33 Cooperative Management Lands GIS layer, CPW\_AHRA\_CMA\_Boundary\_032016.shp.  
34 Accessed: January 10, 2018.

- 1 • BLM Mineral Estate, BLM\_CO\_FederalMineralEstate\_20170802.shp. Accessed: January
- 2 10, 2018.
- 3 • BLM Rights of Way, BLM\_CO\_RightsOfWay\_LR2000\_20170802.shp. Accessed:
- 4 January 10, 2018.
- 5 • BLM Surface Management, BLM\_CO\_SurfaceManagementAgency\_20170725.shp.
- 6 Accessed: January 10, 2018.
- 7 • BLM Withdrawals, BLM\_CO\_WithdrawalsCases\_LR2000\_20170802.shp. Accessed:
- 8 January 10, 2018.
- 9 • ROW Avoidance Areas GIS layers for Eastern Colorado RMP for a variety of resources
- 10 such as Backcountry Conservation Areas, Terrestrial Wildlife, etc. Accessed: January 10,
- 11 2018.

12 **2.2.4.3 Limitations/Data Gaps**

- 13 • USFS Mineral Estate
- 14 • USFS Rights of Way [*Addressed in BLM\_CO\_RightsOfWay\_LR2000\_20170802.shp?*]
- 15 • USFS Withdrawals
- 16 • Mining claims

17 **2.2.4.4 Existing Conditions and Trends**

18 Land use authorizations within BCNM have been issued as shown in (Table 2-49Table 2-49).

19 The following land uses are evident in the landscape of BCNM: power generation, CPW  
 20 Recreation and Public Purposes (R&PP) leases and development at Rainbow Mountain and  
 21 Hecla Junction, communications facilities, Union Pacific Railroad, and RS 2477 county roads.

22 **Table 2-49 BLM ROWs within BCNM**

ROW	Reference	Legal Description
COC-77056 – Proclamation 9232	Browns Canyon AMS	6 <sup>th</sup> PM T15S/78W/Sec12,13,24,25 T15S/77W/Sec18,19,20,29,30,31,32 NM PM T51N/8E/11,12,13,14,23,24,25,26
EO 7/2/1910	Withdrawal Power Site Res 92	6 <sup>th</sup> PM T15S/78W/Sec12,13 T15S/78W/Sec24,25
COC-24224 01	Prop Prof Withdrawal Recreation Area	6 <sup>th</sup> PM T15S/78W/Sec12,24,25 T15S/77W/Sec31

COC-49757 01	R&PP Lease (AHRA)	6 <sup>th</sup> PM T15S/78W/Sec12 T15S/77W/Sec31
Acg. C 29994	Withdrawal to US	6 <sup>th</sup> PM T15S/78W/Sec24
Acg. C 29995	Withdrawal to US	T15S/78W/Sec24 T15S/77W/Sec30
SO 4/29/1922	Withdrawal Power Site CI 32	6 <sup>th</sup> PM T15S/78W/Sec25
COC-73740	Communication Site	6 <sup>th</sup> PM T15S/77W/Sec31
CO94000	UP RR ROW 200' width Total	6 <sup>th</sup> PM T15S/77W/Sec31 NM PM T51N/8E/Sec11,14,26
COC-49757	R&PP Lease (AHRA- Hecla Junction)	NM PM T51N/8E/Sec23
COC-31548	Chaffee County Road ROW	NM PM T51N/8E/Sec23,26
COC-5250	10' ROW	NM PM T51N/8E/Sec26
D 051838	Recon to US	NM PM T51N/8E/Sec25

1

2 As residential development increases adjacent to public lands, the potential for trespass and  
 3 encroachment also increases. Additional time, personnel may be needed for prevention,  
 4 detection, and resolution of trespass and encroachment.

5 **2.2.4.5 Existing Management Direction**

6 Per Proclamation 9232, establishment of the BCNM is “subject to valid existing rights. Lands  
 7 and interests in lands not owned or controlled by the Federal Government within the boundaries  
 8 described on the accompanying map shall be reserved as a part of the BCNM, and objects  
 9 identified above that are situated upon those lands and interests in lands shall be part of the  
 10 BCNM, upon acquisition of ownership or control by the Federal Government.” There are no  
 11 private surface inholdings within BCNM, so only interests in lands are potentially subject to  
 12 valid existing rights.

13 The Proclamation recognized “the operation or use of the existing railroad corridor as a railroad  
 14 right of way pursuant to valid existing rights or for recreational purposes consistent with the care  
 15 and management of the objects identified above.”



1 The Proclamation further appropriated and withdrew all Federal lands within the BCNM “from  
2 all forms of entry, location, selection, sale, leasing, or other disposition under the public land  
3 laws or laws applicable to the U.S. Forest Service, including location, entry, and patent under the  
4 mining laws, and from disposition under all laws relating to mineral and geothermal leasing,  
5 other than by exchange that furthers the protective purposes of the monument.” It further stated  
6 that “Nothing in this proclamation shall be deemed to revoke any existing withdrawal,  
7 reservation, or appropriation; however, the monument shall be the dominant reservation.”

## 8 **Royal Gorge Resource Area RMP Eco-Region 1 (Arkansas River)**

### 9 Objective Decisions

- 10 • Minor ROWs will be authorized on a case-by-case basis only when outside exclusion  
11 areas.
- 12 • Minor ROWs could be authorized in the avoidance areas only when stipulations protect  
13 the criteria resources and values.

### 14 Allocation Decisions

- 15 • ROW exclusion areas will include:
  - 16 ○ WSAs
  - 17 ○ Raptor nesting/fledgling areas
  - 18 ○ Special status plants
  - 19 ○ Special status animals (nesting/fledging areas only)
  - 20 ○ NRHP sites
- 21 • ROW avoidance areas will include:
  - 22 ○ Big game birthing habitat
  - 23 ○ Big game critical winter habitat
  - 24 ○ VRM II in ACECs
  - 25 ○ Developed recreation sites
  - 26 ○ Designated corridors
  - 27 ○ Non-excluded areas
- 28 • Withdrawal and Classifications
  - 29 ○ Other withdrawals (continued or revoked)
  - 30 ○ Waterpower/reservoir withdrawals (continued or revoked)
  - 31 ○ New BLM withdrawals will be initiated as follows:
    - 32 ○ Riparian areas (perennial)
    - 33 ○ Big game birthing habitat
    - 34 ○ Fishery habitat
    - 35 ○ Special status plant habitat
    - 36 ○ Special status animal habitat

- 1           ○ Potential NRHP sites
- 2           ○ Portions of ACECs
- 3           ○ VRM II in ACECs
- 4           ○ Developed recreation sites
- 5           ○ Recreation values within Arkansas River corridor

6   Action Decisions

- 7           ○ None

8   **2.2.4.6 Needs for Change and Management Opportunities**

9   Given the resource conditions, trends and existing management in BCNM, Table 2-50  
10 summarizes needs for change and management opportunities to consider in the BCNM MP.

11 **Table 2-50 Needs for Change and Management Opportunities for Land Use**  
12 **Authorizations, Rights-of-Way and Withdrawals.**

Needs for Change	Management Opportunities
<p>Owing to the Proclamation, the 1996 RGFO RMP and 1984 PSICC LRMP decisions regarding ROWs, land use authorizations, withdrawals and classifications need to be revised. Specifically, withdrawals will not be issued in the future and ROW Avoidance Areas may not be necessary for BCNM in the future because of these withdrawals. The new MP-EIS should specifically address these.</p>	<p>To the greatest extent possible, subject to applicable law, through land use planning and project-level processes and decisions, avoid siting ROWs in BCNM. New land use authorizations will be allowed to further the protective purposes of the monument the intent of the Proclamation. Subject to applicable law, avoid designating or authorizing use of transportation or utility corridors within the BCNM or designate the BCNM as an exclusion area. BLM and USFS should exercise discretion to deny ROW applications if they are inconsistent with the component’s designating authority.</p> <p>All projects would be analyzed on an individual site-specific basis with ROVs considered in the NEPA analysis. New and existing withdrawals will be administered in accordance with the Proclamation and FLPMA on an individual, site-specific basis.</p> <p>Future utilities could be collocated with existing utilities/disturbance within existing ROWs; BMPs and/or mitigation measures (e.g. buried utilities) could be considered to address impacts to recreation and wildlife resources. Best practices, stipulations, mitigation, terms, conditions, and other ways to manage compatible uses and minimize negative impacts to ROVs would be developed as appropriate.</p> <p>When processing a new ROW application, to the greatest extent possible through the NEPA process, consider routing or siting the ROW outside of the BCNM, and may need to develop contingency corridors to guide future expansion of utilities around the BCNM. If new ROWs are authorized in Monuments and NCAs, consistent with 43 CFR Parts 2800 and 2880 and to the greatest extent possible the ROW should share, parallel, or adjoin existing ROWs. Pursuant to 43 CFR 3809.11(c), project proponents should submit a plan of operations for any operations causing surface disturbance greater than casual use.</p> <p>Establish priorities for acquisition of lands and other interests within or adjacent to BCNM that will enhance ROVs and reduce at-risk resources. Consistent with BLM policy, the primary acquisition method will be to rely on willing sellers or donors. Acquisition of property and easements</p>

	along Arkansas River is identified as a goal and objective in the Royal Gorge RMP and AHRA-MP. Plan decisions are encumbered by the Union Pacific ROW, and R&PP leases and Cooperative Management Agreement with CPW.
--	--

1    **2.3       Special Designations (ACEC, WSR, WSA, Roadless Areas)**

2    The following section assesses the existing special designations within the BCNM including  
3    BLM SRMA, BLM ACEC, Recreational Wild and Scenic River, WSA and USFS Inventoried  
4    Roadless Areas. Many of these designations extend beyond the BCNM. There are no scenic or  
5    historic byways or national scenic or historic trails in the assessment area.

6    Of these, the Wild and Scenic River, WSA, and roadless area special designations are evaluated  
7    and designated through separate processes. The planning process for BCNM will not change  
8    these and they will continue to be managed under existing management policy and guidelines,  
9    though the MP-EIS will look for opportunities to better fulfill the intent of each designation.  
10   Management direction provided by these special designations and the need for change will guide  
11   alternatives.

12   Planning issues and management concerns based on Proclamation 9232 and additional agency  
13   concerns include:

- 14       • How will the Browns Canyon WSA be managed to protect wilderness characteristics and  
15       provide outstanding opportunities for solitude and/or primitive and unconfined  
16       recreation?
- 17       • Is special management still warranted for the recognized relevant and important values of  
18       the ACEC designation? Given the management that will be developed to protect the  
19       resources identified in the proclamation, what additional lands should be considered for  
20       ACEC status?
- 21       • What stream segments are eligible and suitable for recommendation as candidate wild  
22       and scenic rivers (WSR) and which tentative classification of wild, scenic, or recreational  
23       should be applied?
- 24       • How should administrative use be managed to protect special area values?
- 25       • How will grazing activities, including maintenance and construction of rangeland  
26       improvement facilities, be managed to protect wilderness values?
- 27       • Are additional administrative designations (e.g., scenic or backcountry byways,  
28       backcountry conservation areas, All-American Roads, national recreation trails,  
29       recreation management areas, watchable wildlife viewing sites) needed to provide  
30       recognition, protection, and enjoyment of resources within the proclamation?
- 31       • What additional management guidelines are necessary to manage the portion of the WSA  
32       under the 6330 Manual guidelines? How should this area be managed if released by  
33       Congress?

- 1 • Are there lands with wilderness characteristics other than the WSA, and if so, how should  
2 they be managed? (Note: lands with wilderness characteristics is not a special  
3 designation, but is managed as a resource).
- 4 • What role should fire play in the monument and the WSA?
- 5 • What physical, social, and operational settings would provide those experiences and  
6 benefits while still protecting wilderness values in the Browns Canyon WSA and USFS  
7 roadless areas?

### 8 **2.3.1 Assessment Area**

9 The geographic area considered for characterizing conditions and trends for these special  
10 designations is the BCNM boundary. However, many of these designations extend beyond the  
11 BCNM boundary.

### 12 **2.3.2 Best Available Scientific Information**

13 BLM. 2017. Draft Wild & Scenic River Suitability Report - Royal Gorge Field Office. February  
14 2017.

15 BLM. 2017. Preliminary Evaluation of Potential ACECs - Royal Gorge Field Office. February  
16 2017.

17 National Park Service (NPS). 2014. Nationwide Rivers Inventory. Online database. U.S.  
18 Department of the Interior, National Park Service. Available online at:  
19 <http://www.nps.gov/ncrc/programs/rtca/nri/index.html>.

20 USFS. 2012. 2012 Colorado Roadless Rule.

21 USFS. 2011. Pike and San Isabel National Forest Roadless Area Profiles

22 USFS. 2001. 2001 Colorado Roadless Rule.

23 USFS. 1979. RARE II - Roadless Area Review and Evaluation: Final Environmental Statement.

### 24 **GIS Data**

25 • BLM Wild and Scenic Rivers, BLM\_CO\_WildAndScenicRivers\_20170802. Accessed:  
26 2017.

27 • BLM Areas of Critical Environmental Concern. BLM\_RGFO\_ACEC\_20170725.  
28 Accessed: 2017.

29 • BLM Wilderness Study Areas. BLM\_RGFO\_WSA\_20170725. Accessed: 2017.

30 • CPW Boundary, CPW\_AHRA\_CMA\_Boundary\_032016. Accessed: 2017.

31 • BLM Lands with Wilderness Characteristics. BLM\_RGFO\_LWC\_Inventory\_20160404.  
32 Accessed: 2017.

- 1       • USFS Colorado Roadless Areas. RoadlessArea\_CO\_2012. Accessed: 2017.

2   **2.3.3     Limitations/Data Gaps**

3   The PSICC is currently undertaking a Motor Use Vehicle Travel Management Plan – EIS that  
4   will designate existing roads and trails abutting or within the BCNM.

5   The USFS has not yet completed an evaluation of areas for potential wilderness, pursuant to FSH  
6   1909.12, Chapter 70 Wilderness Evaluation.

7   **2.3.4     Existing Conditions and Trends**

8   Browns Canyon ACEC:

- 9       • Section 202 of the FLPMA mandates giving priority to the designation and protection of  
10      ACECs. ACECs, defined in Section 103(a), are areas where special management  
11      attention is needed to protect and prevent damage to important historical, cultural, and  
12      scenic values; fish, or wildlife resources; or other natural systems or processes (BLM  
13      1988).
- 14      • The Browns Canyon ACEC was designated in the 1996 RGRMP. This ACEC consists of  
15      9,755 acres within the BCNM, of scenic river canyon within the WSA recommended to  
16      Congress as wilderness for its unique naturalness character; primitive recreation; water-  
17      related recreation; and scenic and visual qualities. It is under consideration as an  
18      archaeological district.
- 19      • The bluffs in the area have very significant raptor values, and the area has significant  
20      bighorn sheep habitat values. This area includes BLM, private, and State land considered  
21      very important to the integrity and management of this canyon environment (BLM 1996).

22   Arkansas River Recreational WSR:

- 23       • The National Wild and Scenic River System (NWSRS) was created through the Wild and  
24      Scenic Rivers Act of 1968 to preserve certain rivers with outstanding natural, cultural,  
25      and recreational values in a free-flowing condition for the enjoyment of present and  
26      future generations.
- 27       • A complete and thorough Wild and Scenic River Analysis for the Arkansas River was  
28      completed during the BLM’s 1996 RGRMP process. The Wild and Scenic River Study  
29      Report was completed in 1992, as a part of that process, and is located within Appendix L  
30      of BLM’s Draft RMP published in September of 1993. An updated eligibility report  
31      (2015) has been prepared in conjunction with the revision currently being developed for  
32      the BLM’s RGRMP.
- 33       • System rivers are designated as wild, scenic, or recreational. The NWSRS defines  
34      Recreational Rivers as those rivers or sections of rivers that are readily accessible by road

1 or railroad, that may have some development along their shorelines, and that may have  
2 undergone some impoundment or diversion in the past.

- 3 • In both the 1992 and 2015 updated report, all segments of the Arkansas River upstream  
4 of the Royal Gorge Park were determined to be eligible (free-flowing with outstandingly  
5 remarkable values) and met the criteria under the “recreational” classification. An  
6 updated suitability report has not yet been finalized but will be incorporated into the  
7 revised Eastern Colorado RMP.
- 8 • The Arkansas River Segment 2, which flows through the western edge of BCNM, is  
9 classified as a Suitable –Recreational Wild and Scenic River. This Segment flows from  
10 Buena Vista to Salida.

11 Browns Canyon WSA:

- 12 • The Browns Canyon WSA is bounded on the southwest by the Union Pacific ROW  
13 (which parallels the Arkansas River for this stretch). Traveling north, the western  
14 boundary is the Arkansas River (for 2 miles). Just over a mile of private land forms the  
15 remainder of the western boundary at Ruby Mountain, which is the northwest corner of  
16 the WSA. The eastern boundary is formed by US Forest Service lands. The WSA  
17 contains 6,614 acres.
- 18 • Browns Canyon WSA ranges in elevation from about 7,400 feet along the river to about  
19 9,000 feet near the eastern boundary. The area is very rugged and is dissected with  
20 drainages and gulches. The majority of the area’s vegetation cover is piñon pine with  
21 some ponderosa pine and Douglas fir. Aspens, willows, and cottonwoods can be found in  
22 the drainages.
- 23 • Although the Arkansas River is not inside the WSAs, the relationship between the river  
24 and the WSA is prominent. The WSA provides a natural experience for those floating  
25 and fishing on the river. The first few miles of the canyon contain nine popular lunch  
26 sites that are used almost daily by boaters during June, July, and August. Boaters who  
27 stop for lunch along the river rarely venture more than a couple of hundred feet into the  
28 WSA. Resource monitoring of these popular lunch sites has been on-going since 1989.
- 29 • The two main access points by non-boating recreationists are from the Ruby Mountain  
30 recreation site, located at the northwest boundary of the WSA, and via Forest Service  
31 lands on the eastern boundary. Approximately 1,000 recreationists currently visit the  
32 WSA annually, excluding those who lunch along the river. Recreation activities include  
33 horseback riding, rock climbing, hiking, backpacking, hunting, and rock hounding.
- 34 • In recommending this WSA for wilderness designation, the area’s spectacular scenery  
35 and outstanding opportunities for primitive, unconfined recreation and solitude were the  
36 primary considerations. The rugged topography and groupings of vegetation within the  
37 WSA create a variety of settings ranging from canyons and gulches with enclosed,  
38 intimate qualities to open ridge tops with sweeping views of the Arkansas River valley

1 and the nearby Sawatch Mountain range, the highest group of peaks in the Rocky  
2 Mountains. Numerous rock spires located throughout the area make Browns Canyon  
3 particularly scenic. The WSA's relatively low elevation and proximity to a major  
4 highway also make it accessible for recreational activities during the winter seasons when  
5 nearby high-elevation wilderness areas cannot be reached by most potential users (BLM  
6 1991).

7 **Inventoried Roadless Areas:**

- 8 • Roadless areas provide many social and ecological benefits. Roadless areas are important  
9 because they are, among other things, sources of drinking water, quality fish and wildlife  
10 habitat, semi-primitive or primitive recreation areas, and naturally appearing landscapes.  
11 Approximately 11,185 acres (95 percent) of USFS lands within the BCNM are  
12 designated as the Aspen Ridge Colorado Roadless Areas (CRA) unit. Together the WSA  
13 and Aspen Ridge CRA acreage comprises approximately 87 percent of the BCNM.
- 14 • The Aspen Ridge CRA which as inventoried in 2001 has a rich diversity of lower and  
15 mid-elevation plant and animal species habitat (elevation range 7,000 – 10,000 feet). It  
16 provides important elk and deer winter range and reproductive areas, as well as unique  
17 rock outcrops and canyon habitats for raptors such as falcons, eagles, hawks, and owls  
18 (USFS 2011). CPW has also identified that the Aspen Ridge CRA contains important  
19 habitats for other wildlife species including black bear, bighorn sheep, elk, mountain lion,  
20 mule deer, Townsend's big eared bat, and woodpeckers (USFS 2011). Most of the Aspen  
21 Ridge CRA shows little to no disturbance from human use. Livestock grazing does occur  
22 but is limited due to the scarcity of water. There is evidence of historic mining and  
23 railroading but no existing range improvements. Recreation opportunities in the Aspen  
24 Ridge CRA include hiking, wildlife viewing, hunting, and opportunities for solitude and  
25 scenic vistas.

26 **Drivers and stressors for all special designations are similar and include:**

- 27 • Population growth throughout Colorado is likely to increase visitation and recreational  
28 use that may lead to increases in social trail development, additional disturbed areas for  
29 picnic and camping sites, and decreases opportunities for semi-primitive recreation and  
30 solitude.
- 31 • The AHRA MP further describes stressors related to the river. River rafting day use and  
32 camping areas in the Browns Canyon WSA are producing impacts to the naturalness of  
33 the area. These sites have been monitored annually since 1996. While some sites have  
34 seen reductions in use and are no longer evident, other sites continue to see regular and  
35 continuous use. The size of the impact does not appear to be increasing or decreasing.  
36 However, the level of trash and fire rings has decreased over the years as awareness of  
37 river users has improved.

- 1 • Changes to fire regimes resulting in more frequent and/or intense burns may decrease  
2 naturalness and require noticeable management activity to mitigate impacts.
- 3 • Increased demand for wood harvesting (local and commercial) may lead to a loss of  
4 naturalness.
- 5 • Increased livestock grazing pressure in years with low precipitation and vegetative  
6 production may decrease wildlife forage and habitat quality.
- 7 • Improvements to hunting equipment technology may decrease opportunities for natural or  
8 historic hunting experiences.

### 9 **2.3.5 Existing Management Direction**

10 The following identifies existing mandates, authorities, and policy guidance relevant to ACECs:

- 11 • 43 CFR 1610.7-2(b). Designation of Areas of Critical Environmental Concern
- 12 • The AHRA-MP outlines monitoring of the natural resources to ensure those impacts  
13 associated with the lunch and camping areas in Browns Canyon are not increasing. No  
14 activities or actions proposed in Browns Canyon are expected to negatively affect the  
15 special values found in this ACEC.

16 The following identifies existing mandates, authorities, and policy guidance relevant to WSR:

- 17 • Wild and Scenic Rivers Act of 1968 (16 U.S.C. 1271)
- 18 • Title 36 of the Code of Federal Regulations, Part 297, Wild and Scenic Rivers (36 CFR  
19 part 297).
- 20 • BLM Manual 6400, Wild and Scenic Rivers—Policy and Program Direction for  
21 Identification, Evaluation, Planning, and Management. Release 6-136. July 13, 2012.

22 The following identifies existing mandates, authorities, and policy guidance relevant to WSA:

- 23 • The Wilderness Act of 1964 (16 U.S.C. 1131) directs the United States to administer  
24 wilderness areas to provide for the “preservation of their wilderness character,” to retain  
25 their “primeval character and influence,” and to protect and manage the natural  
26 conditions of wilderness areas so that they “generally appear to have been affected  
27 primarily by the forces of nature, with the imprint of man’s work substantially  
28 unnoticeable.”
- 29 • The rules at Title 36 of the Code of Federal Regulations, Part 293, Wilderness --  
30 Primitive Areas (36 CFR part 293), include requirements for scenic use, preservation and  
31 protection of wilderness character, and promotion and perpetuation of specific values  
32 including solitude and inspiration.
- 33 • The RGFO will continue to manage all WSAs in accordance with BLM Manual 6330,  
34 Management of Wilderness Study Areas. Legislation has been before Congress, primarily  
35 regarding Browns Canyon WSA, over the last 14 years; however, no legislation has



1 succeeded in creating any new wilderness areas. Colorado U.S. Senator Mark Udall  
2 sponsored a bill to create BCNM, but the bill was never enacted. President Obama used  
3 his authority under the Antiquities Act of 1906 to create BCNM in March 2015.

- 4 • The AHRA-MP identifies the need to continue monitoring with objectives of no fires  
5 rings, benches, and no new sites. It also calls for the need to designate dispersed sites and  
6 consider a reservation system if demand exceeds thresholds and impacts increase. This  
7 action should be sufficient to protect the WSA values within the project area.

8 The following identifies existing mandates, authorities, and policy guidance relevant to  
9 Inventoried Roadless areas:

- 10 • The 2001 Roadless Rule (36 CFR, Part 294 and 66 Federal Register 3244-3272)  
11 establishes prohibitions on road construction, road reconstruction, and timber harvesting  
12 on roughly one-third of all NFS lands, or approximately 58.5 million acres of inventoried  
13 roadless areas. The intent of the 2001 roadless rule is to provide lasting protection for  
14 inventoried roadless areas within National Forest System lands in the context of multiple-  
15 use management.
- 16 • 36 CFR Part 294 – Special Areas: Roadless Area Conservation Final Rule (Vol. 66, No.  
17 9)
- 18 • The USFS further adopted a state-specific final rule (Subpart D, 2012 Colorado Roadless  
19 Rule) to provide management direction for conserving and managing the approximate 4.2  
20 million acres of CRAs. The final Colorado Roadless Rule addresses current issues and  
21 concerns specific to Colorado.
- 22 • 36 CFR Part 294 – Special Areas: Roadless Area Conservation; Applicability to the  
23 National Forests in Colorado Final Rule (Vol. 77, No.128)
- 24 • USFS 2008 Evaluation of Areas for Potential Wilderness 72 Federal Register 4478-4481  
25 (Jan. 31, 2007) and Forest Service Handbook 1909.12-2007-1, Chapter 70 Wilderness  
26 Evaluation

27 Table 1-2 lists relevant, existing Federal, state, and local management direction for range and  
28 livestock grazing in the BCNM. In addition, BLM Management Objectives and Direction, and  
29 USFS Management Prescriptions that are specific to special designations are presented below.

### 30 **Royal Gorge Resource Area RMP Eco-Subregion 1 (Arkansas River)**

#### 31 ACECs

#### 32 Objective Decisions

33 The Browns Canyon ACEC will be managed to protect and enhance special values.

#### 34 Allocation Decisions

- 35 • 9,755 acres are designated as the Browns Canyon ACEC and managed as follows:

- 1           ○ Livestock grazing will be excluded in some areas and adjusted on other areas.
- 2           ○ Timber harvesting and wood gathering will be allowed for enhancement of
- 3           protected resources
- 4           ○ Land will be leased with NSO stipulations, as appropriate to protect resources.
- 5           ○ Land will be closed to mineral entry and mineral materials disposal, as
- 6           appropriate to protect resources.
- 7           ○ 9,222 acres of VRM II will be avoided for major ROWs
- 8           ○ 9,755 acres will remain in public ownership
- 9           ○ 9,755 acres will be limited to designated roads and trails for OHV use
- 10          ○ 7,457 acres within WSAs will be closed to OHV use

**11   2.3.6   Needs for Change and Management Opportunities**

12   Given the resource conditions and trends and existing management in BCNM, Table 2-51  
 13   summarizes needs for change and management opportunities to consider in the BCNM MP.

14   **Table 2-51 Needs for Change and Management Opportunities for Special Designations**

Needs for Change	Management Opportunities
Demands for, and supplies of, renewable resources change over time in response to social values, new technology, and new information. In the future, expanding urban areas and increased fragmentation of private lands make it likely that the largest tracts of undeveloped land will be those in public ownership.	Explore a range of alternatives to reduce fragmentation.
A natural environment’s ecological systems are substantially free from the effects of modern civilization and generally appear to have been affected primarily by forces of nature. Factors to consider include the presence of non-native species and the health of ecosystems, plant communities, and plant species that are rare or at risk.	Explore a range of alternatives to reduce fragmentation.
Opportunities for solitude or primitive and unconfined recreation are measured by an area’s vastness of scale, the degree of challenge and risk to users, and opportunities to experience isolation from the evidence of humans. A wide range of experiential opportunities includes physical and mental challenge, adventure and self-reliance, isolation, self-awareness, and feelings of solitude, and inspiration. Primitive-type recreation activities include hiking, backpacking, using pack and saddle stock, fishing, hunting, floating, kayaking, cross country skiing, camping, and enjoying nature.	An area’s special features and values are identified by determining its ecologic, geologic, scientific, educational, scenic, historical, or cultural significance. Examples include unique fish and wildlife species, unique plants or plant communities, connectivity, potential or existing research natural areas, outstanding landscape features, and significant cultural resource sites. The MP-EIS should address opportunities and limitations to these activities.  Manageability considers the ability of the Forest Service to manage areas as wilderness as required by the 1964 Wilderness Act. The area must be managed as an enduring resource of wilderness, untrammled by humans, retaining its primeval character, with its natural character protected. Such factors as size, shape, and juxtaposition to external influences should be considered.

<p>The USFS recognize that timber cutting or removal and road construction/reconstruction have had the greatest likelihood of altering and fragmenting landscapes, resulting in immediate, long-term loss of roadless area characteristics (USFS 2012). Maintaining the current roadless areas within the BCNM are important management considerations for the future.</p>	<p>Explore a range of alternatives to additional roadless area</p>
--	--

1

1 **3.0 CONSISTENCY WITH OTHER PLANS AND**  
2 **COOPERATING AGENCIES**

3 At the time a proposed land use plan is prepared, a consistency review will be conducted to  
4 confirm that it does not conflict with officially approved plans, programs, and policies of Tribes,  
5 other Federal agencies, and state and local governments (to the extent practical with Federal law,  
6 regulation, and policy).

7 The following Federal recovery plans were identified during the planning assessment phase for  
8 subsequent consistency review: Mexican Spotted Owl Recovery Plan (FWS 2012) and fire  
9 management plans. Cooperating agencies should also identify significant opportunities for  
10 enhancing coordination or consistency. Other state, county, and city decisions or plans are listed  
11 on Table 1-2.

12 **3.1 Potential Cooperating Agencies**

13 The BLM and USFS will invite all eligible Federal agencies, State and local governments, and  
14 federally recognized Indian tribes to participate as cooperating agencies in the development of  
15 the MP-EIS. Agencies with jurisdiction by law or agencies with special expertise are eligible to  
16 be cooperating agencies. Cooperating agencies assist at nearly every state of the land use  
17 planning process, such as identifying issues that need to be addressed, collecting inventory data,  
18 or developing management alternatives. Below is a preliminary list of agencies that the BLM and  
19 USFS have determined to be eligible for cooperating agency status for the MP-EIS. Additional  
20 eligible cooperating agencies may be identified during scoping or subsequent steps of the land  
21 use planning process.

22 **3.1.1 Potential Federal Agency Cooperators**

- 23 • U.S. Fish and Wildlife Service, Mountain-Prairie Region Office  
24 • U.S. Environmental Protection Agency  
25 • U.S. Department of Defense

26 **3.1.2 Potential State Agency Cooperators**

- 27 • History Colorado, Office of Archaeology and Historic Preservation consistent with 2012  
28 BLM Colorado State Protocol Agreement  
29 • Colorado Department of Public Health and Environment  
30 • Colorado Department of Natural Resources (Colorado Parks and Wildlife)

1   **3.1.3     Potential County Cooperators**

- 2       • Chaffee County
- 3       • Park County
- 4       • Fremont County

5   **3.1.4     Potential Community Cooperators**

- 6       • Town of Buena Vista
- 7       • City of Cañon City
- 8       • City of Salida
- 9       • Johnson Village
- 10      • Town of Smelertown
- 11      • City of Poncha Springs
- 12      • Community Water Boards

13   **3.1.5     Potential Tribal Cooperators**

Apache Tribe of Oklahoma	Northern Ute Tribe	Pueblo of Santa Ana
Cheyenne and Arapaho Tribes of Oklahoma	Oglala Lakota Tribe	Pueblo of Santo Domingo
Cheyenne River Lakota Tribe	Pawnee Nation of Oklahoma	Pueblo of Zuni
Comanche Tribe of Oklahoma	Pueblo of Acoma	Rosebud Sioux Tribe
Crow Creek Sioux	Santa Clara Pueblo	San Ildefonso Pueblo
Jicarilla Apache Nation	Pueblo de Cochiti	Shoshone Tribe
Kiowa Tribe of Oklahoma	Pueblo of Laguna	Southern Ute Tribe
Navajo Nation	Pueblo of Nambe	Standing Rock Sioux Tribe
Northern Arapaho Tribe	Pueblo of Ohkay Owinegh	Taos Pueblo
Northern Cheyenne Tribe	Pueblo of Picuris	Ute Mountain Ute Tribe

14   **3.1.6     Other Potential Cooperators**

- 15      • Community Water Conservancy Districts
- 16      • Arkansas River Water Conservancy Districts

1 **3.1.7 Government to Government Consultation**

2 The BCNM is not contiguous with any tribal lands, and no trust assets are present. There are no  
3 programmatic agreements, memoranda of understanding, or plans that are co-signed between the  
4 BLM, USFS, and the tribes.

5

## 4.0 SPECIFIC MANDATES AND AUTHORITY

### 4.1 Introduction

In addition to the mandates and authorities listed in Section 1.1.4, there are numerous legal bases for management of National Monuments on BLM and USFS-managed lands. Some of the more significant laws that must be considered in management planning are as follows:

- Creative Act of March 3, 1981 (26 Stat. 1103, 16 USC 471; repealed by 704(a) of FLPMA, 90 Stat. 2792)
- Organic Act of June 4, 1987 (30 Stat. 35)
- Transfer Act of 1905 (33 Stat. 628.16 USC 472)
- Multiple Use-Sustained Yield Act of 1960 (16 USC 528)
- Wilderness Act of 1964 (16 USC 1131-1136)
- Wild and Scenic Rivers Act of 1968 (16 USC 1271 [note], 1271-1287)

In addition to these regulations, other acts, instructional memoranda, manuals, and handbooks give direction and authority to the BLM and USFS. These include the following types of guidance:

- Laws, Regulations, and Orders
- Instruction Memoranda, Information Bulletins, Manuals, Handbooks, and Notes
- Applicable Colorado State Laws and Regulations
- Memoranda and Agreements
- Applicable Planning Documents

The broadly applicable documents that direct the management of public lands for many resources in BCNM are listed in Table 1-2. Resource specific mandates and authorities are listed below.

#### 4.1.1 Federal Regulatory Context

The BLM RMPs and USFS Forest Management Plan must also be consistent with the purposes, policies, and programs of FLPMA and other Federal laws and regulations applicable to public lands, including Federal and State pollution control laws (see 43 CFR 1610.3-2 (a)).

##### 4.1.1.1 Laws, Regulations, and Orders

- 2009 implementation strategy for the Federal Wildland Fire Management Policy
- 43 CFR Part 3 (Preservation of American Antiquities; implementing regulations for the Antiquities Act)
- 43 CFR Part 7 (Protection of Archaeological Resources)

- 1 • 43 CFR Part 10 (Native American Graves Protection and Repatriation Act Regulations;  
2 Final Rule)
- 3 • 36 CFR Part 78 (Waiver of Federal Agency Responsibilities under Section 110 of the  
4 National Historic Preservation Act )
- 5 • 36 CFR 79 (Curation of Federally-Owned and Administered Archeological Collections)
- 6 • 36 CFR Part 60 (National Register of Historic Places)
- 7 • 36 CFR Part 800 (Protection of Historic Properties)
- 8 • American Indian Religious Freedom Act (49 United States Code (U.S.C.) 47125 et  
9 sequens)
- 10 • Antiquities Act of 1906 (P.L. 59-209; 34 Stat. 225; 16 U.S.C. 431 -433)
- 11 • Appropriations Act of 1952, McCarran Amendment
- 12 • Archaeological Resources Protection Act of 1979, as amended (16 U.S.C. 470)
- 13 • Executive Order 11987—Exotic Organisms
- 14 • Executive Order 13007—Indian Sacred Sites
- 15 • Executive Order 13084—Consultation and Coordination with Indian Tribal Governments
- 16 • Federal Cave Resources Protection Act of 1988 (16 U.S.C. 4301 et sequens)
- 17 • Federal Water Pollution Control Act (commonly known as the Clean Water Act), as  
18 amended (33 U.S.C. 1251-1387)
- 19 • Fish and Wildlife Coordination Act (16 U.S.C. 661 et sequens)
- 20 • Historic Sites Act of 1935 (16 U.S.C. 461)
- 21 • Migratory Bird Conservation Act of 1929, as amended (16 U.S.C. 715)
- 22 • National Historic Preservation Act of 1966, as amended (16 U.S.C. 470)
- 23 • Native American Graves Protection and Repatriation Act, as amended (25 U.S.C. 3001 et  
24 sequens)
- 25 • Noise Control Act of 1972 (42 U.S.C. 4901 et sequens)
- 26 • Noxious Weed Control Act of 2004 (Public Law 108-412)
- 27 • Oil and gas onshore orders
- 28 • Onshore Oil and Gas Leasing Reform Act of 1987 (30 U.S.C. 181 et sequens)
- 29 • Recreation and Public Purposes Act of 1926, as amended (43 U.S.C. 869 et sequens)
- 30 • The R&PP Amendment Act of 1988
- 31 • The Sikes Act of 1974, as amended (16 U.S.C. 670 et sequens)
- 32 • Soil and Water Resources Conservation Act of 1977 (16 U.S.C. 2001)
- 33 • Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1201 et sequens)
- 34 • The Common Varieties of Mineral Materials Act of 1947



- 1 • The Mineral Leasing Act of 1920
- 2 • The Mineral Leasing Act for Acquired Lands of 1947
- 3 • The Multiple Use Mining Act of 1955
- 4 • The Organic Administration Act of 1897
- 5 • The United States Mining Laws of 1872
- 6 • 43 CFR (Public Lands, Interior), Parts 2100, 2200, 2300, 2700, 2800, 2900, 3100, 3200,
- 7 3400, 3500, 3600, and 3800
- 8 • Paleontological Resources Preservation Act (16 U.S.C. 473 aaa et sequens)

9 **4.1.1.2 Instruction Memoranda, Information Bulletins, Manuals, Handbooks,**  
10 **Agreements, Land Use Plan Amendments, and Notes**

11 Manuals, Handbooks, Instruction Memoranda, Information Bulletins, Agreements, Land Use  
12 Plan Amendments, and Notes also are in place to guide BLM and USFS land management  
13 decisions and activities. Broadly applicable documents for many resources in BCNM are listed in  
14 Table 1-2. Documents for specific resources are listed below.

- 15 • BLM Manual 1613, Areas of Critical Environmental Concern
- 16 • BLM Manual 1626, Travel and Transportation Management Manual
- 17 • BLM Manual 2881, Mineral Leasing Act—General
- 18 • BLM Manual 3600, Mineral Materials Disposal
- 19 • BLM Manual 3720, Abandoned Mine Land Program Policy
- 20 • BLM Manual 3800, Mining Claims Under the General Mining Laws
- 21 • BLM Manual 6320 – Considering Lands with Wilderness Characteristics in the BLM
- 22 Land Use Planning Process.
- 23 • BLM Manual 6840, Special Status Species Management
- 24 • BLM Manual 7250, Water Rights Manual
- 25 • BLM Manual 7300, Air Resource Management Program
- 26 • BLM Manual 8100, The Foundation for Managing Cultural Resources
- 27 • BLM Manual 8270, Paleontological Resource Management
- 28 • BLM H-1741-1 Fencing
- 29 • BLM H-1741-2 Water Developments
- 30 • BLM H-3042-1, Solid Minerals Reclamation Handbook
- 31 • BLM H-3160-5, Inspection and Enforcement Documentation and Strategy Development
- 32 Handbook
- 33 • BLM H-3600-1, Mineral Materials Disposal Handbook

- 1 • BLM H-3720-1, Abandoned Mine Land Program Policy Handbook
- 2 • BLM H-4110-1 Qualifications & Preference
- 3 • BLM H-4120-1 Grazing Management
- 4 • BLM H-4130-1 Authorizing Grazing Use
- 5 • BLM H-4150-1 Unauthorized Grazing Use
- 6 • BLM H-4160-1 Administrative Remedies
- 7 • BLM H-4400-1 Range Monitoring
- 8 • BLM H-6310-1, Wilderness Inventory and Study Procedures
- 9 • BLM H-8550-1, Interim Management Policy and Guidelines for Lands Under Wilderness
- 10 Review
- 11 • BLM H-9211-1, Fire Planning Handbook
- 12 • BLM H-9214-1, Prescribed Fire Management Handbook
- 13 • BLM policy and program guidance for the management of cultural resources outlined in
- 14 BLM Manual sections 8100, 8110, 8120, H-8120-1, 8130, 8140, 8150, and 8170
- 15 • BLM Colorado Handbook of Guidelines and Procedures for Inventory, Evaluation, and
- 16 Mitigation of Cultural Resources (BLM 2011a)
- 17 • BLM-Colorado Digital Data Specifications Guide (BLM 2013)
- 18 • BLM IB 99-085, Federal Multi-Agency Source Water Agreement
- 19 • BLM IB WO-2002-002, New Heritage Education Plan
- 20 • BLM IB WO-2002-101, Cultural Resource Considerations in Resource Management
- 21 Plans (BLM 2002a)
- 22 • BLM IB WO-2004-154, Amendments to 36 CFR Part 800, Protection of Historic
- 23 Properties
- 24 • BLM IM 2018-014, Third-Party Uses on Railroad Rights-of-Way under the General
- 25 Railroad Right-of-Way Act of March 3, 1875
- 26 • BLM IM 2108-23, Incorporating Thresholds and Responses into Grazing Permits/Leases
- 27 • BLM IM 2017-006, Travel and Transportation Management Planning Schedules and
- 28 Travel and Transportation 5-year Strategy
- 29 • BLM IM 2009-116, Memorandum of Understanding (MOU) between BLM and the
- 30 Animal and Plant Health Inspection Service Addressing the Management of
- 31 Grasshoppers and Mormon Crickets
- 32 • BLM IM 2007-002, BLM Reburial Policy on BLM Lands (BLM 2006)
- 33 • Department of the Interior Departmental Manual. Part 411, Identifying and Managing
- 34 Museum Property (DOI 2012)

- 1 • Interagency Standards for Fire and Fire Aviation Operations (“The Red Book”) (Federal  
2 Fire and Aviation Task Group 2014)
- 3 • National Forest Landscape Management Handbook – Chapter 1 The Visual Management  
4 System (USFS 1974)
- 5 • U.S. Department of Agriculture, Forest Service. National Forest Landscape Management:  
6 Volume 1. Agriculture Handbook 434. Washington, DC: U.S. Department of  
7 Agriculture; 1973.
- 8 • U.S. Department of Agriculture, Forest Service. National Forest Landscape Management:  
9 Volume 2, Chapter 1: "Landscape Aesthetics: A Handbook for Scenery Management."  
10 Agriculture Handbook 701. Washington, DC: U.S. Department of Agriculture; 1996.
- 11 • U.S. Department of Agriculture, Forest Service. National Forest Landscape  
12 Management: Volume 2, Chapter 3: "Range." Agriculture Handbook 484. Washington,  
13 DC: U.S. Department of Agriculture; 1977.
- 14 • U.S. Department of Agriculture, Forest Service. National Forest Landscape Management:  
15 Volume 2, Chapter 4: "Roads." Agriculture Handbook 483. Washington, DC: U.S.  
16 Department of Agriculture; 1977.
- 17 • U.S. Department of Agriculture, Forest Service. National Forest Landscape Management:  
18 Volume 2, Chapter 5: "Timber." Agriculture Handbook 559. Washington, DC: U.S.  
19 Department of Agriculture; 1980.
- 20 • U.S. Department of Agriculture, Forest Service. National Forest Landscape Management:  
21 Volume 2, Chapter 6: "Fire." Agriculture Handbook 608. Washington, DC: U.S.  
22 Department of Agriculture; 1985.
- 23 • U.S. Department of Agriculture, Forest Service. National Forest Landscape Management:  
24 Volume 2, Chapter 8: "Recreation." Agriculture Handbook 666. Washington, DC: U.S.  
25 Department of Agriculture; 1987.

#### 26 **4.1.1.3 Memoranda and Agreements**

27 Broadly applicable Memoranda and Agreements for many resources in BCNM are listed in Table  
28 1-2. Memoranda and Agreements for specific resources are listed below.

- 29 • Interagency Agreement between the Bureau of Reclamation and the BLM (March 1983)
- 30 • MOU on the Coordination and Enhancement of Services to and by the Outfitting Industry  
31 in Colorado on National Forest System, BLM and State Public Lands (2007)
- 32 • MOU Between the Colorado’s Outfitters Association and the USDI, Bureau of Land  
33 Management, Colorado (2006)
- 34 • MOU Between Colorado Mountain Club and the USDI Bureau of Land Management,  
35 Colorado State Office (2008)

- 1 • MOU Between the Colorado Off-Highway Vehicle Coalition and the COHVCO  
2 Foundation and the USDI Bureau of Land Management, Colorado State Office (2005)
- 3 • MOU Between the International Mountain Bicycling Association and Bicycle Colorado  
4 and the USDI Bureau of Land Management, Colorado State Office (2005)
- 5 • MOU Between USDI Bureau of Land Management, Colorado State Office and Colorado  
6 River Outfitters Association and Colorado State Parks (2007)
- 7 • MOU Between USDI Bureau of Land Management and The Access Fund (2005)
- 8 • MOU Between USDI Bureau of Land Management, USDA Forest Service and U.S. Fish  
9 and Wildlife Service and Federal Lands Hunting, Fishing, and Shooting Sports  
10 Roundtable (2006)
- 11 • MOU Between USDI Bureau of Land Management and The Corps Network (2008)
- 12 • State Protocol Agreement Between the Colorado State Director of the Bureau of Land  
13 Management and the Colorado State Historic Preservation Officer, Regarding the Manner  
14 in which the Bureau of Land Management Will Meet Its Responsibilities Under the  
15 National Historic Preservation Act and the 2012 National Programmatic Agreement  
16 Among the BLM, the Advisory Council On Historic Preservation, and the National  
17 Conference of State Historic Preservation Officers
- 18 • MOU with Colorado Cattleman’s Association for the Colorado Resource Monitoring  
19 Initiative (2011)
- 20 • MOU Between BLM and Colorado Natural Areas Program
- 21 • Federal Lands Hunting, Fishing, and Shooting Sports Roundtable MOU

22 **4.1.1.4 Activity Level Plans**

- 23 • Royal Gorge fire management plan(s)
- 24 • AHRA-MP (CPW 2018)

25 **4.1.1.5 Other Policy and Guiding Direction**

- 26 • Recreation Management Guidelines to Meet Public Land Health Standards on Bureau of  
27 Land Management Lands in Colorado (see BLM 2000b)
- 28 • National Management Strategy for Motorized Off-Highway Vehicle Use on Public Lands  
29 (BLM 2001a)
- 30 • National Mountain Biking Strategic Action Plan (BLM 2002c)
- 31 • BLM Recreation Strategy: Connecting with Communities. 2014–2019 (BLM 2014c)
- 32 • Federal Wildland Fire Management Policy and Program Review: Final Report (DOI  
33 AND USDA 1995)
- 34 • Interagency wildland fire use implementation procedures reference guide (2007)

- 1      • Colorado Bark Beetle Strategic Plan 2012 (BLM 2012d)
- 2      • National Materials and Minerals Policy Research and Development Act of 1980

1 **5.0 LIST OF PREPARERS**

Preparer	Discipline	Responsibility
<b>Bureau of Land Management</b>		
Berger, Keith	Field Manager, Royal Gorge Field Office	Responsible Official
Carter, Stephanie	NEPA Reviewer, Resource Specialist	Geology, paleontology, minerals, abandoned mine lands, and public safety
Cook, Forrest	Resource Specialist	Air quality
Elliot, Michelle	Contracting Officer	Contract management
Gilbert, David	NEPA Reviewer, Resource Specialist	Fisheries, hydrology, soils, wetlands/riparian, aquatic biology
Heinlein, Thomas	District Manager, Rocky Mountain District	Responsible Official
Ianella, Amber	NEPA Reviewer, Resource Specialist	Communications, public affairs
Kamke, Catherine	NEPA Reviewer, Resource Specialist	Heritage, cultural resources, tribal consultation
Krickbaum, Bruce	Colorado State Office	
Lamman, John	NEPA Reviewer, Resource Specialist	Invasive species, noxious weeds, range and livestock grazing
Laurence, Marie	Technical Writer, Editor	Technical writer, editor
Lenard, Kalem	NEPA Reviewer, Recreation Manager	Special designations, travel and transportation, visual resources, recreation
Montag, Jessica	NEPA Reviewer, Resource Specialist	Socioeconomics, environmental justice
Pearce, Katie	Contracting Specialist	Contract management
Purnell, Molly	GIS Specialist	GIS
Rogers, Karla	Resource Specialist	Human ecology, social science specialist
Rustand, Matthew	NEPA Reviewer, Resource Specialist	Terrestrial and avian wildlife, special status species
Skinner, Linda	NEPA Reviewer, Resource Specialist	Special designations, travel and transportation, recreation
Smeins, Melissa	NEPA Reviewer, Resource Specialist	Geology, paleontology, minerals, abandoned mine lands, and public safety
Torres, Glenda	NEPA Reviewer, Resource Specialist	Wildland fire ecology, fuels
Troyer, Michael	NEPA Reviewer, Resource Specialist	Heritage, cultural resources, tribal consultation, tribal concerns
Valladares, Gregory	NEPA Reviewer,	Lands and realty

<b>Preparer</b>	<b>Discipline</b>	<b>Responsibility</b>
	Resource Specialist	
Viera, Joseph	Contracting Officer Representative, Project Manager, Resource Specialist	Project management, planning, BLM NCLS program and monument management planning, NEPA reviewer, tribal consultation, climate, ecosystems
Webb, Ty	NEPA Reviewer, Resource Specialist	Fire and fuels
Welch, Ruth	State Director, BLM Colorado	Deciding Official
Williams, Jeffrey	NEPA Reviewer, Resource Specialist	Vegetation, range and livestock grazing
<b>U.S. Forest Service</b>		
Biery, Edward	NEPA Reviewer, Resource Specialist	Forest ecology, vegetation, ecosystems, GIS
Brown, John	NEPA Reviewer, Resource Specialist	Lands and realty
Connely, Erin	Forest Supervisor, PSICC	Deciding Official
Dow, John	USFS Planning, NEPA Reviewer	Planning, climate, ecosystems
Lara, Benjamin	NEPA Reviewer, Resource Specialist	Recreation, wilderness, wilderness study areas, visual
Maestas, Lisa	GIS Specialist	GIS
Ng, Kawa	NEPA Reviewer, Resource Specialist	Socioeconomics, environmental justice
Olson, Steven	NEPA Reviewer, Resource Specialist	Botany, vegetation, threatened and endangered plant species
Pitts, James	District Ranger, Salida Ranger District	Responsible Official
Sanchez, Amanda	NEPA Reviewer, Resource Specialist	Cultural resources
Sanchez, Steven	NEPA Reviewer, Resource Specialist	Hydrology, soils, wetlands and riparian, wild and scenic rivers
Safranek, Angela	NEPA Reviewer, Resource Specialist	Invasive species, rangeland
Shively, Stephanie	NEPA Reviewer, Resource Specialist	Terrestrial and avian wildlife, aquatic biology, fisheries, threatened and endangered wildlife species
Timock, Barbara	NEPA Reviewer,	Communications, public affairs

<b>Preparer</b>	<b>Discipline</b>	<b>Responsibility</b>
	Resource Specialist	
Titterington, Amy	NEPA Reviewer, Resource Specialist	Geology, paleontology
Weierbach, Neal	NEPA Reviewer, Resource Specialist	Special designations, travel and transportation
White, Andrew	NEPA Reviewer, Resource Specialist	Fire and fuels
<b>Colorado Parks and Wildlife/ Arkansas Headwaters Recreation Area</b>		
White, Robert	NEPA Reviewer, Resource Specialist	Cooperating agency lead, recreation, visitor services, public safety
Kreski, John	NEPA Reviewer, Resource Specialist	Recreation, socioeconomics
Michael Atwood	NEPA Reviewer, Resource Specialist	Natural resources
Jim Aragon	NEPA Reviewer, Resource Specialist	Natural resources
<b>Logan Simpson</b>		
Balthrop, Casey	Resource Specialist	Lands proposed for protection of with wilderness characteristics, travel and transportation management
Bibeau, Erin	Resource Specialist	Technical editor
Bockey, Chris	Resource Specialist	Visual resources
Call, Jeremy	Project Manager, Point of Contact, Resource Specialist	Special designations, lands proposed for protection of with wilderness characteristics, rights-of-way and land use authorizations, specific mandates, recreation
Capp, Julie	Resource Specialist	Range and livestock grazing, soils and watersheds
Kachur, Kristina	Project Coordinator Resource Specialist	Recreation, travel and transportation, special designations, administrative record
Keith, Thomas	Senior Technical Advisor	QA/QC
Mascarenas, Terra	NEPA Task Lead, Resource Specialist	Soils and watersheds
Meighen, Bruce	Principal	Contract manager, public and agency coordination
Smith, Casey	Resource Specialist	Travel and transportation
Taylor, Brian	GIS Task Lead	GIS
<b>ICF International</b>		



**LIST OF PREPARERS**

<b>Preparer</b>	<b>Discipline</b>	<b>Responsibility</b>
Allen, James	Resource Specialist	Paleontology
Ayala, Holly	Resource Specialist	Geology, water resources
Bare, Lucas	Resource Specialist Lead	Wildland fire ecology, aquatic wildlife, terrestrial and avian wildlife, special status species sections
Bartlett, Alex	Resource Specialist	Terrestrial vegetation, wetlands and riparian, water resources
Coleman, Randall	Specialist	ePlanning, CommentWorks
Ernst, David	Resource Specialist	Air quality and climate section
Hecht, Jon	Resource Specialist	Social and economic conditions, environmental justice
Johnson, Laura	Resource Specialist	Water resources
Martin, Melanie	MP Task Lead	Planning assessment, alternatives
McCormack, Melanie	Resource Specialist	Aquatic wildlife, terrestrial and avian wildlife, special status species sections
Munaretto, Claire	Resource Specialist	Social and economic conditions, environmental justice
Nally, Dan	Resource Specialist	Geology
Newman, Andrew	Resource Specialist	Aquatic wildlife, terrestrial and avian wildlife, special status species sections
Rabinoff, Alan	Resource Specialist	Geology
Read, Brent	GIS	GIS
Wagoner, Nate	Assistant Project Manager	Project management
Wheaton, Jennifer	Resource Specialist	Paleontology
Ziempke, Laura	Contract Manager	Contract manager
<b>Alpine Archaeological Consultants, Inc.</b>		
Landt, Matthew	Resource Specialist	Cultural resources
Redman, Kimberly	Cultural Resources Lead	Cultural resources, tribal meetings

1

1 **APPENDIX A – ROV TABLE**

**Appendix A - Agency Interpretation of ROVs**

Each paragraph of Proclamation 9232 was analyzed to identify ROVs by resource or resource use.

ROV #	Proclamation 9232, Establishment of BCNM (excerpts)	Resources, Objects, and Values (ROVs)	Air and Climate	Geology & Paleontology	Soils & Watersheds	Water Resources	Vegetation	Wildland Fire	Wetlands	Aquatic Wildlife	Wildlife & Avian	Special Status Species	Cultural Resources	Tribal Concerns	Visual	Recreation	Travel	Range & Livestock	ROW & Land Use	Socio-Economics
ROV 1	In central Colorado's vibrant upper Arkansas River valley, the rugged granite cliffs, colorful rock outcroppings, and stunning mountain vistas of Browns Canyon form an iconic landscape that attracts visitors from around the world. The landscape's canyons, rivers, and backcountry forests have provided a home for humans for over 10,000 years, and the cultural and historical resources found in this landscape are a testament to the area's Native Peoples as well as the history of more recent settlers and mining communities.	Scenic Resources: Colorful rock outcroppings; stunning mountain vistas; Browns Canyon; landscape; canyons; rivers; backcountry forests. Cultural Resources: habitation, historical resources; native peoples; recent settlers; mining communities.		X		X							X	X	X	X				X
ROV 2	The area's unusual geology and roughly 3,000-foot range in elevation support a diversity of plants and wildlife, including a significant herd of bighorn sheep. Browns Canyon harbors a wealth of scientifically significant geological, ecological, riparian, cultural, and historic resources, and is an important area for studies of paleoecology, mineralogy, archaeology, and climate change.	Geology: 3,000-foot range in elevation. Scientific Resources: biodiversity; significant herd of bighorn sheep; scientifically significant geological, ecological, riparian, cultural, and historic resources; important area for studies of paleoecology, mineralogy, archaeology, climate change.	X	X	X		X		X		X	X	X							X
ROV 3	Following its descent between the Sawatch and Mosquito Ranges, the Arkansas River flows through Browns Canyon in the heart of the upper Arkansas River valley. The Arkansas River valley is the northernmost valley in the Río Grande Rift system, one of the most significant rift systems in the world and one of few where the Earth's continental crust is actively moving apart. The 35 million-year-old Río Grande Rift begins in the State of Chihuahua in Mexico and extends northward through New Mexico and into Colorado to a terminus in the mountains just north of Browns Canyon.	Geology: Río Grande rift system		X																

ROV 4	<p>The Browns Canyon area of the upper Arkansas River valley has long offered both a permanent source of water and a means of transportation for its human inhabitants. The area lies within the transition zone between the cultural traditions of the Great Basin and Plains peoples. As a transportation corridor where stable sources of subsistence resources could be found, both migrating people and permanent inhabitants left traces of their presence in this area. Ancestors of the Ute, Apache, Eastern Shoshone, and Comanche Indians are known to have traversed this dramatic landscape while hunting and gathering.</p> <p>The upper Arkansas River valley was foundational to the establishment of today's tribal configuration. It was here that the proto-Comanche (Numuna) split into two groups, the Comanche and the Eastern Shoshone. The Buffalo-Eater Band (allies of the Utes) broke away from the Eastern Shoshone in the upper Arkansas River valley vicinity sometime between the late 1600s and early 1700s, traveling south into what is present-day New Mexico, Texas, southern Colorado, western Kansas, and the panhandle of Oklahoma.</p> <p>While most archaeological resources in the Browns Canyon area have not yet been surveyed or recorded, the story of people living in the upper Arkansas River valley is told through artifacts dating back over 10,000 years. Of the resources surveyed, there are 18 known archaeological sites within the Browns Canyon area, including 5 prehistoric open lithic sites that have been determined to be eligible for the National Register of Historic Places. Primarily seasonal camps, these sites include open campsites, culturally modified trees, wickiups, tipi rings, chipped stone manufacture and processing sites, a possible ceramic pottery kiln, and rock shelter sites that date to the Archaic Period. The sites range from early Archaic Period and possibly Paleo-Indian Period (around 8,000 to 13,000 years before present), which would make this among the earliest known sites in the region, to the Late Archaic Period to proto-historic period (around 3,000 years before present to the 19th century A.D.).</p>	<p>Native and Modern Peoples: Ancestors, Ute, Apache, Eastern Shoshone, proto-Comanche (Numuna) split, Comanche, Eastern Shoshone, and Buffalo-Eater Band; Spanish explorer Juan de Ulibarri; Chaffee County residents and visitors.</p> <p>Cultural Features: Primarily seasonal camps, open campsites, culturally modified trees, wickiups, tipi rings, chipped stone manufacture and processing sites, a possible ceramic pottery kiln, abandoned mine sites, Denver Rio Grande Railroad Bed.</p>		X																	X
ROV 5	<p>Discovery of gold along the Arkansas River in the 1850s and the 1870s silver boom in Leadville brought an influx of people and a need for transportation. In the 1870s, stage roads carried thousands of passengers through this region every year. In the 1880s, after a multi-year legal and armed battle between rival rail companies, the Denver and Río Grande Railway became the major transportation option for the region. The section of railroad bed that runs through Browns Canyon east of the Arkansas River is eligible for listing on the National Register of Historic Places. Even today, this same upper Arkansas River valley remains a major transportation corridor for Chaffee County residents and visitors, as well as an important resource for recreational anglers and boaters, and area ranchers and farmers. Local communities have proposed and conducted a feasibility study for establishing the Arkansas Stage and Rail Trail, which would serve as a testament to this travel corridor's prehistoric and historic significance.</p>	<p>Travel and Transportation: Pre-historic and historic transportation corridor, Arkansas Stage and Rail Trail, access for recreation and ranching.</p>									X			X	X	X					
ROV 6	<p>The 1.6 billion-year-old Precambrian granodiorite batholith that constitutes the Canyon is incised by steep gulches that cut through the pink granite and metamorphic rock. Stafford Gulch provides astounding views of the unique Reef formation, a long and distinctive face of exposed rock. During the Pleistocene Epoch, glaciers covered the rugged canyons, gulches, and mountains that awe visitors today. The movement of these glaciers created unique topographical features in the river valley—including glacial cirques, flat, mesa-like terraces, and remnants of large moraines—that are not found along other major streams in the region. While shaping the topography, the glaciers also filled the valley below with masses of sediment, including the gold, silver, and semi-precious gems that fueled the mining booms of the 1800s. These gems, including the garnets that lend their name to Ruby Mountain in the northern part of the Browns Canyon area, continue to interest professional and amateur geologists.</p>	<p>Geology: Precambrian granodiorite batholith; steep gulches; pink granite; Stafford Gulch; reef formation; glacial cirques; mesa-like terraces; moraines; gold; silver; semi-precious gems; mining booms; and garnets.</p> <p>Recreation: Professional and amateur geologists</p>		X							X										

ROV 7	Portions of the Browns Canyon area offer a relative wealth of Pennsylvanian age geologic exposures of the Minturn formation and Belden shale that include a diverse assemblage of invertebrate fossils. These sites represent the accumulation of shell fossils in an ancient reef environment, and include remains of bivalves, brachiopods, gastropods, echinoids, nautiloids, conodonts, crinoids, bryozoans, and vertebrates including sharks and bony fish. Many of the fossil forms remain undescribed and will form the basis for future paleontological research.	Paleontology: Pennsylvanian exposures; minturn formation; belden formation; invertebrate fossils; shell fossils; ancient reef; bivalves; brachiopods; gastropods; echinoids; nautiloids; conodonts; crinoids; bryozoans; vertebrates; sharks; bony fish; future paleontological research		X		X				X											
ROV 8	The topographic and geologic diversity of the Browns Canyon area has given rise to one of the most significant regions for biodiversity in Colorado. The forest community incorporates a transition zone, with semi-arid pinyon-juniper and mountain mahogany woodlands on the lower slopes giving way to ponderosa pine, Rocky Mountain bristlecone pine, and Douglas fir at higher elevations. Scattered pockets of aspen, willow, Rocky Mountain juniper, river birch, and narrowleaf cottonwood can be found in riparian areas. The Aspen Ridge area is also home to a significant stand of aspen. The understory is home to a variety of plant species, including blue grama grass, mountain muhly, Indian ricegrass, Arizona fescue, blue bunchgrass, prickly pear, cholla, yucca, isolated pockets of alpine bluegrass, and the endemic Brandegee's buckwheat. A stunning array of wildflowers such as the scarlet gilia and larkspur bloom here during the spring and summer. Near Ruby Mountain, imperiled plant species such as Fendler's Townsend-daisy, Fendler's false cloak-fern, livemore fiddleleaf, and the endemic Front-Range alumroot can be found. The plant community in this area has repeatedly evolved during periods of climate change since the Eocene Epoch. Geologic and climatic changes since the Precambrian have made the area an important site for research on geology and paleoecology as well as the effects of climate change, wildland fire, and other disturbances on plant and animal communities.	Vegetation Biodiversity; Forest community; semi-arid pinyon-juniper; mountain mahogany woodlands; ponderosa pine; Rocky Mountain bristlecone pine; aspen; willow; Rocky Mountain juniper; river birch; narrowleaf cottonwood riparian areas Vegetation: Blue grama; Mountain muhly; Indian ricegrass; Arizona fescue; Blue bunchgrass; Prickly pear; Cholla; Yucca; Alpine bluegrass; Brandegee's buckwheat; Scarlet gilia; Larkspur; Fendler's Townsend-daisy; Fendler's false cloak-fern; Livemore fiddleleaf; Front-Range alumroot Research: geology; paleoecology; effects of climate change; wildland fire; disturbances; plant and animal communities.	X	X			X	X	X	X	X	X									
ROV 9	Some of Colorado's most emblematic animal species call Browns Canyon home. Mountain lions, bighorn sheep, mule deer, bobcat, red and gray fox, American black bear, coyote, American pine marten, kangaroo rat, elk, and several species of tree and ground squirrels can all be found in the Browns Canyon area, which provides essential habitat for mammals and birds alike and attracts hunters and wildlife viewers. Raptors such as red-tailed hawks, Swainson's hawks, golden eagles, turkey vultures, and prairie falcons make their homes in the rocky cliffs and prey upon the abundance of small animals that live in this area. The area also provides habitat suitable for peregrine falcons, which have been identified for possible future reintroduction here, as well as potential habitat for the threatened Canada lynx. A stunning diversity of other bird species, including the cliff swallow, Canada jay, mourning dove, flicker, blue jay, wild turkey, great horned owl, western screech owl, and saw whet owl, attract ornithologists and bird enthusiasts alike to these remote hills.	Wildlife: Mountain lions; bighorn sheep; mule deer; bobcat; red fox; gray fox; black bear; coyote; pine marten; kangaroo rat; elk; tree and ground squirrels; canada lynx. Recreation: Hunters; wildlife viewers; bird enthusiasts Raptors: Red-tailed hawks; Swainson's hawks; golden eagles; turkey vultures; prairie falcons; peregrine falcons; Other Avian Species: Cliff swallow; Canada (gray) jay, mourning dove; flicker; blue jay; wild turkey; great horned owl; western screech-owl; and Saw-whet owl.									X	X				X					
ROV 10	A number of reptile and amphibian species occur in the area, including the sensitive boreal toad and northern leopard frog. The Browns Canyon area represents one of the only riparian ecosystems along the Arkansas River that remains relatively undisturbed and contains an intact biotic community.	Aquatic Wildlife: Boreal toad; northern leopard frog. Riparian Resources: riparian areas.						X	X		X										

ROV 11	The protection of the Browns Canyon area will preserve its prehistoric and historic legacy and maintain its diverse array of scientific resources, ensuring that the prehistoric, historic, and scientific values remain for the benefit of all Americans. The area also provides world class river rafting and outdoor recreation opportunities, including hunting, fishing, hiking, camping, mountain biking, and horseback riding.	Recreation: river rafting, hunting, fishing, hiking, camping, mountain biking, and horseback riding.																	X	X				
--------	---	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	---	---	--	--	--	--

Following a statement of ROVs, Proclamation 9232 directs the BLM and USFS to manage the monument and to implement the purposes of this proclamation, pursuant to their respective applicable legal authorities. The remaining paragraphs of the Proclamation were analyzed with respect to resources and resource uses.

Paragr aph	Proclamation 9232, Establishment of BCNM (excerpts)	Air and Climate	Geology & Paleontology	Soils & Watersheds	Water Resources	Vegetation	Wildland Fire	Wetlands	Aquatic Wildlife	Wildlife & Avian	Special Status Species	Cultural Resources	Tribal Concerns	Visual	Recreation	Travel	Range & Livestock	ROW & Land Use	Socio-Economics	
17	All Federal lands and interests in lands within the boundaries described in the accompanying map are hereby appropriated and withdrawn from all forms of entry, location, selection, sale, leasing, or other disposition under the public land laws or laws applicable to the U.S. Forest Service, including 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 monument.		X																X	X
18	The establishment of the monument is subject to valid existing rights. Lands and interests in lands not owned or controlled by the Federal Government within the boundaries described on the accompanying map shall be reserved as a part of the monument, and objects identified above that are situated upon those lands and interests in lands shall be part of the monument, upon acquisition of ownership or control by the Federal Government.		X												X	X			X	X
21	Except for emergency or authorized administrative purposes, motorized and mechanized vehicle use in the monument shall be allowed only on roads and trails designated for such use, consistent with the care and management of the objects identified above. After the date of this proclamation, new roads or trails may only be designated for motorized vehicle use in areas west of the Arkansas River and at the Ruby Mountain Recreation Site and then only as necessary to provide reasonable river or campground access, consistent with the applicable management plan. Forest Road 184 may be realigned or improved only if for the care and management of the objects identified above or as necessary for public safety.														X	X				X
22	Nothing in this proclamation affects or shall be deemed to preclude the Secretaries from reissuing existing authorizations or agreements for the cooperative administration of the Arkansas Headwaters Recreation Area. New or modified authorizations or agreements for such purpose may be issued, consistent with the care and management of the objects identified above. The Secretaries also may authorize and reauthorize commercial recreational services within the monument, including outfitting and guiding, consistent with the care and management of the objects identified above.														X				X	X
23	Nothing in this proclamation shall be deemed to affect the operation or use of the existing railroad corridor as a railroad right of way pursuant to valid existing rights or for recreational purposes consistent with the care and management of the objects identified above.														X	X			X	
24	Nothing in this proclamation shall be deemed to enlarge or diminish the rights of any Indian tribe. The Secretaries shall, to the maximum extent permitted by law and in consultation with Indian tribes, ensure the protection of Indian sacred sites and traditional cultural properties in the monument and provide access by members of Indian tribes for traditional cultural and customary uses, consistent with the American Indian Religious Freedom Act (42 U.S.C. 1996) and Executive Order 13007 of May 24, 1996 (Indian Sacred Sites).											X	X							
25	Laws, regulations, and policies followed by the BLM or the USFS in issuing and administering grazing permits or leases on lands under their jurisdiction shall continue to apply with regard to the lands in the monument, consistent with the care and management of the objects identified above.																	X		X

26	This proclamation does not alter or affect the valid existing water rights of any party, including the United States. This proclamation does not reserve water as a matter of Federal law, and the inclusion of the land underlying the Arkansas River in the monument shall not be construed to reserve such a right. This proclamation does not alter or affect agreements governing the management and administration of Arkansas River flows, including the Voluntary Flow Management Program.			X	X			X	X						X			
27	Nothing in this proclamation shall be deemed to enlarge or diminish the jurisdiction of the State of Colorado, including its jurisdiction and authority with respect to fish and wildlife management.							X	X	X					X			
28	Nothing in this proclamation shall be deemed to revoke any existing withdrawal, reservation, or appropriation; however, the monument shall be the dominant reservation.																X	

In their review of the Proclamation, the BLM/USFS IDT note the following:

ROV #	BLM/USFS IDT Note or Clarification
ROV 2	The elevation range within BCNM is approximately 7,360-10,607 feet. The “3,000-foot range in elevation” may be more accurately described as a 3,250 feet elevation range.
ROV 6	There are no known glacial cirques within BCNM.
ROV 7	The reference to “belden shale” would more be more accurately stated as “belden formation.”
ROV 8	The reference to “Rocky Mountain bristlecone pine” is accurate, and it is noted there is very little bristlecone pine in BCNM. Limber pine is also an important and unique vegetation resource.  The reference to “river birch” would be more accurately described as “water birch.”  There is no known Brandegee's buckwheat habitat (i.e., an appropriate geologic formation) within BCNM. A known population occurs within a mile of the southwest corner of BCNM; future research is necessary to confirm its presence within the monument.
ROV 9	The reference to “red and gray fox” would be more accurately stated as “red fox and gray fox.”  The reference to “American black bear” would be more accurately stated as “black bear.”  The reference to “American pine marten” would be more accurately stated as “pine marten.”  Canada lynx, gray jay and blue jay are unlikely to occur in BCNM.
ROV 10	Boreal toad and northern leopard frog are unlikely to occur at BCNM.

1 **APPENDIX B – SPECIES CONSIDERED FOR U.S.**  
2 **FOREST SERVICE SPECIES OF**  
3 **CONSERVATION CONCERN STATUS**



## Appendix B. Species Considered for U.S. Forest Service Species of Conservation Concern Status

The 2012 Planning Rule (36 CFR 219) and Directives (FSH 1909.12) establish the need for species of conservation concern (SCC). It was established to assure that species remain viable on National Forest System (NFS) lands. The Planning Rule requires the Responsible Official to identify potential SCC and to assess existing information for them in the assessment (36 CFR 219.6 (b)(5)). When SCC are identified the rationale must be given. Identification of SCC is to be based on current conditions in the planning area. All rationale, positive or negative, is to be based on the best available scientific information. They must occur in the planning area and there must be a substantial concern about their capability to persist (remain viable) in the planning area.

As stated in FSH 1909.12.52c:

*If there is insufficient scientific information available to conclude there is a substantial concern about a species' capability to persist in the plan area over the long-term that species cannot be identified as a species of conservation concern.*

*If the species is secure and its continued long-term persistence in the plan area is not at risk based on knowledge of its abundance, distribution, lack of threats to persistence, trends in habitat, or responses to management that species cannot be identified as a species of conservation concern.*

Internal discussions within the Forest Service planning group have proposed interpreting some portions of the FSH 12.52 direction to allow a somewhat greater area of consideration for species. This expands the potential species beyond the Forest boundaries within Browns Canyon National Monument (BCNM). This ensures that species with similar habitats that may be “over the ridge” and could occur on the unit are considered. Also, cumulative effects of projects downstream could impact species outside the Forest. Some consideration is then given to those nearby occurrences.

The Forest Service is relying on the NatureServe ranking system for consistency in determining of species to be considered for SCC status.<sup>1</sup> The NatureServe viability assessments for populations is a reliable aid in determining how well populations are persisting on the landscape.

The initial pool of species to be considered as Species of Conservation Concern (SCC) for the present effort came from the species tracking lists of the Colorado Natural Heritage Program known to occur in the Upper Arkansas Valley and Northern Arkansas Granitics subsections as defined by McNab, et al. (2007). Underlined species have been observed within BCNM.

### **Monarch Butterfly (*Danaus plexippus plexippus*)**

G4T3; CO-S5, KS-S5B

#### **Distribution, abundance, and population trend on the planning unit:**

Monarch Butterfly ranges from British Columbia and Newfoundland south to California, Texas, and Florida. Monarch Butterflies are frequent migrants throughout the Monument. Breeding is probably more localized. It is a long distance migrant that winters in California and Mexico. On 31 December 2014, the USFWS issued a 90-day positive finding on a petition to list Monarch Butterfly under the ESA and will be conducting a full 12-month status review to determine whether protection of this species is warranted across all or a significant portion of its range. On 19 May 2015, the Administration issued its national pollinator strategy for implementation by federal departments and agencies in cooperation with

<sup>1</sup> For details on the definitions of ranks and methodology of their use, see:

<http://explorer.natureserve.org/popviability.htm> and <http://explorer.natureserve.org/eorankguide.htm>

states and other stakeholders in monarch conservation. It recognizes the importance of both the eastern and western populations to maintaining viability of the monarch on the continent and establishes target outcomes to offset and reverse habitat losses. No local trend data are available, and no demographic studies have been done.

**Brief description of natural history and key ecological functions:**

Habitats for Monarch Butterfly are quite diverse, and include forests, woodlands, shrublands, grasslands, cropland, and urban areas. The common factor among breeding habitats is the presence of milkweeds, the larval host plant.

**Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

Monarch Butterfly habitat may be impacted by fuels projects, livestock grazing, pesticide use, and recreation.

**Rationale for analyzing this species as fitting SCC definitions:**

Monarch Butterfly should be considered for status as a SCC. Its life history is well known, and habitat may be impacted by fuels projects, livestock grazing, and recreation. Because of significant population declines over much of the range of Monarch Butterfly, it has a positive 90-day finding on a petition to list the species under ESA. Losses in populations of milkweeds may have had a detrimental effect on this species. Monarchs occur across the Monument as migrants, and probably as a breeding species in small numbers where milkweeds are present. Surveys are needed to clarify the presence and distribution of the species.

**Key literature:**

NatureServe Explorer: An online encyclopedia of life [web application]. 2016. Version 1.6. Arlington, VA, USA: NatureServe. Available: <http://www.natureserve.org/explorer>.

**Susan's Purse-making Caddisfly (*Ochrotrichia susanae*)**

G2; CO-S2

**Distribution, abundance, and population trend on the planning unit:**

Susan's Purse-making Caddisfly is a local endemic known from only two sites in Chaffee County: one on the Salida RD and another on private land near the South Park RD. Records are in the Trout Creek-Arkansas River and High Creek watersheds. The Salida site is about 5.5 miles north of the Monument boundary. Trend data are lacking. There have been no demographic studies done for this species. It was petitioned for listing under ESA in 2009, but was found to not be warranted in 2010.

**Brief description of natural history and key ecological functions:**

Susan's Purse-making Caddisfly has a relatively narrow set of ecological requirements. Water temperatures in the spring habitat are cold and vary little (14.4–15.8°C). Larvae inhabit waters in small streams that are cold, well-oxygenated, highly buffered, and low in trace elements. Stream conditions included extremely high levels of dissolved oxygen (at or near 100% saturation), and high concentrations of dissolved calcium, magnesium, and sulfates. It has been found at elevations of approximately 9,000 feet. Like most caddisflies, the adults are weak fliers, flying only about 1 to 2 meters when disturbed, and tend to remain close to the larval habitat for mating and oviposition.

**Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

Given the documented locations and lack of species information, it is assumed the Monument may contain potential habitat for Susan's Purse-making Caddisfly. Numerous springs and streams occur on the Monument. The caddisfly's distribution may not be completely known due to limited surveys. The

most recent observation is from 2005. Recreational activities, road maintenance and treatments, and inappropriate range management may impact this species and habitat. It may also be susceptible to flooding events.

**Rationale for analyzing this species as fitting SCC definitions:**

Susan's Purse-making Caddisfly should be a SCC because of the presence of at least one known population on the Salida RD less than six miles from the Monument. Given the proximity to documented locations, it is assumed the Monument may contain potential habitat for Susan's Purse-making Caddisfly. Additional surveys for this species are encouraged. It was petitioned for listing under ESA, although found to not be warranted. The ecology of this local endemic species is understood. Populations appear to have low viability, and trends may be declining. Activities associated with range management and recreation could impact this species habitat.

**Key literature:**

Herrmann, S. 2006. Region 2 Sensitive Species evaluation form for *Ochrotrichia susanae*, and supporting documentation.

**Western Bumblebee (*Bombus occidentalis*)**

G4: CO-SNR

**Distribution, abundance, and population trend on the planning unit:**

Western Bumblebee is found from Alaska and Northwest Territories south to California, New Mexico, and Nebraska. The nearest documented occurrence is about six miles north of the Monument boundary. Surveys are needed to determine its distribution more clearly. No local trend data are available, and no demographic studies have been done.

**Brief description of natural history and key ecological functions:**

Western Bumblebees inhabit high elevation areas. They are most frequent in montane and subalpine meadows with abundant and diverse wild flower populations.

**Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

Western Bumblebee is likely to occur on the Monument. Management activities, such as recreation, livestock grazing, pesticide use, and invasive species, may have impacts on this species.

**Rationale for analyzing this species as fitting SCC definitions:**

Western Bumblebee should be considered for status as a SCC. The nearest documented occurrence is about six miles north of the Monument boundary, but is likely to occur. Management activities, such as recreation, livestock grazing, and invasive species management may have impacts on this species. There is evidence that this species populations have declined by as much as 20 percent in recent years. This may be due to introduced parasites, but management activities may also be involved.

**Key literature:**

NatureServe Explorer: An online encyclopedia of life [web application]. 2016. Version 1.6. Arlington, VA, USA: NatureServe. Available: <http://www.natureserve.org/explorer>.

**Bald Eagle (*Haliaeetus leucocephalus*)**

G5; CO-S1B; KS-S2B

**Distribution, abundance, and population trend on the planning unit:**

Bald Eagle ranges throughout North America south to Mexico and the Gulf Coast. Eagles are not known to nest on the Monument, but they regularly occur along the Arkansas River. There is a strong upward

population trend in Colorado when comparing the two breeding bird atlas projects – a 263 percent increase in the new atlas. Bald Eagle had been listed under ESA as a Threatened species, but was delisted in 2007 because recovery goals had been met.

**Brief description of natural history and key ecological functions:**

Bald Eagle is a large, wide-ranging predator frequenting large lakes, reservoirs, and major rivers. Most eagles migrate in summer to northern breeding grounds, returning to lower latitudes during the winter. They consume a wide variety of prey items depending on the season and availability including fish, water birds, and carrion. Breeding Bald Eagles are rare in Colorado, although some nesting does occur near open water including rivers, streams and lakes, nesting and roosting in large ponderosa pine, Douglas-fir, or cottonwood trees in proximity to open water. Mature and open forest structures are considered to be important components of Bald Eagle breeding habitat.

**Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

Bald Eagles are often observed during the winter months along the Arkansas River and other ice-free open water bodies, and in adjacent uplands. Habitat is present on Browns Canyon National Monument. Recreation and fire programs may cause impacts to Bald Eagle.

**Rationale for analyzing this species as fitting SCC definitions:**

Bald Eagle should be considered for status as a SCC. Nesting habitat is present within the Monument, and birds are occasionally seen along the River. Basic components of the species ecology are known. It is found in winter along larger streams and reservoirs. Recreation activities could affect this species. There is a strong upward population trend in Colorado when comparing the two breeding bird atlas projects – a 263 percent increase in the new atlas.

**Key literature:**

U.S. Fish and Wildlife Service. 2007. Endangered and threatened wildlife and plants; removing the Bald Eagle in the lower 48 states from the list of endangered and threatened wildlife. 72 FR 37346-37372. Department of the Interior, Washington, D.C.

U.S. Fish and Wildlife Service. 1999. Endangered and threatened wildlife and plants; proposed rule to remove the Bald Eagle in the lower 48 states from list of endangered and threatened wildlife; proposed rule. Federal Register. 64 36454-36464. Department of the Interior, Washington, D.C.

Mosher, J.A. and J.M. Andrew. 1981. Nesting habitat and nest site selection by the bald eagle in Maryland. Maryland power Plant Siting Program Rep. P55-78-04. Appalachian Environmental Laboratory, Frostburg State College, Frostburg, MD. 41 pgs.

Anthony R.G., R.L. Knight, G.T. Allen, B.R. McClelland, and J.I. Hodges. 1982. Habitat use by nesting and roosting bald eagles in the Pacific Northwest. Trans. N. Am. Wildl. Nat. Resour. Conf. 47:332-342.

Wickersham, L.E., ed. 2016. The second Colorado breeding bird atlas. Colorado Bird Atlas Partnership. Denver, CO. 727 pp.

**Northern Goshawk (*Accipiter gentilis*)**

G5; CO-S3B

**Distribution, abundance, and population trend on the planning unit:**

Northern Goshawk ranges in North America south to California, New Mexico, Wisconsin, and West Virginia. In winter, they may be found south to South Dakota and Iowa. Northern Goshawk has been documented on the Monument, and appears to be regular. However, there has been concern over the last

decade regarding potential decline in species abundance in the western U.S. The 2016 Colorado Breeding Bird Atlas shows a 20 percent decline since the previous edition.

**Brief description of natural history and key ecological functions:**

Northern Goshawk inhabits mixed hardwood and coniferous forests from 7,500 to 11,000 feet in elevation; however, they are found below 7,000 feet in winter and during migration. Locally, they are in Douglas-fir, ponderosa pine, and aspen stands having small openings. They prefer woodlands with intermediate canopy coverage interspersed with fields or wetlands in remote areas. These birds commonly nest in the lower portions of mature Douglas-fir, ponderosa pine, lodgepole pine, or aspen canopies, and prefer old-growth structure. These stands most often have high (60-90 percent) canopy closure with little understory and are often associated with north facing slopes and drainages. The same nest may be used for several seasons. Most nests in Colorado are located on gentle slopes with a north to east aspect on benches or basins surrounded by much steeper slopes. All nest sites in Colorado were located within a quarter mile of openings. Breeding pairs will aggressively defend the nesting territory during incubation and fledging periods. Mature trees serve as perch sites, while plucking posts are frequently located in denser portions of the secondary canopy.

Northern Goshawks hunt for prey in dense woodlands, clearings, and open fields. Goshawks hunt from a perch or while flying through the forest, or pursue prey on the ground, but usually fly low to attack animals by surprise. Prey consists of birds, small mammals, and occasionally insects.

**Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

Breeding Northern Goshawks are sensitive to disturbance during the nesting season. Intrusion into the nest site may cause adult birds to flush from their nest for long periods of time, directly affecting the viability of embryos or nestlings. Modification or destruction of goshawk nesting habitat and human disturbance during nesting represent the greatest threats to this species, and may directly affect nest site use. Extensive fragmentation of habitat by roads, wildfire, insect and disease outbreaks, and increasing human activity may threaten goshawk habitat suitability and quantity.

**Rationale for analyzing this species as fitting SCC definitions:**

Northern Goshawk may be considered for status as a SCC. It has been documented on the Monument. Its life history is well known. Recreation and fire programs may pose threats to Northern Goshawk behavior and distribution. There has been concern over the last decade regarding potential decline in species abundance in the western U.S., although population trends appear stable in Colorado.

**Key literature:**

Squires, J.R. and R.T. Reynolds. 1997. Northern Goshawk (*Accipiter gentilis*). The Birds of North America online (A. Poole, ed.). Ithaca: Cornell Lab of Ornithology. Retrieved from Birds of North America online. <http://bna.birds.cornell.edu/bna/species/298>

Kennedy, P.L. 2003. Northern Goshawk (*Accipiter gentilis atricapillus*): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: [http://www.fs.fed.us/r2/projects/scp/assessments/northern\\_goshawk.pdf](http://www.fs.fed.us/r2/projects/scp/assessments/northern_goshawk.pdf)

Wickersham, L.E., ed. 2016. The second Colorado breeding bird atlas. Colorado Bird Atlas Partnership. Denver, CO. 727 pp.

**Virginia Rail (*Rallus limicola*)**

G5; CO-S4B; KS-S2B

**Distribution, abundance, and population trend on the planning unit:**

Virginia Rail ranges from British Columbia and Quebec south to California, Texas, and Georgia. Birds have been recorded within five miles of the Monument boundary in wetlands near the Arkansas River. No local trend data are available, and no demographic studies have been done. There is some evidence of range-wide declines in population. The 2016 Colorado Breeding Bird Atlas shows a 35 percent increase since the previous edition.

**Brief description of natural history and key ecological functions:**

Virginia Rail breeds in cattail marshes and occasionally in wet meadows, typically with some open water. Nesting is from March through May. There are usually open water areas with emergent vegetation. It is a medium distance migrant.

**Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

There is limited habitat for Virginia Rail within the Monument boundary. It may be affected by actions that lower the local water table. Livestock grazing may be a concern.

**Rationale for analyzing this species as fitting SCC definitions:**

Virginia Rail may be considered for status as a SCC. Birds have been recorded within five miles of the Monument boundary. Basic ecology of the species is known. There is an upward trend in populations. It can be affected by activities that alter the local hydrology.

**Key literature:**

Conway, Courtney J. (1995). Virginia Rail (*Rallus limicola*), The Birds of North America (P. G. Rodewald, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America: <https://birdsna.org/Species-Account/bna/species/virrai>

Cable, T.T., and S. Seltman. 2011. Birds of the Cimarron National Grassland, second edition. USDA, FS, Kansas Experimental Station. Publication 10-390-B. 152 pp.

Wickersham, L.E., ed. 2016. The second Colorado breeding bird atlas. Colorado Bird Atlas Partnership. Denver, CO. 727 pp.

**Long-eared Owl (*Asio otus*)**

G5; CO-S3S4; KS-S2B

**Distribution, abundance, and population trend on the planning unit:**

Long-eared Owl ranges from British Columbia and Quebec south to California, Texas, and North Carolina. It has not been found within Browns Canyon National Monument. No trend data are available, and no demographic studies have been done. The 2016 Colorado Breeding Bird Atlas shows an 89 percent increase since the previous edition.

**Brief description of natural history and key ecological functions:**

Long-eared Owl inhabits dense riparian thickets and Douglas-fir forests, usually near open areas. It is a wide-ranging nocturnal predator, feeding on small mammals.

**Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

Long-eared Owl is a rare resident. There are countless areas having dense vegetation. It may be a somewhat more frequent winter visitor. Because they are usually over-looked, most activities are of little impact to this species. There are some potential impacts from fire projects.

**Rationale for analyzing this species as fitting SCC definitions:**

Long-eared Owl should not be considered for status as a SCC. There are no records of this species within the Monument. Basic ecology of the species is known. It is a rare summer resident, little affected by

management activities. There are some potential impacts from fire projects. No trend or viability information is available.

**Key literature:**

Marks, Jeffrey S., Dave L. Evans and Denver W. Holt. (1994). Long-eared Owl (*Asio otus*), The Birds of North America (P. G. Rodewald, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America: <https://birdsna.org/Species-Account/bna/species/loeowl>

Cable, T.T., and S. Seltman. 2011. Birds of the Cimarron National Grassland, second edition. USDA, FS, Kansas Experimental Station. Publication 10-390-B. 152 pp.

Wickersham, L.E., ed. 2016. The second Colorado breeding bird atlas. Colorado Bird Atlas Partnership. Denver, CO. 727 pp.

**American Peregrine Falcon (*Falco peregrinus anatum*)**

G4T4; CO-S2B; KS-S1B

**Distribution, abundance, and population trend on the planning unit:**

American Peregrine Falcon is found from Alberta to Nova Scotia south to California and Mexico. They winter throughout their range. They have been observed within the Monument boundary, but breeding has not been detected. American Peregrine Falcon was federally listed under the Endangered Species Preservation Act in March 1967. Restrictions on pesticide use as well as implementation of various management acts, including release of approximately 6,000 captive reared falcons, resulted in the attainment of recovery goals and delisting of American Peregrine Falcon on August 25, 1999.

Monitoring results from 2003 indicate that Peregrine Falcon populations are secure and vital. There is a strong upward population trend in Colorado when comparing the two breeding bird atlas projects – a 94 percent increase in the new atlas.

**Brief description of natural history and key ecological functions:**

Breeding pairs of American Peregrine Falcon usually nest on ledges of high cliffs from April through August. Peregrines nest on foothills and mountain cliffs from 4,500 to over 11,000 feet, although most are near the lower end of this range. Piñon-juniper grows in the vicinity of about one-half of all the nest sites and ponderosa pine at about one-quarter of the sites. The typical eyrie has a wide view, plenty of prey availability in the vicinity, is near water, receives little disturbance, has a level site at least 2 feet in diameter, and has a sheltering overhang and some debris for constructing a scrape for the eggs.

**Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

American Peregrine Falcons have been observed on the Monument, which has potential nesting areas that have not been surveyed. Recreational activities near cliffs may impact the distribution of Peregrine Falcon.

**Rationale for analyzing this species as fitting SCC definitions:**

American Peregrine Falcon should be considered for status as a SCC. Basic components of the species ecology are known. It may be affected by recreational activities. It is an infrequent and local nesting species on cliffs and in canyons. They may potentially breed on the cliffs within the Monument. The local trends are increasing.

**Key literature:**

U.S. Fish and Wildlife Service. 1999. Endangered and threatened wildlife and plants; final rule to remove the American Peregrine Falcon from the endangered and threatened wildlife list and to remove the similarity of appearance provision for free-flying peregrines in the conterminous United States. Final

Rule. Federal Register. August 25, 1999. Vol.64, No. 164, pp. 46542-46558. Department of the Interior, Washington, D.C.

U.S. Fish and Wildlife Service. 2006. Endangered and threatened wildlife and plants; post-delisting monitoring results for the American Peregrine Falcon (*Falco peregrinus anatum*), 2003. Federal Register. October 13, 2006. Vol.71, No 198, pg. 60563. Department of the Interior, Washington, D.C.

White, C.M., N.J. Clum, T.J. Cade, and W.G. Hunt. 2002. Peregrine Falcon (*Falco peregrinus*). The Birds of North America online (A. Poole, ed.). Ithaca: Cornell Lab of Ornithology. Retrieved from Birds of North America online. <http://bna.birds.cornell.edu/bna/species/660>

Kingery, H.E. (ed.). 1998. Colorado breeding bird atlas. Colorado Bird Atlas Partnership and Colorado Parks and Wildlife. Colorado Wildlife Heritage Foundation. Denver, Colorado. 636 pgs.

Andrews, R. and R. Righter. 1992. Colorado birds, a reference to their distribution and habitat. Denver Museum of Natural History. Denver, Colorado. 442 pgs.

Wickersham, L.E., ed. 2016. The second Colorado breeding bird atlas. Colorado Bird Atlas Partnership. Denver, CO. 727 pp.

### **Black Swift (*Cypseloides niger*)**

G4; CO-S3B

#### **Distribution, abundance, and population trend on the planning unit:**

Black Swift ranges in North America from British Columbia and Alberta, and in scattered locations south to California, New Mexico, and western Mexico. They winter in South America. There is a nesting colony about 10 miles west of the Monument, so foraging birds could fly over the area. The 2016 Colorado Breeding Bird Atlas shows a 48 percent decline since the previous edition. No local trend data are available, and no demographic studies have been done.

#### **Brief description of natural history and key ecological functions:**

Black Swifts invariably nest on vertical or precipitous cliffs or rock faces near or behind high waterfalls, or in dripping caves. Other than the above requirement, they inhabit a variety of landscapes, from seacoasts to the Rocky Mountains. They forage widely over forests and open areas in the montane zone and the adults typically return to feed the young in the evening. Black Swifts spend most of the daylight hours pursuing aerial insects, often ranging far from nesting areas in search of the abundant but patchy preferred food resources. They sometimes cruise over the summits of 14,000 foot peaks and over croplands 25 miles from nesting colonies. The slow developing nestlings fledge much later (45-49 days) than most other swift species and are still on the nest well into September. Winter habitats are unknown.

#### **Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

Black Swift nesting has been documented on the Salida RD in the Chalk Creek watershed. Altered hydrology impacting water flow near nests may cause conditions to become unfavorable for the birds. Swifts could forage over the Monument.

#### **Rationale for analyzing this species as fitting SCC definitions:**

Black Swift may be considered for status as a SCC. Some is known about the species ecology, but there is no trend or viability information available. There are a few areas where swifts may be found foraging over the Monument.

#### **Key literature:**



Lowther, P.E., and C.T. Collins. 2002. Black Swift (*Cypseloides niger*). The Birds of North America online (A. Poole, ed.). Ithaca: Cornell Lab of Ornithology. Retrieved from Birds of North America online. <http://bna.birds.cornell.edu/bna/species/676>

Wiggins, D. (2004, January 26). Black Swift (*Cypseloides niger*): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/blackswift.pdf>

Wickersham, L.E., ed. 2016. The second Colorado breeding bird atlas. Colorado Bird Atlas Partnership. Denver, CO. 727 pp.

### **Lewis's Woodpecker (*Melanerpes lewis*)**

G4; CO-S4, KS-SNA

#### **Distribution, abundance, and population trend on the planning unit:**

Lewis's Woodpecker ranges from southern British Columbia and South Dakota south to California and Oklahoma panhandle. It can be local and sporadic within this range. It winters from southwestern Oregon and eastern Colorado south to Mexico. Habitat is present on Browns Canyon National Monument. It is seen regularly and may breed in the Monument. The 2016 Colorado Breeding Bird Atlas shows a 47 percent decline since the previous edition.

#### **Brief description of natural history and key ecological functions:**

Lewis's Woodpecker occurs in open canopied stands with brushy understories and abundant downed woody material. It prefers ponderosa pine woodlands, burnt-over areas with abundant snags and stumps, riparian and rural cottonwoods, and piñon-juniper woodlands. Their elevation preferences appear to be between 3,500 and 7,000 feet. They nest in cavities, often in holes created by other woodpeckers. During the breeding season, they feed almost exclusively on emergent insects versus grubs, unlike other woodpeckers. In winter they are found in small, nomadic flocks oak woodlands, orchards, and cottonwood groves.

#### **Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

Lewis's Woodpeckers are year round residents in ponderosa pine woodlands with open understories. Fuels reduction projects and recreation activities may impact the distribution of Lewis's Woodpecker. Livestock grazing may improve habitat conditions by maintaining the open condition of woodlands and increasing insect diversity.

#### **Rationale for analyzing this species as fitting SCC definitions:**

Lewis's Woodpecker should be considered for status as a SCC. Woodpeckers are seen regularly and may breed in the Monument. Its biology is well known. Fuels reduction projects and recreation activities may impact the distribution and behavior of Lewis's Woodpecker. There is a range-wide decline in this species numbers.

#### **Key literature:**

Vierling, K.T., V.A. Saab, and B.W. Tobalske. 2013. Lewis's Woodpecker (*Melanerpes lewis*). The Birds of North America online (A. Poole, ed.). Ithaca: Cornell Lab of Ornithology. Retrieved from Birds of North America online. <http://bna.birds.cornell.edu/bna/species/284>

Abele, S.C., V.A. Saab, and E.O. Garton. 2004. Lewis's Woodpecker (*Melanerpes lewis*): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/lewisswoodpecker.pdf>

Wickersham, L.E., ed. 2016. The second Colorado breeding bird atlas. Colorado Bird Atlas Partnership. Denver, CO. 727 pp.

**Olive-sided Flycatcher (*Contopus cooperi*)**

G4; CO-S3S4B, KS-SNA

**Distribution, abundance, and population trend on the planning unit:**

Olive-sided Flycatcher ranges from Alaska and Newfoundland south to California, New Mexico, Minnesota, and Massachusetts. There are outlying populations in the Guadalupe Mountains of Texas, eastern West Virginia, and eastern Tennessee. It winters in central and South America. Birds are seen in the Monument and may breed here in the summer. The 2016 Colorado Breeding Bird Atlas shows an 18 percent decline since the previous edition.

**Brief description of natural history and key ecological functions:**

In Colorado, Olive-sided Flycatcher is a breeding mountain resident nesting at elevations to 10,000 feet. It is associated with montane coniferous forests, especially spruce-fir stands. It is associated with openings and open forests having snags. These are often near streams and burned forests. They are frequently associated with openings following natural and anthropogenic disturbances, such as tree fall gaps and fire. They normally forage from dead perches where the visibility of flying insects is better and aerial maneuvers are easier. These birds consume almost exclusively flying insects, such as bees, flies, moths, grasshoppers, and dragonflies. This flycatcher is a passive searcher, foraging primarily by sallying, concentrating on prey available via aerial attack. They prefer to nest high up in the conifers where their larger body size is well hidden.

**Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

Olive-sided Flycatchers have been documented on the Monument and may breed. Populations are threatened by activities on the species winter range. Fire management activities may impact Olive-sided Flycatcher.

**Rationale for analyzing this species as fitting SCC definitions:**

Olive-sided Flycatcher may be considered for status as a SCC. They have been documented on the Monument and may nest. Its ecology is well known. There are range-wide declines in populations, but trends are stable in Colorado. Fire management activities may impact Olive-sided Flycatcher.

**Key literature:**

Altman, B., and R. Sallabanks. 2012. Olive-sided Flycatcher (*Contopus cooperi*). The Birds of North America online (A. Poole, ed.). Ithaca: Cornell Lab of Ornithology. Retrieved from Birds of North America online. <http://bna.birds.cornell.edu/bna/species/502>

Kotliar, N.B. (2007, February 20). Olive-sided Flycatcher (*Contopus cooperi*): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/olivesidedflycatcher.pdf>

Wickersham, L.E., ed. 2016. The second Colorado breeding bird atlas. Colorado Bird Atlas Partnership. Denver, CO. 727 pp.

**Loggerhead Shrike (*Lanius ludovicianus*)**

G4; CO-S3S4B; KS-S4B

**Distribution, abundance, and population trend on the planning unit:**

Loggerhead Shrike ranges from Alberta to Quebec south to California, Texas and central Mexico, and Florida. It winters from California, western Missouri and Virginia south to central Mexico. It is occasionally seen within the Monument boundary. The 2016 Colorado Breeding Bird Atlas shows an 8 percent decline since the previous edition.

**Brief description of natural history and key ecological functions:**

Loggerhead Shrikes inhabit open areas with short vegetation, fence rows, orchards, and open woodlands. Most activity occurs near isolated trees and shrubs. Loggerhead Shrike is often in open habitats with trees less than 15 feet for nesting. Shrikes eat mostly insects, but vertebrates, such as birds, lizards, frogs, and toads, also make up a significant portion of their diet. Shrikes are found to have breeding sites at elevations ranging from below 4,000 feet to possibly as high as 8,900 feet. There are no confirmed breeding records in the mountain parks or mountains.

**Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

Loggerhead Shrike may be threatened by habitat loss and conversion, pesticide use, range, and recreation. Habitat may be present on Browns Canyon National Monument. Range management and prescribed fire programs may impact this species.

**Rationale for analyzing this species as fitting SCC definitions:**

Loggerhead Shrike may be considered for status as a SCC. Shrikes are not known to breed in the Monument, but occasionally appear as visitors. Its ecology is well known. There are range-wide declines in populations, but trends are stable in Colorado. Range management and prescribed fire programs may impact this species.

**Key literature:**

Reuven, Y. 1996. Loggerhead Shrike (*Lanius ludovicianus*). The Birds of North America online (A. Poole, ed.). Ithaca: Cornell Lab of Ornithology. Retrieved from Birds of North America online. <http://bna.birds.cornell.edu/bna/species/231>

Wiggins, D. (2005, February 10). Loggerhead Shrike (*Lanius ludovicianus*): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/loggerheadshrike.pdf>

Wickersham, L.E., ed. 2016. The second Colorado breeding bird atlas. Colorado Bird Atlas Partnership. Denver, CO. 727 pp.

**Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*)**

G5; CO-S5; KS-S2B

**Distribution, abundance, and population trend on the planning unit:**

Yellow-headed Blackbird ranges from British Columbia and Ontario south to California, Texas, and Illinois. There are no documented occurrences of this species on the Monument, but there are records within five miles along the Arkansas River. No local trend data are available, and no demographic studies have been done. The 2016 Colorado Breeding Bird Atlas shows a 4 percent decline since the previous edition.

**Brief description of natural history and key ecological functions:**

Yellow-headed Blackbird breeds in large cattail marshes having areas of open water, mostly below 7,500 feet elevation. Nesting is typically in dense colonies. It feeds primarily on aquatic insects during the summer and grain in the winter. It is a short distance migrant.

**Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

There is limited breeding habitat for Yellow-headed Blackbird within Browns Canyon. Threats to the species may include loss of wetlands and altered hydrology.

**Rationale for analyzing this species as fitting SCC definitions:**

Yellow-headed Blackbird may be considered for status as a SCC. There are no documented occurrences of this species on the Monument, but there are records within five miles along the Arkansas River. Basic ecology of the species is known. Some recreational activities and projects that alter the local hydrology could affect this species. No trend information is available, but populations have good viability.

**Key literature:**

Twedt, Daniel J. and Richard D. Crawford. (1995). Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*), The Birds of North America (P. G. Rodewald, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America: <https://birdsna.org/Species-Account/bna/species/yehbla>

Cable, T.T., and S. Seltman. 2011. Birds of the Cimarron National Grassland, second edition. USDA, FS, Kansas Experimental Station. Publication 10-390-B. 152 pp.

Wickersham, L.E., ed. 2016. The second Colorado breeding bird atlas. Colorado Bird Atlas Partnership. Denver, CO. 727 pp.

**Gunnison's Prairie Dog (*Cynomys gunnisoni*)**

G5T2; CO-S2

**Distribution, abundance, and population trend on the planning unit:**

Gunnison's Prairie Dog is found in Arizona, Colorado, New Mexico, and Utah. A portion of one colony extends onto Browns Canyon National Monument. Trend data are lacking, but numbers appear to be stable. Gunnison's Prairie Dog had been considered for listing under ESA, but was found not to be warranted due to the number of additional populations found across its range.

**Brief description of natural history and key ecological functions:**

Gunnison's Prairie Dog is found in mesic plateaus, mountain valleys, and lowlands. They inhabit a range in elevation from 6,000 to 12,000 feet. They are colonial rodents that inhabit grasslands and semi-desert and montane shrublands. The animals are diurnal, with bimodal peaks of activity common during the warmer parts of the year. They hibernate during the winter. In central Colorado, individuals enter burrows by October and emerge in mid-April. Hibernation periods are shorter at lower elevations and some individuals may even appear above ground in the winter months.

**Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

A Gunnison's Prairie Dog population is present on Browns Canyon National Monument. Recreation and range programs may impact Gunnison's Prairie Dog.

**Rationale for analyzing this species as fitting SCC definitions):**

Gunnison's Prairie Dog may be considered for status as a SCC because it is present on Browns Canyon National Monument. The ecology of this species is well known. Populations are generally on a slight upward trend and have good viability. Activities that may affect this species include range management and recreation.

**Key literature:**

Fitzgerald, J.P., C.A. Meaney, and D.M. Armstrong. 1994. Mammals of Colorado. Den. Mus. Nat. Hist., Univ. Press Colo. 467pp.

Knowles, C. 2002. Status of white-tailed and Gunnison's prairie dogs. National Wildlife Federation, Missoula, MT and Environmental Defense, Washington DC. 30 pgs.

U.S. Fish and Wildlife Service. 2013. 12 month finding on a petition to list Gunnison's prairie dog as an Endangered or Threatened species. 78 FR 68660-68685. Department of the Interior, Washington, D.C.

### **American Hog-nosed Skunk (*Conepatus leuconotus*)**

G4; CO-S1

#### **Distribution, abundance, and population trend on the planning unit:**

American Hog-nosed Skunk ranges from Colorado south to Arizona and Texas. It is not known to occur on the Monument. No local trend data are available, and no demographic studies have been done.

#### **Brief description of natural history and key ecological functions:**

American Hog-nosed Skunk is omnivorous, consuming insects, small mammals and reptiles, fruits, berries, and nuts. They are primarily nocturnal. Colorado records are from canyon lands, most frequently near piñon stands. Hog-nosed Skunks use rocky ledges, caves, abandoned mines, abandoned burrows, woodrat nests, and similar sites for denning. They seem to spend a large portion of their time rooting for insects with the snout and long front claws.

#### **Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

Confirmed Hog-nosed Skunk records are on the Salida RD. It was located in ponderosa pine/oak brush woodlands with rock outcroppings and rimrock. Fuels reduction projects and recreation programs may impact American Hog-nosed Skunk.

#### **Rationale for analyzing this species as fitting SCC definitions:**

American Hog-nosed Skunk should not be considered for status as a SCC. It is not known to occur within the Monument. There are likely to be few impacts from management activities. Basic components of the species ecology are known. No trend or viability information is available.

#### **Key literature:**

Fitzgerald, J.P., C.A. Meaney, and D.M. Armstrong. 1994. Mammals of Colorado. Den. Mus. Nat. Hist., Univ. Press Colo. 467pp.

Armstrong, D.M. 1972. Distribution of mammals in Colorado. Univ. of Kansas Printing Service. Lawrence, KS. 415 pgs.

Meaney, C.A., A.K. Ruggles, and G.P. Beauvais. 2006. American Hog-nosed Skunk (*Conepatus leuconotus*): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/americanhognosedskunk.pdf>

### **Hoary Bat (*Lasiurus cinereus*)**

G5; CO-S5B, KS-SNA

#### **Distribution, abundance, and population trend on the planning unit:**

Hoary Bat ranges from the Northwest Territories and Quebec south to California, Texas, and Florida. Winter range is unknown. Hoary Bats are migratory and may travel from Canada to the southern portion of the U.S. and into Mexico. They have been found within the Monument boundary. Hoary Bat was added to the RFSS list in response to recent and rapid changes due to the influence of the bark beetle on forested habitat used by Hoary Bat. No trend data are available, and no demographic studies have been done.

**Brief description of natural history and key ecological functions:**

Hoary Bat is a solitary and wide-ranging species. Hoary Bat probably occurs throughout Colorado in suitable habitat from the plains to elevations of 10,000 feet in the mountains. They use a variety of trees as roost sites. They appear to favor deciduous trees such as cottonwoods. They are frequently detected in Douglas-fir and ponderosa forests where large deciduous trees are lacking. Roosts are located 13 to 16 feet above the ground, protected from above with leaf cover and branches, while allowing a clear flight path from below. Such trees are frequently associated with margins of clearings or with windbreaks of the narrow fringe of deciduous trees along streams. They emerge late in the evening. Hoary Bats never seem to be abundant in any area, except for when small groups are encountered in migration. Their diet consists primarily of moths, but also includes beetles, flies, grasshoppers, dragonflies, and wasps.

**Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

Hoary Bat is present on the Monument. Fire management activities may impact Hoary Bat.

**Rationale for analyzing this species as fitting SCC definitions:**

Hoary Bat may be considered for status as a SCC. They have been found within the Monument boundary. Some is known about the species ecology, but there is no local trend or viability information available. It was added to the RFSS list in response to recent and rapid changes due to the influence of the bark beetle on forested habitat used by Hoary Bat. Fire management activities may impact Hoary Bat.

**Key literature:**

NatureServe Explorer: An online encyclopedia of life [web application]. 2016. Version 1.6. Arlington, VA, USA: NatureServe. Available: <http://www.natureserve.org/explorer>.

Fitzgerald, J.P., C.A. Meaney, and D.M. Armstrong. 1994. Mammals of Colorado. Den. Mus. Nat. Hist., Univ. Press Colo. 467pp.

Adams, R.A. 2003. Bats of the Rocky Mountain West: natural history, ecology, and conservation. University Press of Colorado. Boulder, Colorado. Pp. 160-166.

**Townsend's Big-eared Bat (*Corynorhinus townsendii pallescens*)**

= *Plecotus townsendii pallescens*

G3G4T3T4; CO-S2; KS-S2

**Distribution, abundance, and population trend on the planning unit:**

Townsend's Big-eared Bat ranges from British Columbia, and South Dakota south to California and Texas. There are no records on the Monument. No trend data are available, and no demographic studies have been done.

**Brief description of natural history and key ecological functions:**

Townsend's Big-eared Bats are found in a variety of vegetation types, but have specific roosting and hibernating requirements. Most accounts of their habitat focus on the requirement for suitable roosts including caves, mines, and rocky ledges and overhangs. It has been reported to use basal hollows of old-growth trees and is common in mesic habitats with coniferous and deciduous forests. In Colorado, this bat inhabits the rough, "broken country" vegetation typical of brush or open woodland at elevations up to 9,500 feet. Edge habitat seems to be used by some big-eared bats, primarily because it may be easier for them to feed where there are fewer branches to avoid while pursuing prey. These bats also glean insects from leaves, with a majority of their foraging occurring over water. Townsend's Big-eared Bats are extremely sensitive to roost disturbance, including loud noise.

**Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

Recreation and fire programs may impact Townsend's Big-eared Bat. The PSICC has a diversity of potential habitats for this species, and there are numerous records scattered across the unit.

**Rationale for analyzing this species as fitting SCC definitions:**

Townsend's Big-eared Bat may be considered for status as a SCC. There are no records on the Monument. Its ecology is fairly well understood. Activities that may impact this species include recreation, fire, and mining. No trend or viability information is available. Species specific surveys should be encouraged prior to determination as a SCC.

**Key literature:**

Schmidt, C.A. 2003. Conservation assessment for the Townsend's big-eared bat in the Black Hills National Forest, South Dakota and Wyoming. U.S. Forest Service, Rocky Mountain Region. Custer, SD. 23 pp.

Fitzgerald, J.P., C.A. Meaney, and D.M. Armstrong. 1994. Mammals of Colorado. Den. Mus. Nat. Hist., Univ. Press Colo. 467pp.

Gruver, J.C. and D.A. Keinath. 2006. Townsend's Big-eared Bat (*Corynorhinus townsendii pallescens*): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/townsendbiggearedbat.pdf>

**Brazilian Free-tailed Bat (*Tadarida brasiliensis*)**

G5; CO-S1

**Distribution, abundance, and population trend on the planning unit:**

Brazilian Free-tailed Bat ranges from Oregon, Nebraska, and South Carolina south into Mexico. This species is migratory. There are no records on the Monument. No trend data are available, and no demographic studies have been done.

**Brief description of natural history and key ecological functions:**

Brazilian Free-tailed Bat occurs in piñon-juniper grasslands and shrublands. It roosts in caves and crevices. Young are born in June and July.

**Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

Habitat for Brazilian Free-tailed Bat is widespread. Fire and disease in juniper stands may affect this species. Another potential threat to Brazilian Free-tailed Bat is the use of insecticides.

**Rationale for analyzing this species as fitting SCC definitions:**

Brazilian Free-tailed Bat may be considered for status as a SCC. There are no records on the Monument. There are potential impacts to Brazilian Free-tailed Bat from fuels reduction projects. Basic components of the species ecology are known. No trend or viability information is available. Species specific surveys should be encouraged prior to determination as a SCC.

**Key literature:**

Fitzgerald, J.P., C.A. Meaney, and D.M. Armstrong. 1994. Mammals of Colorado. Den. Mus. Nat. Hist., Univ. Press Colo. 467pp.

**Rocky Mountain Bighorn Sheep (*Ovis canadensis canadensis*)**

G4T4; CO-S4

**Distribution, abundance, and population trend on the planning unit:**

Rocky Mountain Bighorn Sheep are distributed throughout the mountainous regions of western North America from British Columbia and Alberta south to northern New Mexico and central Arizona. It is known to occur within the Monument boundary. No local trend data are available, and no demographic studies have been done.

**Brief description of natural history and key ecological functions:**

Rocky Mountain Bighorn Sheep occurs in open or semi-open terrain characterized by a mix of steep or gentle slopes, broken cliffs, rock outcrops, and canyons and their adjacent river benches and mesa tops. They are primarily animals of open habitats, such as alpine meadows, open grasslands, shrub-steppe, talus slopes, rock outcrops, and cliffs. In some places, they may use areas of deciduous and conifer forests, especially where openings may have been created by clear-cuts or fire. Densely forested areas are rarely used by bighorns, except for shade in summer, escape from insects, and protection from high winds on very cold days.

Visibility is an important habitat variable for Bighorn Sheep, so the structure and height of vegetation is important. While Bighorns feed in open areas, they are rarely found more than 400 meters from escape cover, where they have an advantage over most predators. Talus slopes, rock outcrops, and cliffs provide habitat for resting, lambing, and escape cover.

Rocky Mountain Bighorn Sheep are gregarious and spend much of their life in groups, therefore transmission of diseases and parasites are important factors. Disease is probably the most important limiting factor, often causing large and sudden population declines. Major population declines have occurred in North America, often resulting from contact with domestic sheep and environmental stress. Factors other than disease that influence mortality rates in bighorns may include inclement weather, inbreeding depression, poor maternal condition, poor mothering skills, human disturbance, and predators.

**Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

The San Carlos RD has been identified as a “low risk area of extirpation” for Rocky Mountain Bighorn Sheep in Colorado due to relatively large herd sizes, and fairly good connective corridors and vegetation conditions. Conversely, the northern portion of the Forest including northeastern Salida RD have been identified as having a “high risk of extirpation” due to the presence of domestic sheep grazing allotments, and poor connectivity between several small herds.

**Rationale for analyzing this species as fitting SCC definitions:**

Rocky Mountain Bighorn Sheep should be considered for status as a SCC. It has been documented on Browns Canyon National Monument. Range and recreation programs may impact Rocky Mountain Bighorn Sheep. Disease is probably the most important limiting factor, often causing sudden population declines, often resulting from contact with domestic sheep and environmental stress.

**Key literature:**

NatureServe Explorer: An online encyclopedia of life [web application]. 2016. Version 1.6. Arlington, VA, USA: NatureServe. Available: <http://www.natureserve.org/explorer>.

Beecham, J.J. Jr., C.P. Collins, and T.D Reynolds. 2007. Rocky Mountain bighorn sheep (*Ovis canadensis*): A technical conservation assessment. [On-line] U.S. Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments>

Fitzgerald, J.P., C.A. Meaney, and D.M. Armstrong. 1994. Mammals of Colorado. Den. Mus. Nat. Hist., Univ. Press Colo. 467pp.

**Fendler’s Cloak-fern (*Argyrosma fendleri*)**

---



G3; CO-S3

**Distribution, abundance, and population trend on the planning unit:**

Fendler's Cloak-fern ranges from Wyoming south to Sonora, Mexico. There are a few small populations within the Monument boundary. No local trend data are available, and no demographic studies have been done.

**Brief description of natural history and key ecological functions:**

Fendler's Cloak-fern is a perennial herb that occurs in arid canyons. It is found on cliffs and crevices in ponderosa pine and piñon-juniper woodlands, and oak shrublands. It is often on volcanic or granitic rocks. Soils are developed in residuum. Its elevation range is from 4,800 to 9,500 feet. Sporulation is in summer and fall. Spores are wind dispersed. There is no information on diversity within the community.

**Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

Fendler's Cloak-fern has known populations and arid cliff and canyon habitat. It has a minimal threat from unregulated recreation and fire activities.

**Rationale for analyzing this species as fitting SCC definitions:**

Fendler's Cloak-fern may be considered for status as a SCC. It is known to occur within the Monument boundary. Its ecology is fairly well understood. Populations are described as having good viability. No trend information is available. It may be impacted by unregulated recreation and fire activities.

**Key literature:**

NatureServe Explorer: An online encyclopedia of life [web application]. 2016. Version 1.6. Arlington, VA, USA: NatureServe. Available: <http://www.natureserve.org/explorer>

Colorado Natural Heritage Program. 1997+. Colorado Rare Plant Guide. [www.cnhp.colostate.edu](http://www.cnhp.colostate.edu). Latest update: June 30, 2014.

**Pale Blue-eyed Grass (*Sisyrinchium pallidum*)**

G3; CO-S2

**Distribution, abundance, and population trend on the planning unit:**

Pale Blue-eyed Grass is known from Colorado and Wyoming. It is a regional endemic species known to occur within the Monument boundary. No local trend data are available, and no demographic studies have been done.

**Brief description of natural history and key ecological functions:**

Pale Blue-eyed Grass is a perennial herb found in wet meadows and along stream and lake margins at elevations from 6,300 to 9,700 feet from the foothills to subalpine. Soils are often alkaline, developed in alluvium, colluvium, and residuum. Flowers appear from June to August. Seed is probably spread by wind, water, and animals. Ecology and demography are not well known. There is no information on diversity within the community.

**Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

Threats to Pale Blue-eyed Grass are altered hydrology, drought, and over-grazing in wet meadows. Habitat is locally distributed on the Monument.

**Rationale for analyzing this species as fitting SCC definitions:**

Pale Blue-eyed Grass should be considered for status as a SCC. It is a regional endemic species known to occur within the Monument boundary. Its ecology is fairly well understood. It may be impacted by

activities associated with unregulated recreation and grazing. No local trend or viability information is available. Surveys for this species are suggested prior to determination as a SCC.

**Key literature:**

NatureServe Explorer: An online encyclopedia of life [web application]. 2016. Version 1.6. Arlington, VA, USA: NatureServe. Available: <http://www.natureserve.org/explorer>

Colorado Natural Heritage Program. 1997+. Colorado Rare Plant Guide. [www.cnhp.colostate.edu](http://www.cnhp.colostate.edu). Latest update: June 30, 2014.

**Lesser Yellow Lady's-slipper (*Cypripedium parviflorum*)**

= *Cypripedium calceolus*, *C. calceolus* ssp. *pubescens*, *C. parviflorum* var. *pubescens*, *C. pubescens* var. *mokasin*; Yellow Lady's-slipper, American Yellow Lady's-slipper  
G5; CO-S2; KS-SNR

**Distribution, abundance, and population trend on the planning unit:**

Lesser Yellow Lady's-slipper is widespread in North America, growing in Alaska and Canada as well as most of the northern and eastern states. It reaches its southern Rocky Mountain distribution in Colorado. There are no records on the Monument. No local trend data are available, and no demographic studies have been done.

**Brief description of natural history and key ecological functions:**

Lesser Yellow Lady's-slipper is a perennial herb that inhabits subalpine wetlands as well as a wide variety of habitats in the lower montane zone including aspen groves and moist ponderosa pine-Douglas-fir forests. Soils may be derived from gravels and residuum from granitic rocks. It occurs at elevations from 6,000 to 9,500 feet. It flowers from May to July and fruits from June to August. Seeds are probably dispersed by the wind. Wetland indicator status for this species has been rated as FACW.

**Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

Although widespread, it is uncommon in most of its range, and populations are widely scattered in moist forests in Colorado where the species is known at a narrow elevation range of 6,000 to 9,600 feet. Threats include over-collecting, livestock grazing, fire suppression, unregulated recreation, invasive species, and habitat conversion.

**Rationale for analyzing this species as fitting SCC definitions:**

Lesser Yellow Lady's-slipper should not be considered for status as a SCC. There are no records on the Monument. Basic ecology of the species is known. Unregulated recreation and invasive species and their management could impact this species. It is listed in the CITES Appendix II list, restricting international trade.

**Key literature:**

Mergen, D.E. 2006. *Cypripedium parviflorum* Salisb. (Lesser yellow lady's slipper): a technical conservation assessment. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/cypripediumparviflorum.pdf>

Lichvar, R.W. 2012. The national wetland plant list. ERDC/CRREL TR-12-11. Hanover, NH: U.S. Army Corps of Engineers, Cold Regions Research and Engineering Laboratory. [http://acwc.sdp.sirsi.net/client/search/asset?t:ac=\\$N/1012381](http://acwc.sdp.sirsi.net/client/search/asset?t:ac=$N/1012381)

NatureServe Explorer: An online encyclopedia of life [web application]. 2016. Version 1.6. Arlington, VA, USA: NatureServe. Available: <http://www.natureserve.org/explorer>.

Flora of North America Editorial Committee, eds. 1993+. Flora of North America North of Mexico. 20+ vols. New York and Oxford.

**Lesser Panicked Sedge (*Carex diandra*)**

G5; CO-S1

**Distribution, abundance, and population trend on the planning unit:**

Lesser Panicked Sedge is circumboreal, ranging across the northern half of the U.S. and reaching its southernmost Rocky Mountain distribution in Colorado. There is one record about 0.25 miles to the east of the Salida RD. There are no records on the Monument. No trend data are available, and no demographic studies have been done.

**Brief description of natural history and key ecological functions:**

Lesser Panicked Sedge is a perennial graminoid that inhabits montane to subalpine willow carrs and rich fens, and produces flowers and fruit from June to August. Seeds are dispersed by wind, water, and animals. This species may also form floating sedge mats on the margins of ponds. It is found at elevations ranging from 7,000 to 10,000 feet. Wetland indicator status for this species has been rated as OBL. There is no information on diversity within the community.

**Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

Populations of Lesser Panicked Sedge in the state are at the southern extreme of the species range. The Monument has limited willow carr habitat. Threats may include altered hydrology and road construction.

**Rationale for analyzing this species as fitting SCC definitions:**

Lesser Panicked Sedge may be considered for status as a SCC. There are records in the general vicinity and habitat is present. There are no records on the Monument. Basic components of the species ecology are known. Activities that alter local hydrology could affect this species. No local trend or viability information is available. Surveys for Lesser Panicked Sedge may be appropriate prior to determination as a SCC.

**Key literature:**

Gage, E. and D.J. Cooper. 2006. *Carex diandra* Schrank (lesser panicked sedge): a technical conservation assessment. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/carexdiandra.pdf>

Flora of North America Editorial Committee, eds. 1993+. Flora of North America North of Mexico. 20+ vols. New York and Oxford.

**Richardson Needlegrass (*Achnatherum richardsonii*)**

G5; CO-S1

**Distribution, abundance, and population trend on the planning unit:**

Richardson's Needlegrass ranges from Alaska and Manitoba south to Oregon and Colorado. There are no records on the Monument. No local trend data are available, and no demographic studies have been done.

**Brief description of natural history and key ecological functions:**

Richardson's Needlegrass is a perennial herb found in montane meadows and forests of aspen or lodgepole pine at elevations from 7,500 to 10,000 feet. Sites are underlain by Quaternary drift. Soils are developed in alluvium and glacial till. Flowering occurs from July through September. Seed is dispersed by animals and wind. There is no information on diversity within the community.

**Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

Richardson's Needlegrass reaches the southeastern edge of its range. There is widely scattered montane meadow and aspen habitat. It may be threatened by conifer encroachment, fire, and livestock grazing.

**Rationale for analyzing this species as fitting SCC definitions:**

Richardson's Needlegrass may be considered for status as a SCC. There are no records on the Monument. Basic components of the species ecology are known. There may be impacts from grazing. No trend or viability information is available. Additional surveys for Richardson's Needlegrass may be appropriate on the Monument prior to determination as a SCC.

**Key literature:**

NatureServe. 2016. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://explorer.natureserve.org>.

Flora of North America Editorial Committee, eds. 1993+. Flora of North America North of Mexico. 20+ vols. New York and Oxford.

**Bill's Neoparrya (*Neoparrya lithophila*)**

G3; CO-S3

**Distribution, abundance, and population trend on the planning unit:**

Bill's Neoparrya is endemic to south-central Colorado. There are no records on the Monument, the nearest being about ten miles to the south. Habitat may be present on Browns Canyon National Monument. No trend data are available, and no demographic studies have been done.

**Brief description of natural history and key ecological functions:**

Bill's Neoparrya is a perennial herb. It flowers from May to early July, and fruits from late June to September. Long distance dispersal event are rare. It is found from the foothills to subalpine in piñon-juniper woodlands on north-facing ledges, cliffs, and canyons associated with volcanic dikes composed of igneous outcrops, gneiss, or sedimentary rock, and in montane meadows and grasslands. Soils are developed in colluvium and residuum. It is found at elevations ranging from 7,000 to 10,500 feet.

**Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

Potential threats to Bill's Neoparrya are unregulated recreation, grazing, road maintenance, invasive species, and development. Populations are small and isolated in piñon-juniper stands on igneous rocks. Habitat may be present on Browns Canyon NM.

**Rationale for analyzing this species as fitting SCC definitions:**

Bill's Neoparrya may be considered for status as a SCC. There are no records on the Monument, but there are records within about ten miles. It is a local endemic species. Its ecology is fairly well understood. It may be impacted by activities associated with unregulated recreation, range management, and noxious weed treatment. No trend information is available. Species specific surveys should be encouraged prior to determination as a SCC.

**Key literature:**

Anderson, D.G. 2004. *Neoparrya lithophila* Mathias (Bill's neoparrya): a technical conservation assessment. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/neoparryalithiphila.pdf>

**Barneby's Feverfew (*Parthenium alpinum* var. *tetraneuris*)**

= *Bolophyta tetraneuris*

G3; CO-S3

**Distribution, abundance, and population trend on the planning unit:**

Barneby's Feverfew is a regional endemic species known from Colorado and New Mexico. There are no records on the Monument, the nearest about five miles away, but habitat may be present. No trend data are available, and no demographic studies have been done.

**Brief description of natural history and key ecological functions:**

Barneby's Feverfew is a perennial herb that occurs in open juniper woodlands on plains bluff tops at elevations from 4,800 to 5,600 feet. Soils are usually derived from gypsum and shale. Flowers appear in April and May. Fruits are present in May and June and are wind dispersed. There is no information on diversity within the community.

**Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

Habitat alteration, unregulated recreation, and mining may be threats to Barneby's Feverfew. There is limited potential piñon-juniper habitat on gypsum and shale within the Monument boundary.

**Rationale for analyzing this species as fitting SCC definitions:**

Barneby's Feverfew may be considered for status as a SCC. It is a regional endemic species. While it is not known to occur within the Monument, some habitat is present, and there are records only a few miles away. Its ecology is fairly well understood. No trend or viability information is available.

**Key literature:**

NatureServe Explorer: An online encyclopedia of life [web application]. 2016. Version 1.6. Arlington, VA, USA: NatureServe. Available: <http://www.natureserve.org/explorer>

Colorado Natural Heritage Program. 1997+. Colorado Rare Plant Guide. [www.cnhp.colostate.edu](http://www.cnhp.colostate.edu). Latest update: June 30, 2014.

Mears, J.A. 1973. Systematics of *Parthenium* section *Bolophytum* (Compositae, Helianthae): a correlation of morphological, biochemical, and habitat data. *Proceedings of the Academy of Natural Sciences of Philadelphia* 125:121-135.

**Colorado Tansy-aster (*Xanthisma coloradoense*)**

= *Machaeranthera coloradoensis*

G3; CO-S3

**Distribution, abundance, and population trend on the planning unit:**

Colorado Tansy-aster is endemic to Wyoming and Colorado. It is known to occur within the Monument boundary. No trend data are available, and no demographic studies have been done.

**Brief description of natural history and key ecological functions:**

Colorado Tansy-aster is a perennial herb that flowers from July to mid-August and fruits during August. Seed is wind dispersed. It inhabits mountain parks, slopes, rocky outcrops, and dry tundra. Soils are generally gravelly, derived from colluvium and residuum. Sites are often limestone, and have little competition from other plants. It may be found at elevations ranging from 7,600 to 13,000 feet from the montane to alpine. There is no information on diversity within the community.

**Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

Habitat of Colorado Tansy-aster can be affected by unregulated recreation, mining, road construction, off-highway vehicle use, and invasive species. It may be tolerant of some disturbance, but may not compete well.

**Rationale for analyzing this species as fitting SCC definitions:**

Colorado Tansy-aster should be considered for status as a SCC. It is a local endemic species known to occur within the Monument boundary. Its ecology is fairly well understood. It may be impacted by activities associated with unregulated recreation, range management, road maintenance, and invasive species. No trend information is available.

**Key literature:**

Beatty, B.L., W.F. Jennings, and R.C. Rawlinson. 2004. *Machaeranthera coloradoensis* (Colorado tansyaster): a technical conservation assessment. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/machaerantheracoloradoensis.pdf>

**Fendler's Townsend-Daisy (*Townsendia fendleri*)**

G2; CO-S2

**Distribution, abundance, and population trend on the planning unit:**

Fendler's Townsend-Daisy is a regional endemic species known from Colorado and New Mexico. It occurs at several locations within Browns Canyon National Monument. No local trend data are available. There have been no demographic studies done for this species.

**Brief description of natural history and key ecological functions:**

Fendler's Townsend-Daisy is a perennial herb that occurs on arid hills and benches in the foothills and montane climate zones from 7,200 to 8,200 feet elevation. These are sparsely vegetated slopes with piñon and juniper, often on gypsum soils. It has also been found on bunchgrass dominated river terraces. Flowering occurs from June through September. Its short stature and short, plumose pappus implies short to moderate distance dispersal via wind. There is no information on diversity within the community.

**Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

Habitat for Fendler's Townsend-Daisy is abundant in the Arkansas River valley. Available habitat is widespread at Browns Canyon National Monument. Threats to this species include improper range management, motorized recreation, and noxious weed invasion and treatment.

**Rationale for analyzing this species as fitting SCC definitions:**

Fendler's Townsend-Daisy should be considered for status as a SCC. It is a regional endemic species known to occur within the Monument boundary. Its ecology is known and populations appear to have good viability, but there is no trend data. There are records on Browns Canyon NM, and impacts of unregulated recreation, range management, and noxious weed treatments may be concerns. Surveys should be conducted to determine the distribution of the plant prior to final determination as a SCC.

**Key literature:**

NatureServe Explorer: An online encyclopedia of life [web application]. 2016. Version 1.6. Arlington, VA, USA: NatureServe. Available: <http://www.natureserve.org/explorer>.

Flora of North America Editorial Committee, eds. 1993+. Flora of North America North of Mexico. 7+ vols. New York and Oxford.

Colorado Natural Heritage Program. 1997+. Colorado Rare Plant Guide.

<http://www.cnhp.colostate.edu/download/projects/rareplants/list.asp?list=master#>

**Strigose Townsend-Daisy (*Townsendia strigosa*)**

G4; CO-S1

**Distribution, abundance, and population trend on the planning unit:**

Strigose Townsend-Daisy ranges from Wyoming south to Arizona and New Mexico. There are no records on the Monument. No trend data are available, and no demographic studies have been done.

**Brief description of natural history and key ecological functions:**

Strigose Townsend-Daisy is an annual or biennial forb found in the plains and foothills in sandy or clay soils on dry sites. It occurs at elevations from 5,000 to 6,700 feet. It flowers during May and June. Seed is spread by the wind. There is no information on diversity within the community.

**Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

There is a limited amount of habitat for Strigose Townsend-Daisy in sand and clay soils. This habitat could be affected by unregulated recreation and livestock grazing.

**Rationale for analyzing this species as fitting SCC definitions:**

Strigose Townsend-Daisy may be considered for status as a SCC. There are no records of Strigose Townsend-Daisy within the Monument boundary, but populations occur nearby. Basic components of the species ecology are known. Its limited potential habitat could be impacted by recreation and grazing activities. No trend or viability information is available. Some survey for this species would be appropriate prior to determination as a SCC.

**Key literature:**

NatureServe. 2016. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://explorer.natureserve.org>.

Flora of North America Editorial Committee, eds. 1993+. Flora of North America North of Mexico. 20+ vols. New York and Oxford.

**Livemore Fiddleleaf (*Nama dichotomum*)**

G4; CO-S1

**Distribution, abundance, and population trend on the planning unit:**

Livemore Fiddleleaf ranges from California and Colorado south to Mexico and Texas. It is known to occur within the Monument boundary. No trend data are available, and no demographic studies have been done.

**Brief description of natural history and key ecological functions:**

Livemore Fiddleleaf is an annual forb found from the plains to montane on sandstone and in sandy soils at 5,300 to 10,000 feet. Habitat is described as piñon-juniper, ponderosa pine, and aspen stands. It has been found in areas underlain by Leadville limestone and Ordovician formations, and granitic rocks of 1,700 M.Y. age group. Soils are developed in residuum. It flowers from June through September. Seed is probably dispersed by animals. There is no information on diversity within the community.

**Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

The Monument is near the northeastern edge of the range of Livemore Fiddleleaf. There is sandy soil habitat for this species on Browns Canyon NM. It may be affected by livestock grazing.

**Rationale for analyzing this species as fitting SCC definitions:**

Livemore Fiddleleaf may be considered for status as a SCC. The area is near the edge of the species range. It is known to occur within the Monument boundary. Basic components of the species ecology are known. It could be affected by livestock grazing. Unregulated recreation could be a concern at Browns Canyon NM. No trend or viability information is available. Species specific surveys should be encouraged prior to determination as a SCC.

**Key literature:**

NatureServe. 2016. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://explorer.natureserve.org>.

**Rocky Mountain Phacelia (*Phacelia denticulata*)**

G3; CO-SU

**Distribution, abundance, and population trend on the planning unit:**

Rocky Mountain Phacelia is a regional endemic species found from Wyoming south to New Mexico. There are no records on the Monument. No trend data are available, and no demographic studies have been done.

**Brief description of natural history and key ecological functions:**

Rocky Mountain Phacelia is an annual herb that occurs in sandy or rocky soils on steep forested slopes. Elevation ranges from 5,500 to 10,000 feet from the foothills to subalpine. Flowers appear in June and July. Fruit may be present into September. It is probably dispersed by wind and animals. There is no information on diversity within the community.

**Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

Unregulated recreation, noxious weeds, and mineral development on steep rocky slopes may threaten Rocky Mountain Phacelia. It is a regional endemic species.

**Rationale for analyzing this species as fitting SCC definitions:**

Rocky Mountain Phacelia may be considered for status as a SCC. There are no records on the Monument. Its ecology is fairly well understood. It may be impacted by activities associated with unregulated recreation, mining, and noxious weed treatment. It is a local endemic. No trend or viability information is available. Surveys for this species are suggested prior to determination as a SCC.

**Key literature:**

NatureServe Explorer: An online encyclopedia of life [web application]. 2016. Version 1.6. Arlington, VA, USA: NatureServe. Available: <http://www.natureserve.org/explorer>

Colorado Natural Heritage Program. 1997+. Colorado Rare Plant Guide. [www.cnhp.colostate.edu](http://www.cnhp.colostate.edu). Latest update: June 30, 2014.

**Crandall's Rockcress (*Boechea crandallii*)**

= *Arabis crandallii*

G2; CO-S2

**Distribution, abundance, and population trend on the planning unit:**

Crandall's Rockcress is a regional endemic, found in southern Wyoming and western Colorado. There are no records on the Monument, although several records are nearby. No trend data are available. There have been no demographic studies done for this species.

**Brief description of natural history and key ecological functions:**

Crandall's rockcress is a perennial herb in the mustard family. It flowers from late May to June, and fruits appear from June through July. There are no obvious dispersal mechanisms. It is found in rocky montane to subalpine areas with sagebrush at elevations from 6,500 to 10,600 feet. It also occurs in aspen stands and coniferous woodlands. The rock may be granitic, limestone, shale, or sandstone. Soils are developed in residuum, colluvium, alluvium, and glacial till. There is no information on diversity within the community. It may be indistinguishable from *B. pallidifolia*. When both species occur in the same location, *B. crandallii* occurs on exposed sites and *B. pallidifolia* is in protected areas.



---

**Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

The habitat of Crandall's Rockcress appears to be relatively common in the vicinity. It is a regional endemic species, but no trend or viability information is available. This is a low density species with a few to numerous individuals scattered in areas of appropriate habitat. It may be under reported. Threats may include development, road construction and maintenance, livestock grazing, and unregulated recreation.

**Rationale for analyzing this species as fitting SCC definitions:**

Crandall's Rockcress may be considered for status as a SCC because of its likely presence in areas with active range allotments. There are no records on the Monument, but it does occur nearby and habitat is present. Range management, road maintenance, and unregulated recreation could impact this species. However, study needs to be done to clarify the limits of this species and *B. pallidifolia*. Surveys should be done to determine the distribution of this species prior to final determination as a SCC.

**Key literature:**

Ladyman, J.A.R. (2005, May 25). *Boechera crandallii* (B.L. Robinson) W.A. Weber (Crandall's rockcress): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/boecheracrandallii.pdf>

Al-Shehbaz, I.A. 2003. Transfer of most North American species of *Arabis* to *Boechera* (Brassicaceae). *Novon* 13(4):381-391.

NatureServe Explorer: An online encyclopedia of life [web application]. 2016. Version 1.6. Arlington, VA, USA: NatureServe. Available: <http://www.natureserve.org/explorer>.

Flora of North America Editorial Committee, eds. 1993+. *Flora of North America North of Mexico*. 7+ vols. New York and Oxford.

Colorado Natural Heritage Program. 1997+. *Colorado Rare Plant Guide*.

<http://www.cnhp.colostate.edu/download/projects/rareplants/list.asp?list=master#>

**Brandege's Buckwheat (*Eriogonum brandegeei*)**

G1G2; CO-S1S2

**Distribution, abundance, and population trend on the planning unit:**

Brandege's Buckwheat is endemic to Chaffee, El Paso, Fremont, and Park counties of Colorado. There are no records on the Monument, but a population occurs less than one mile from the boundary. There has been one demographic study done for this species by Denver Botanic Gardens (2004-2008). It had been petitioned for listing under ESA, but was later withdrawn.

**Brief description of natural history and key ecological functions:**

Brandege's Buckwheat is a mat-forming perennial herb that flowers from June through August. Fruit matures in August and September. With no well-developed mechanisms and specific habitat requirements, seed dispersal is likely to be over only short distances. It grows in the foothills in association with open sagebrush or piñon-juniper stands on unstable white to grayish limestone-shale soils of the Dry Union and Morrison formations at elevations ranging from 5,700 to 8,600 feet. There is no information on diversity or ecological function within the community.

**Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

Brandege's Buckwheat is not expected on the Monument due to the lack of appropriate geologic formations. It is a substrate specialist, but the appropriate geologic formations are not known to occur within the Monument boundary. A small amount of similar appearing habitat is present on the extreme

southwestern corner of the Monument. General threats include unregulated recreation, development, and mining.

**Rationale for analyzing this species as fitting SCC definitions:**

Brandegee's Buckwheat may be considered for status as a SCC because of the proximity of appropriate geologic formations. There are no records on the Monument. It is a local endemic species with a known ecology. There is no trend information. It is not expected on the Monument due to the lack of appropriate geology. A small amount of similar appearing substrate may be present on the extreme southwestern corner of the Monument that could be impacted by unregulated recreational activities. It had been petitioned for listing under ESA. Species specific surveys should be encouraged prior to final determination as a SCC.

**Key literature:**

U.S. Fish and Wildlife Service. 2009. Endangered and threatened wildlife and plants; partial 90-day finding on a petition to list 206 species in the midwest and western United States as threatened or endangered with critical habitat. 74 FR 41649-41662. Department of the Interior, Washington, D.C.

Anderson, D.G. 2006. *Eriogonum brandegeei* Reveal (Brandegee's buckwheat): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/eriogonumbrandegeei.pdf>

Colorado Natural Heritage Program. 1997+. Colorado Rare Plant Guide. <http://www.cnhp.colostate.edu/download/projects/rareplants/list.asp?list=master#>

**Golden Blazingstar (*Mentzelia chrysantha*)**

G2; CO-S2

**Distribution, abundance, and population trend on the planning unit:**

Golden Blazingstar is a local endemic species found in Fremont and Pueblo counties. There are no records on the Monument. No trend data are available, and no demographic studies have been done.

**Brief description of natural history and key ecological functions:**

Golden Blazingstar is a biennial herb found on unstable, barren limestone, shale, and clay slopes in the Smoky Hill member of the Niobrara formation. It is often associated with piñon-juniper woodlands, and occurs in the plains and foothills at elevations between 4,700 and 6,900 feet. It is often found with Round-leaf Four-O'clock. Flowering occurs from July through September. Seed dispersal may be by wind due to the wings on its seeds. It may also be moved by passing animals.

**Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

The greatest threats to Golden Blazingstar are from gravel mining, development, and unregulated recreation. There is limited habitat on the appropriate shale formations with juniper stands. There is no information on diversity within the community.

**Rationale for analyzing this species as fitting SCC definitions:**

Golden Blazingstar should not be considered for status as a SCC. There are no records on the Monument. It is a local endemic species that is known ecologically. There is no trend or viability information available. Species specific surveys may be considered prior to final determination as a SCC.

**Key literature:**

Anderson, D.G. (2006, July 3). *Mentzelia chrysantha* Engelmann ex Brandegee (golden blazing star): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/mentzeliachrysantha.pdf>

NatureServe Explorer: An online encyclopedia of life [web application]. 2016. Version 1.6. Arlington, VA, USA: NatureServe. Available: <http://www.natureserve.org/explorer>.

Colorado Natural Heritage Program. 1997+. Colorado Rare Plant Guide. <http://www.cnhp.colostate.edu/download/projects/rareplants/list.asp?list=master#>

### **Arkansas Canyon Stickleaf (*Mentzelia densa*)**

G2; CO-S2

#### **Distribution, abundance, and population trend on the planning unit:**

Arkansas Canyon Stickleaf is local endemic species known from approximately 16 sites in Chaffee and Fremont counties in the Arkansas River Valley. It has been found on Browns Canyon National Monument. No trend data are available, and no demographic studies have been done.

#### **Brief description of natural history and key ecological functions:**

Arkansas Canyon Stickleaf is a biennial forb that flowers in July through September. Flowers are open from late afternoon until dark. Fruits mature in September. Seed dispersal may be by wind due to the wings on its seeds. It may also be moved by passing animals. It is found in dry, open habitats and on steep, rocky slopes with piñon and juniper where the understory is sparse. Rocks are usually granitic or gneiss. It is found in the plains and foothills at elevations between 5,400 and 7,700 feet. There is no information on diversity or ecological function within the community.

#### **Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

Arkansas Canyon Stickleaf may be threatened by unregulated recreation and development, although it appears to be tolerant of some disturbance. There are rocky slopes with piñon and juniper habitat on Browns Canyon NM.

#### **Rationale for analyzing this species as fitting SCC definitions:**

Arkansas Canyon Stickleaf should be considered for status as a SCC because potential impacts of mining and unregulated recreation. It is known to occur within the Monument boundary. It is a local endemic species that is known ecologically. There is no trend information available. Species specific surveys are recommended prior to final determination as a SCC.

#### **Key literature:**

NatureServe Explorer: An online encyclopedia of life [web application]. 2016. Version 1.6. Arlington, VA, USA: NatureServe. Available: <http://www.natureserve.org/explorer>.

Colorado Natural Heritage Program. 1997+. Colorado Rare Plant Guide. <http://www.cnhp.colostate.edu/download/projects/rareplants/list.asp?list=master#>

### **Hall's Milkweed (*Asclepias hallii*)**

G3; CO-S3

#### **Distribution, abundance, and population trend on the planning unit:**

Hall's Milkweed ranges from Nevada and Colorado south to Arizona and New Mexico. It is known from Browns Canyon National Monument. No trend data are available, and no demographic studies have been done.

#### **Brief description of natural history and key ecological functions:**

Hall's Milkweed is a perennial herb or subshrub found in sandy and gravelly soils, on sloping streambanks, in piñon-juniper stands, among sagebrush, and in cottonwood groves. Elevation ranges

from 7,400 to 10,000 feet from the plains to montane. Flowering occurs from May through August. Seed is wind dispersed. There is no information on diversity within the community.

**Overview of ecological conditions for recovery, conservation, and viability including Threats and Risk Factors:**

There are no described threats to Hall's Milkweed, but livestock grazing and fire could be concerns. Recreation issues are possible at Browns Canyon National Monument. There is limited piñon-juniper and cottonwood habitat on the Monument.

**Rationale for analyzing this species as fitting SCC definitions:**

Hall's Milkweed should be considered for status as a SCC. It is known from Browns Canyon National Monument. Its ecology is fairly well understood. Activities associated with recreation, range management, and fire could impact this species and its habitat. No trend information is available. Species specific surveys are recommended prior to determination as a SCC.

**Key literature:**

NatureServe Explorer: An online encyclopedia of life [web application]. 2016. Version 1.6. Arlington, VA, USA: NatureServe. Available: <http://www.natureserve.org/explorer>

Colorado Natural Heritage Program. 1997+. Colorado Rare Plant Guide. [www.cnhp.colostate.edu](http://www.cnhp.colostate.edu). Latest update: June 30, 2014.

1 **APPENDIX C – USFS FEDERAL REGISTER NOTICE OF**  
2 **INTENT TO START BROWNS CANYON**  
3 **NATIONAL MONUMENT PLAN ASSESSMENT**  
4 **PHASE**

**DEPARTMENT OF AGRICULTURE****Forest Service****Sitka Resource Advisory Committee****AGENCY:** Forest Service, USDA.**ACTION:** Notice of meeting.

**SUMMARY:** The Sitka Resource Advisory Committee (RAC) will meet in Sitka, Alaska. The committee is authorized under the Secure Rural Schools and Community Self-Determination Act (the Act) and operates in compliance with the Federal Advisory Committee Act. The purpose of the committee is to improve collaborative relationships and to provide advice and recommendations to the Forest Service concerning projects and funding consistent with the Act. RAC information can be found at the following Web site: [http://cloudapps-usda.gov/force.com/FSSRS/RAC\\_Page?id=001t0000002JcwXAAS](http://cloudapps-usda.gov/force.com/FSSRS/RAC_Page?id=001t0000002JcwXAAS).

**DATES:** The meeting will be held May 25, 2017, at 5:00 p.m.

All RAC meetings are subject to cancellation. For status of meeting prior to attendance, please contact the person listed under **FOR FURTHER INFORMATION CONTACT**.

**ADDRESSES:** The meeting will be held at Sitka Ranger District, Katlian Room, 2108 Halibut Point Road, Sitka, Alaska. Meeting will also be available by teleconference, to attend via teleconference, please contact the person listed under **FOR FURTHER INFORMATION CONTACT**.

Written comments may be submitted as described under **SUPPLEMENTARY INFORMATION**. All comments, including names and addresses when provided, are placed in the record and are available for public inspection and copying. The public may inspect comments received at the Sitka Ranger District. Please call ahead to facilitate entry into the building.

**FOR FURTHER INFORMATION CONTACT:** Lisa Hirsch, RAC Coordinator, by phone at 907-747-4214 or via email at [lisahirsch@fs.fed.us](mailto:lisahirsch@fs.fed.us).

Individuals who use telecommunication devices for the deaf (TDD) may call the Federal Information Relay Service (FIRS) at 1-800-877-8339 between 8:00 a.m. and 8:00 p.m., Eastern Standard Time, Monday through Friday.

**SUPPLEMENTARY INFORMATION:** The purpose of the meeting is to:

1. Review project proposals, and
2. Make project recommendations for Title II funds.

The meeting is open to the public. The agenda will include time for people

to make oral statements of three minutes or less. Individuals wishing to make an oral statement should request in writing by May 15, 2017, to be scheduled on the agenda. Anyone who would like to bring related matters to the attention of the committee may file written statements with the committee staff before or after the meeting. Written comments and requests for time to make oral comments must be sent to Lisa Hirsch, RAC Coordinator, 2108 Halibut Point Road, Sitka, Alaska 99835; by email to [lisahirsch@fs.fed.us](mailto:lisahirsch@fs.fed.us), or via facsimile to 907-747-4253.

**Meeting Accommodations:** If you are a person requiring reasonable accommodation, please make requests in advance for sign language interpreting, assistive listening devices, or other reasonable accommodation. For access to the facility or proceedings, please contact the person listed in the section titled **FOR FURTHER INFORMATION CONTACT**. All reasonable accommodation requests are managed on a case by case basis.

Dated: March 30, 2017.

**Jeanne M. Higgins,**

*Acting Associate Deputy Chief, National Forest System.*

[FR Doc. 2017-07761 Filed 4-17-17; 8:45 am]

**BILLING CODE 3411-15-P****DEPARTMENT OF AGRICULTURE****Forest Service****Pike/San Isabel National Forests and Cimarron/Comanche National Grasslands; Chaffee County Colorado; Browns Canyon National Monument Plan Assessment****AGENCY:** Forest Service, USDA.**ACTION:** Notice of intent to start Browns Canyon National Monument Plan Assessment Phase.

**SUMMARY:** Notice of intent to start the assessment phase for The Browns Canyon National Monument Management Plan—Pike/San Isabel National Forests and Cimarron/Comanche National Grasslands (PSICC) Plan amendment and Bureau of Land Management (BLM) Eastern Colorado Resource Management Plan update. An assessment report of ecological, social, and economic conditions and trends for Browns Canyon National Monument will be prepared for the Pike and San Isabel National Forests and Cimarron and Comanche National Grasslands (PSICC) Plan Amendment and Bureau of Land Management Resource Management Plan update.

**DATES:** A draft of the assessment report for the Browns Canyon National Monument, Pike/San Isabel National Forests and Cimarron/Comanche National Grasslands and BLM Royal Gorge Field Office is expected to be completed by fall 2017 and will be posted on the Pike and San Isabel National Forests Projects Web site at: <https://www.fs.usda.gov/project/?project=51098> and BLM Browns Canyon National Monument RMP link at: <https://eplanning.blm.gov/epl-frontoffice/eplanning/planAndProjectSite.do?methodName=renderDefaultPlanOrProjectSite&projectId=69924&dctmId=0b0003e880dda953>. From April to June 2017, the public is invited to engage in a collaborative process to identify relevant baseline information and local knowledge to be considered for the assessment and development of the Browns Canyon National Monument management plan. The Forest, in coordination and cooperation with BLM, will then initiate procedures pursuant to the National Environmental Policy Act (NEPA) and prepare a joint monument management plan-Environmental Impact Statement (EIS). The Forest and BLM will again be cooperatively inviting the public to help identify the appropriate plan components that will become the NEPA proposed action and/or alternatives for the land management plan revision. The NEPA procedures result in a record of decision and the plan revision process results in a draft revised plan. The **Federal Register** availability announcement for these documents starts the pre-decisional administrative review process (36 CFR 219 Subpart B). The administrative review process provides an individual or entity an opportunity for an independent Forest Service review and resolution of issues before the final approval of a plan, plan amendment or plan revision.

**ADDRESSES:** Written comments or questions concerning this notice should be addressed to U.S. Forest Service—Salida Ranger District Attn.: Browns Canyon National Monument—Planning Assessment, 5575 Cleora Road, Salida, CO 81201, or by email to: [blm\\_cobrowncanyon@blm.gov](mailto:blm_cobrowncanyon@blm.gov) (subject heading Browns Canyon National Monument—Planning Assessment).

**FOR FURTHER INFORMATION CONTACT:** John Dow, Forest Planner at 719-553-1476 or Joseph Vieira, BLM Planner-Project Manager at (719) 246-9966. Individuals who use telecommunication devices for the deaf (TDD) may call the Federal Information Relay Service (FIRS) at 1-800-877-8339 between 5 a.m. and 5 p.m., Pacific Time, Monday through

Friday. More information on the planning process can also be found on the Pike and San Isabel National Forests Web site at <https://www.fs.usda.gov/project/?project=51098>.

**SUPPLEMENTARY INFORMATION:** The National Forest Management Act (NFMA) of 1976 requires that every National Forest System (NFS) unit develop a land management plan. On April 9, 2012, the Forest Service finalized its land management planning rule (2012 Planning Rule), which provides broad programmatic direction to National Forests and National Grasslands for developing and implementing their land management plans.

Forest plans describe the strategic direction for management of forest resources for fifteen to twenty years, and are adaptive and amendable as conditions change over time. Under the 2012 Planning Rule, the assessment of ecological, social, and economic trends and conditions is the first stage of the planning process. The second stage is a development and decision process guided, in part, by the NEPA and includes the preparation of a draft environmental impact statement and revised Forest Plan for public review and comment, and the preparation of the final environmental impact statement and revised Forest Plan. The third stage of the process is monitoring and feedback, which is ongoing over the life of the revised forest plans. With this notice, the agency invites other governments, non-governmental parties, and the public to contribute to the development of the assessment report.

The assessment will rapidly evaluate the sustainability of existing ecological, economic, and social conditions and trends within the context of the broader landscape. It will help inform the planning process through the use of Best Available Scientific Information, while also taking into account other forms of knowledge, such as local information, national perspectives, and native knowledge. Lastly, the assessment will help identify the need to change the existing 1984 plan.

The Pike/San Isabel National Forests and Cimarron/Comanche National Grasslands and Bureau of Land Management Royal Gorge Field Office, with lands administered in Chaffee County, Colorado are initiating the Browns Canyon National Monument (NM) planning assessment and management plan process pursuant to Proclamation 9232, establishing the monument specifically states: *In the development and implementation of the management plan, the Secretaries*

*(USDA and Department of Interior) shall maximize opportunities, pursuant to applicable legal authorities, for shared resources, operational efficiency, and cooperation.* A joint agency assessment process will be performed in cooperation with the BLM and National Conservation Lands. The assessment process and results are to be used to inform a Browns Canyon NM Management Plan describing the strategic direction for management of monument resources, objects, and values for the next 15 to 20 years on the Pike/San Isabel National Forests and Cimarron/Comanche National Grasslands and BLM Royal Gorge Field Office.

The Browns Canyon NM Management Plan will amend the PSICC's Land and Resource Management Plan and be incorporated into the BLM's Royal Gorge Field Office Eastern Colorado Resource Management Plan during revision. The first phase of the process, the assessment phase, has begun and interested parties are invited to contribute to the development of the assessment (36 CFR 219.12–17).

Additional information on public participation opportunities will be available on the project Web site: <https://www.fs.usda.gov/project/?project=51098> and BLM Browns Canyon National Monument RMP link at <https://eplanning.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=renderDefaultPlanOrProjectSite&projectId=69924&dctmId=0b0003e880dda953>. The trends and conditions identified in the assessment will help in identifying the need for change, in the development of plan components.

Collaboration as part of the assessment phase supports the development of relationships of key stakeholders throughout the plan revision process, and is an essential step to understanding current conditions, available data, and feedback needed to support a strategic, efficient planning process. As public meetings, other opportunities for public engagement, and public review and comment opportunities are identified to assist with the development of the forest plan revision, public announcements will be made, and notifications will be posted on the Browns Canyon National Monument Project Web page at <https://www.fs.usda.gov/project/?project=51098> and information will be sent out to the Forest's mailing list. If anyone is interested in being on the Forest's mailing list to receive these notifications, please contact John Dow, Forest Planner at 719–553–1476 or Joseph Vieira, BLM Planner-Project

Manager at (719) 246–9966 at the mailing address identified above, or by sending an email to: [blm\\_co\\_browncanyon@blm.gov](mailto:blm_co_browncanyon@blm.gov) (subject heading titled Browns Canyon National Monument—Planning Assessment).

**Responsible Official:** The responsible official for the Browns Canyon National Monument management plan for the Pike/San Isabel National Forests and Cimarron/Comanche National Grasslands is Erin Connelly, Forest Supervisor, Pike/San Isabel National Forests and Cimarron/Comanche National Grasslands, 2840 Kachina Drive, Pueblo, CO 81008.

Dated: April 7, 2017.

**Glenn Casamassa,**

*Associate Deputy Chief, National Forest System.*

[FR Doc. 2017–07797 Filed 4–17–17; 8:45 am]

**BILLING CODE 3411–15–P**

## DEPARTMENT OF AGRICULTURE

### Forest Service

#### Lake Tahoe Basin Federal Advisory Committee

**AGENCY:** Forest Service, USDA.

**ACTION:** Notice of meeting.

**SUMMARY:** The Lake Tahoe Basin Federal Advisory Committee (LTBFAC) will meet in South Lake Tahoe, California. The Committee is established pursuant to Executive Order 13057, and the Federal Advisory Committee Act of 1972. Additional information concerning the Committee can be found by visiting the Committee's Web site at: <http://www.fs.usda.gov/goto/ltbmu/LTFAC>.

**DATES:** The meeting will be held on Friday, May 1, 2017, from 1:00 p.m. to 3:00 p.m.

All LTBFAC meetings are subject to cancellation. For updated status of the meeting prior to attendance, please contact the person listed under **FOR FURTHER INFORMATION CONTACT**.

**ADDRESSES:** The meeting will be held at the Lake Tahoe Basin Management Unit, 35 College Drive, South Lake Tahoe, California.

Written comments may be submitted as described under **SUPPLEMENTARY INFORMATION**. All comments, including names and addresses, when provided, are placed in the record and are available for public inspection and copying. The public may inspect comments received at the USDA Forest Service, 35 College Drive, South Lake Tahoe, California.

**FOR FURTHER INFORMATION CONTACT:** Heather Noel, Lake Tahoe Basin



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 8**

1595 Wynkoop Street  
Denver, CO 80202-1129  
Phone 800-227-8917  
[www.epa.gov/region08](http://www.epa.gov/region08)

**JUN 27 2017**

8EPR-N

Erin Connelly, Forest Supervisor  
Pike/San Isabel National Forests and  
Cimarron/Comanche National Grasslands  
Attn: Browns Canyon National Monument Planning Assessment  
Salida Ranger District  
5575 Cleora Road  
Salida, Colorado 81201

RE: Browns Canyon National Monument Planning Assessment

Dear Supervisor Connelly:

The U.S. Environmental Protection Agency Region 8 is aware that the U.S. Department of Agriculture Forest Service is in the process of developing a Draft Assessment Report of current conditions in the Browns Canyon National Monument (BCNM). This document will provide available information regarding the baseline conditions of the BCNM and is the first step in the BCNM Management Plan and Forest Plan amendment process. Through this process, the Assessment Report will inform the Affected Environment section of the associated Environmental Impact Statement (EIS) that the USFS will prepare under the National Environmental Policy Act (NEPA). For this reason, we appreciate the opportunity to provide early recommendations related to the discussion of baseline conditions in the BCNM. Please note that we would likely provide scoping recommendations, in accordance with our responsibilities under Section 102(2)(C) of the NEPA, should the USFS issue a Notice of Intent to prepare an EIS for the BCNM Management Plan and Forest Plan amendment at a later date in this process.

The Draft Assessment Report will cover a broad spectrum of existing resource conditions in the BCNM. Based on the available information, we have focused our initial recommendations for characterization of baseline conditions on the following: (1) water resources including wetlands and (2) air quality.

**(1) Water Resources, Including Wetlands**

*Existing Conditions*

Existing resource conditions will provide the basis for an effective future analysis of potential impacts. Therefore, we recommend the Draft Assessment Report include the following baseline water resource information (see additional detail in sections below):



- A map and summary of planning area waters, including rivers, streams, tributaries, lakes, springs and wetlands. It would be helpful if the summary identified high resource value water bodies and their designated beneficial uses (e.g., agriculture, fisheries, drinking water, recreation);
- Watershed conditions, including vegetation cover and composition, soil conditions, and areas not meeting desired future conditions;
- Surface water information, including available water quality data in relation to current standards, stream functional assessments, stream channel/stream bank stability conditions, sediment loads and aquatic life;
- Types, functions and acreage of wetlands, riparian areas, and springs;
- Available groundwater information, including quality and location of aquifers; and
- Using the most recent EPA-approved list, a map of water body segments classified by the Colorado Department of Public Health and Environment (CDPHE) as water quality impaired or threatened under the Clean Water Act (CWA) Section 303(d); water bodies considered not impaired by the state; and water bodies that have not yet been assessed by the state for impairment status. We also recommend that a table be provided to identify the designated uses of water bodies and the specific pollutants of concern, where applicable. The CDPHE can identify/validate any CWA Section 303(d) listed waterbodies in the planning area. The most recent EPA-approved 303(d) list for Colorado is dated 2016.

Water Quality Data: Water quality data for the streams and lakes of the analysis area provide important information to guide management for the BCNM, as well as a baseline for future monitoring and evaluation of potential influence on downstream water quality. We recommend the Draft Assessment Report provide a summary of available information and monitoring data on water quality for the planning area, including parameters such as total nitrogen, total phosphorus, total suspended solids, temperature and those of interest for impaired waterbodies within and downstream of the planning area. Identification of any significant gaps in data may be helpful in developing monitoring plans.

Erosion and Sediment Load Analysis: Erodible soils may represent a source of pollutants in the planning area. Increased sediment from surface disturbance may degrade water quality in receiving streams and may represent a significant source of pollutants when mobilized by natural and human-caused soil disturbances. Depending on a host of variables including soil characteristics, industrial operations, condition of roads/trails, and topography, associated runoff from future USFS-authorized activities could introduce sediments as well as salts, selenium, heavy metals, nutrients and other pollutants into surface waters.

We recommend providing a map of fragile soils, such as those with elevated levels of salinity or selenium and/or those prone to erosion, in the planning area. Because sediment loading may already be a concern and future USFS-authorized activities could result in new surface disturbance that may enable erosion, it is important to provide baseline information about this issue. Therefore, we recommend including a qualitative assessment of erosion rates in the planning area. If this qualitative assessment indicates the potential for significant impacts to water quality, then we recommend the Draft Assessment Report provide a quantitative estimate of erosion rates. For example, erosion rates can be calculated using the Water Erosion Prediction Project model (WEPP), a web-based interface developed by the

U.S. Department of Agriculture, Agricultural Research Service, which can be accessed at: <http://www.ars.usda.gov/Research/docs.htm?docid=18084&pf=1>. We recommend that the USFS consider using this model or another appropriate model that would be applicable to this planning area.

Groundwater: Groundwater may be an important resource to analyze if it provides domestic and/or public water supply in the analysis area. Groundwater quality is also important because groundwater may discharge to lakes and streams or be recharged by these water bodies. Shallow aquifers are more susceptible to contamination because a contaminant introduced at the surface may more rapidly enter the system, and there is less intervening soil to adsorb the contaminants before they reach the groundwater. We recommend the Draft Assessment Report include a map of all groundwater resources of the BCNM and a discussion to include the following information, if available:

- Identification of major aquifers;
- Location and extent of groundwater recharge areas;
- Location of shallow and sensitive aquifers that are susceptible to contamination from surface activities, including alluvial aquifers along streams and rivers; and
- Location of existing and potential (i.e., those that can reasonably be used in the future) underground sources of drinking water (USDW).<sup>1</sup>

Please include available groundwater quality information, and identify which shallow aquifers are sources for public water systems, domestic wells or stock wells. We also recommend identifying any public water systems in the planning area with water quality violations or with requirements for increased frequency of monitoring for contaminants. The CDPHE is a good source of information concerning aquifers.

Public Drinking Water Supply Source Characterization: In order to ensure that public drinking water supply sources (e.g., surface water sources, including groundwater under the direct influence of surface water sources, and groundwater sources) are protected from potential impacts associated with future USFS-authorized activities in the planning area, it is important to identify where these sources are located. Therefore, the EPA recommends that the Draft Assessment Report include a map depicting municipal supply watersheds<sup>2</sup> and source water protection areas for public water supply wells and surface water intakes (streams, rivers and reservoirs) in accordance with State data security requirements. Please note that more specific maps, available from the CDPHE, should be utilized by the USFS when locating future project activities. Please contact CDPHE Source Water Protection Program Coordinator, John Duggan, at (303) 692-3534 or [john.duggan@state.co.us](mailto:john.duggan@state.co.us) for more information and these Geographic Information System (GIS) layers.

Roads/Trails: We recommend that the Draft Assessment Report include a map identifying the existing

---

<sup>1</sup> In general, this includes aquifers with a concentration of total dissolved solids (TDS) less than 10,000 mg/L and with a quantity of water sufficient to supply a public water system. Aquifers are presumed to be USDWs unless they have been specifically exempted or if they have been shown to fall outside the definition of USDW (e.g.,  $\geq 10,000$  mg/L TDS).

<sup>2</sup> Forest Service Manual (FSM2542) defines Municipal Supply Watersheds to include: "surface supply watersheds, sole source aquifers, and the protection zones around wells and springs."

forest road/trail network juxtaposed with planning area waters. It would be helpful to note current and foreseeable road/trail activities such as construction, reconstruction, maintenance, storage, decommissioning, and watershed improvements, where such activities are positively or negatively affecting known road/trail impacts to water resources.

## **(2) Air Quality**

Air quality information will be an important component of this Draft Assessment Report given that the BCNM is near towns, Clean Air Act (CAA) Class I Areas (e.g., Maroon Bells-Snowmass Wilderness Area and Great Sand Dunes National Park) and Sensitive Class II Areas. In addition to the health-based National Ambient Air Quality Standards (NAAQS) that protect ambient air quality, the CAA provides Class I Areas with special protection for air quality and air quality related values (AQRVs), including visibility. Sensitive Class II Areas are areas for which Federal Land Managers have identified air quality and/or AQRVs as valued resources. The EPA recommends that the Draft Assessment Report disclose the current air quality conditions in and near the planning area.

### *Existing Conditions*

We recommend that the USFS characterize existing air quality conditions to set the context for evaluating future USFS-authorized activities. To that end, we recommend the Draft Assessment Report include the following:

- Identification of sensitive receptors in the vicinity (such as population centers, Class I Areas and Sensitive Class II Areas);
- Airshed classifications and baseline conditions at nearby population centers;
- Available emissions inventory data for the planning area and disclosure of any regional concerns in the area (e.g., particulate and/or ozone issues); and
- Trends in air quality at nearby Class I Areas over the past several years.

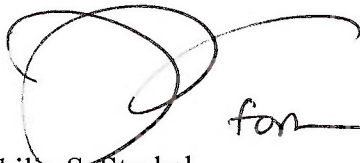
Such data are available from CDPHE and/or the VIEWS site for air quality related values (AQRVs) (<http://views.cira.colostate.edu/web/>). The most current National Emission Inventory data is available at <http://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data>. Decision-makers will need to understand baseline conditions in an effort to ensure that future USFS-authorized forest management activities, when combined with air quality impacts from other sources, do not adversely impact the NAAQS or AQRVs such as visibility.

### **Closing**

We appreciate your consideration of our comments at this early stage of the BCNM Management Plan and Forest Plan amendment process. Our comments are intended to help ensure a thorough assessment of the BCNM's existing conditions with the understanding that this assessment will inform the

Affected Environment chapter of the USFS's related EIS. If further explanation of our comments is desired, please contact me at (303) 312-6704, or your staff may contact Amy Platt at (303) 312-6449 or [platt.amy@epa.gov](mailto:platt.amy@epa.gov).

Sincerely,

A handwritten signature in black ink, consisting of a large, stylized loop followed by the letters 'for' in a cursive script.

Philip S. Strobel  
Director, NEPA Compliance and Review Program  
Office of Ecosystems Protection and Remediation

**Conservation Colorado \* Conservation Lands Foundation \* Friends of Browns Canyon  
Sierra Club \* The Wilderness Society**

June 30, 2017

U.S. Forest Service – Salida Ranger District  
Attn: Browns Canyon National Monument Planning Assessment  
5575 Cleora Rd.  
Salida, CO 81201

*Letter submitted via email to [blm\\_co\\_browncanyon@blm.gov](mailto:blm_co_browncanyon@blm.gov). Literature cited and attachments provided via ground mail.*

Re: Notice of intent to start Browns Canyon National Monument Plan Assessment Phase

Dear Monument Planning Team:

The Wilderness Society, Friends of Browns Canyon, Conservation Colorado, Conservation Lands Foundation, and Sierra Club are pleased to present the following comments for consideration and incorporation in the assessment phase of the Browns Canyon National Monument management plan.

The Wilderness Society's (TWS) mission is to protect wilderness and inspire Americans to care for our wild places. The lands that comprise Browns Canyon National Monument have long been a priority for TWS. Since its founding in 1935, TWS has worked closely with diverse interests who care about the future of our national forests. We provide scientific, legal, and policy guidance to land managers, communities, local conservation groups, and state and federal decision-makers aimed at ensuring the best management of our public lands. Our 700,000 members and supporters nationwide and, in particular, our more than 19,220 members and supporters in Colorado are deeply interested in this Monument planning process as it pertains to the conservation, restoration, and protection of wildlands, wildlife, water, recreation, and the ability to enjoy public lands for inspiration and spiritual renewal.

Conservation Colorado's mission is to educate and mobilize people to protect Colorado's environment and quality of life. Conservation Colorado is a grassroots, statewide organization working to protect Colorado's air, land, water, and people, and we have an extensive history in Colorado of collaborating on the key environmental issues of the day, including 50 years of advocacy for wilderness and public lands conservation.

Friends of Browns Canyon's (FOBC) mission is to protect, conserve, and enhance the ecological and aquatic resources of the wildlands within Browns Canyon. Formed in 2003, FOBC is an all-volunteer organization that works on conservation, education, and stewardship projects in the Browns Canyon National Monument.

The Conservation Lands Foundation (CLF) is a non-profit organization that promotes environmental conservancy through support of the National Landscape Conservation System (National Conservation

Lands) and preservation of the outstanding historic, cultural, and natural resources of those public lands. CLF mission is to protect, restore, and expand the National Conservation Lands through education, advocacy, and partnership. CLF has developed a Friends Grassroots Network that consists of over 60 non-profit organizations located in twelve states to promote the protection of the National Conservation Lands.

The Sierra Club's members and supporters are more than 2.4 million across the country with more than 55,000 here in Colorado. Inspired by nature, we work together to protect our communities and the planet. We're involved in everything from hiking to environmental education and conservation. We are here to repair the follies of our past, protect the current national treasures Colorado holds in nature from damage or destruction, and plan for a future that is better than our present.

The 2012 National Forest System Land Management Planning Rule requires the Forest Service to provide opportunities for public participation in the development of the assessment, including the submission of existing information by the public.<sup>1</sup> This submission specifically addresses several of the topics the Monument Planning Team is required to evaluate in a plan assessment:

- (1) Monument objects identified in the Browns Canyon National Monument Proclamation
- (2) Potential need and opportunity for additional designated areas;
- (3) Recreation; and
- (4) Ecological integrity and wildlife.<sup>2</sup>

While certainly not exhaustive, we believe the information contained in this letter and its appendices represents the best available scientific information, which the Forest Service's 2012 planning rule requires the agency to utilize.<sup>3</sup> We anticipate that the Monument Planning Team will have significant additional forest-specific information available and will also incorporate that information into the assessment.

We look forward to further discussing the information in this letter and working with you throughout the assessment and plan revision process. Please contact Josh Hicks, Forest Planning and Policy Assistant Director for TWS with any questions about this letter.

Regards,

---

<sup>1</sup> 36 C.F.R. § 219.4(a) (generally requiring "opportunities to the public for participating in the assessment process"); *id.* § 219.6(a)(2) (agency must "[c]oordinate with or provide opportunities for . . . non-governmental parties[] and the public to provide existing information for the assessment").

<sup>2</sup> 36 C.F.R. § 219.6(b) enumerates fifteen categories for which "the responsible official shall identify and evaluate existing information relevant to the plan area." The categories most relevant to this submission include: "potential need and opportunity for additional designated areas," *id.* § 219.6(b)(15); "[r]ecreation settings, opportunities and access, and scenic character," *id.* § 219.6(b)(9); and [t]errestrial ecosystems, aquatic ecosystems, and watersheds; *id.* §§ 219.6(b)(1); [s]ystem drivers, including dominant ecological processes, disturbance regimes, and stressors, such as natural succession, wildland fire, invasive species, and climate change; and the ability of terrestrial and aquatic ecosystems on the plan area to adapt to change; *id.* §§ 219.6(b)(3) [t]hreatened, endangered, proposed and candidate species, and potential species of conservation concern present in the plan area; *id.* §§ 219.6(b)(5).

<sup>3</sup> 36 C.F.R. § 219.3 (agency "shall use the best available scientific information to inform the planning process" and "shall document how [that] information was used to inform the assessment").

Joshua Hicks  
Assistant Director, National Forest Action Center  
The Wilderness Society  
303-650-1148  
[josh\\_hicks@tw.s.org](mailto:josh_hicks@tw.s.org)

Phil Hanceford  
Conservation Director, BLM Action Center  
The Wilderness Society  
303-225-4636  
[phil\\_hanceford.tw.s.org](mailto:phil_hanceford.tw.s.org)

Michael Kunkel  
Co-Founder  
Friends of Browns Canyon  
719-530-0522 x101  
[kunk.lws@gmail.com](mailto:kunk.lws@gmail.com)

Scott Braden  
Public Lands & Wilderness Advocate  
Conservation Colorado  
720-530-7473  
[scott@conservationco.org](mailto:scott@conservationco.org)

Brian Sybert  
Executive Director  
Conservation Lands Foundation  
970-247-0807  
[brian@conservationlands.org](mailto:brian@conservationlands.org)

Kimberley Pope  
Organizing Representative, Our Wild America  
Sierra Club  
303-454-3374  
[kim.pope@sierraclub.org](mailto:kim.pope@sierraclub.org)

## Table of Contents

I.	General Pre-Scoping Issues .....	5
A.	Management Considerations.....	5
B.	Development of a New Plan .....	6
II.	Information for the Development of the Assessment .....	7
A.	Optimizing the Assessment.....	7
B.	Monument Objects .....	7
C.	Potential Need and Opportunity for Additional Designated Areas .....	8
D.	Recreation.....	25
E.	Ecological Integrity and Wildlife .....	28
F.	Climate Change .....	36
G.	Areas of Tribal Importance & Cultural and Historic Resources and Use .....	38
III.	Conclusion .....	39
	List of Appendices.....	41
	Literature Cited .....	40



## I. General Pre-Scoping Issues

### A. Management Considerations

#### 1. Protection of the Monument Objects Must Be the Primary Priority

Pursuant to the legal authority granted by Congress in the Antiquities Act of 1906,<sup>4</sup> the President designated the Browns Canyon National Monument (the Monument) for the explicit purpose of protecting and preserving its identified monument objects, which includes the area's prehistoric and historic legacy, diverse array of scientific resources, ecological resources including fish and wildlife, and recreation opportunities. Accordingly, the management priority, therefore, must be the protection and preservation of its natural, cultural, historic and scientific values, and only allow uses other than those needed for protection of monument objects when those uses do not conflict with the directives of the Proclamation.

This is a different approach than utilized in the development of the 1984 Pike-San Isabel National Forest (PSINF) Land and Resource Management Plan (LRMP) and the 1996 Royal Gorge Field Office (RGFO) Resource Management Plan (RMP) which, within a framework of existing environmental law and regulation, applied a multiple use management approach without necessarily trying to ensure full protection to what are now Monument objects.

The Need to Change Analysis provided to the public must reflect the change in management direction imposed by the Proclamation. Although current authorities may exist that affect the management of monument objects, these authorities may not have been designed to protect those objects at the level envisioned in or demanded by the monument proclamation, and hence the Forest Service and BLM cannot as a general matter rely on the existing regulatory framework to ensure protection.<sup>5</sup> This shift in management priority is recognized by other National Monuments<sup>6</sup> as well as in case law.<sup>7</sup>

---

<sup>4</sup> 16 U.S.C. §§ 431-433.

<sup>5</sup> For example, the National Historic Preservation Act (cited in the Need to Change Analysis on page 6 as an existing authority adequate to protect historic monument objects) enables the removal of a cultural artifact so long as documentation and other requirements are met.

<sup>6</sup> For example, the Grand Staircase-Escalante National Monument Management Plan mimics and paraphrases much of the proclamation language. For example, the plan recognizes that, "[t]he Proclamation, which is the principal direction for management of the Monument, clearly dictates that the BLM manage the Monument for 'the purpose of protecting the objects identified.' All other considerations are secondary to that edict." Grand Staircase-Escalante National Monument Management Plan, BLM, at 3. With this, BLM is acknowledging that the primary purpose of the monument, to protect the objects and values, will take precedence over all other multiple uses not identified in the proclamation. The Grand Staircase-Escalante National Monument plan goes on to discuss the primary purpose of the monument as described in the Proclamation, and how "the remote and undeveloped character of the Monument is responsible for the existence and quality of most of the scientific and historic resources described in the Presidential Proclamation." *Id.* at 5. In addition, the plan states the uniqueness that the monument represents among other public lands managed by the BLM is attributable to its remoteness and opportunities for science and education and noting that it has a more specific purpose than other BLM lands. *Id.* at 4-5. Thus, BLM is embracing the distinctness of the monument and its charge to protect these values above all others.

<sup>7</sup> See *Nat'l Trust for Historic Preservation v. Suazo*, No. CV-13-01973-PHX-DGC, 2015 U.S. Dist. LEXIS 39380, at \*17-24 (D. Ariz. Mar. 27, 2015) (overturning portion of plan for Sonoran Desert National Monument that permitted recreational target shooting in violation of the Proclamation's direction to provide "paramount" protection to monument objects). Also see: *Mont. Wilderness Ass'n v. Connell*, 725 F.3d 988, 1011 (9th Cir. Mont. 2013) ("In a challenge to Upper Missouri River Breaks National

The most important aspect of this plan amendment is ensuring that the objects that the Monument was designated to protect are conserved, protected and restored over the life of the plan. While discretionary uses may be allowed to continue if compatible with that charge, the Forest Service and BLM must modify or prohibit such uses if they are in conflict with the values that the areas were designated to protect.

2. The proposed forest plan amendment must satisfy the substantive and procedural requirements of the Forest Service's 2012 planning rule

The proposed amendment to the 1984 PSINF LRMP is subject to the 2012 planning rule provisions at 36 C.F.R. part 219, and not the provisions of the 1982 planning rule under which the existing forest plan was developed.<sup>8</sup> Thus, the Forest Service must ensure that the amendment satisfies the substantive requirements of the 2012 planning rule. Those requirements include providing for ecological sustainability by "maintain[ing] or restor[ing]": (a) "the ecological integrity of terrestrial and aquatic ecosystems and watersheds," including "structure, function, composition, and connectivity;" (b) air and water quality, soils and soil productivity, and water resources; and (c) "the ecological integrity of riparian areas," including their "structure, function, composition, and connectivity."<sup>9</sup> Plans also must provide for: (a) "the diversity of plant and animal communities;" (b) "the persistence of native species;" and (c) "the diversity of ecosystems and habitat types."<sup>10</sup> Also, plans must account for "[s]ustainable recreation; including recreation settings, opportunities, and access; and scenic character"<sup>11</sup> as well as stressors including climate change, and the ability of ecosystems to adapt to change.<sup>12</sup> The decision document for the plan amendment "must include . . . [a]n explanation of how the plan components meet [those] substantive requirements."<sup>13</sup> In satisfying these substantive requirements, the agency must "use the best available scientific information to inform the planning process."<sup>14</sup>

## **B. Development of a New Plan**

We urge the Forest Service and BLM to develop a new plan pursuant to 36 C.F.R. § 219.5(a)(2)(i) as opposed to an amendment to the existing land management plans. Given that the Monument is a nationally recognized stand-alone unit with specific management direction prescribed in the Proclamation and includes both national forest and BLM lands, it only makes sense to develop a new plan rather than amend the existing land management plans.

In terms of the national forest portion of the Monument, it is much cleaner to develop the monument plan under the Forest Service's 2012 planning regulation rather than try to stitch 2012 rule amendments

---

Monument management plan, the court stated that "The national monument designation changed the status quo for the Upper Missouri River Breaks area, elevating protection of the "biological, geological, and historical objects of interest."

<sup>8</sup> 36 C.F.R. § 219.17(b)(2) (following a 3-year transition period that expired May 9, 2015, "all plan amendments must be initiated, completed and approved under the requirements of this part").

<sup>9</sup> 36 C.F.R. § 219.8(a).

<sup>10</sup> 36 C.F.R. § 219.9.

<sup>11</sup> 36 C.F.R. § 219.8(b)(2).

<sup>12</sup> 36 C.F.R. § 219.8(a)(1)(iv).

<sup>13</sup> 36 C.F.R. § 219.14(a)(2).

<sup>14</sup> 36 C.F.R. § 219.3.

to a 1982 rule plan – an effort that will lead to confusion and potential disagreements over guiding direction. Moreover, utilizing an amendment for the monument management plan will lead to complications in the future when the PSINF revises its LRMP. Such a revision would remove the underlying foundation of the Monument plan amendment, triggering a simultaneous revision of the younger Monument plan.

## **II. Information for the Development of the Assessment**

### **A. Optimizing the Assessment**

As a preliminary matter, we have over-arching suggestions for optimizing the assessment to ensure it complies with the letter and intent of the Forest Service’s 2012 planning rule and provides the information necessary for a successful plan revision. The assessment is designed to “rapidly evaluate existing information about relevant ecological, economic, and social conditions, trends, and sustainability and their relationship to the land management plan” and to provide the basis for the identification of the need to change existing plan direction.<sup>15</sup> To that end, the Forest Service’s 2012 rule enumerates fifteen topics that the assessment must address.<sup>16</sup> For each of those topics, we suggest that the Forest Service and BLM develop a series of questions that the assessment will strive to answer.<sup>17</sup> We believe that question-and-answer approach will best assist the agencies in evaluating the extent to which current plan direction satisfies the substantive requirements of the Forest Service’s 2012 rule, Federal Land Management Policy Act (FLPMA) and other relevant law and policy. The following sections of this letter propose relevant questions for each of the topics addressed in detail.

After developing the questions, the Monument Planning Team should identify existing studies, reports, proposals, and other information that may be relevant, determine which sources of information constitute the best available scientific information, and utilize that information to answer the questions. In doing so, the agencies must “[d]ocument . . . how the best available scientific information was used to inform the assessment,” including “[i]dentify[ing] what information was determined to be the best available scientific information, explain[ing] the basis for that determination, and explain[ing] how the information was applied to the issues considered.”<sup>18</sup> In addition to recommending questions, this letter also strives to identify best available scientific information and apply it to answer the relevant questions.

### **B. Monument Objects**

#### **1. Identification and Evaluation of Monument Objects**

The Monument Planning Team must clarify how it is interpreting the President’s Proclamation regarding which named entities it believes qualify as the monument objects warranting protection. The

---

<sup>15</sup> 36 C.F.R. § 219.5(a)(1) & (2)(i).

<sup>16</sup> 36 C.F.R. § 219.6(b).

<sup>17</sup> See, e.g., Nantahala and Pisgah National Forests Assessment (Mar. 2014), available at [http://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprd3793034.pdf](http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprd3793034.pdf) (generally utilizing question and answer approach).

<sup>18</sup> 36 C.F.R. §§ 219.3, 219.6(a)(3).

assessment should include this list of Monument objects. We expect this list to include geological features, cultural resources, recreation, specific species, their habitats and other notable plant communities as listed in the Proclamation. The list of monument objects should not be narrowly interpreted and limited to those specific resources explicitly listed in the Proclamation.

The assessment also needs to provide an inventory and assessment of the Monument objects and their condition. This up-to-date information in an easy-to-access format will ensure that the Forest Service, BLM and the public are properly considering these objects from the outset of the planning process.

Although the Forest Service does not have on-point policy direction related to treating monument objects in management plans, the BLM does. The BLM policy directs managers upon the creation of a newly established monument to “Initiate inventories of the objects and values for which the Monument....was designated”<sup>19</sup> and, in developing a monument plan, “[c]learly identify Monument....objects and values as described in the designating proclamation....; where objects and values are described in the designating....proclamation only in broad categories (e.g. scenic, ecological, etc.), identify the specific resources....that fall into those categories....”<sup>20</sup> The BLM policy direction must be applied to this Monument planning process.

The failure to inventory the condition, location, threats, and trends related to Monument objects can result in harm. Given the high level of recreation in the planning area, for example, is recreation a threat to certain species or cultural resources on the Monument? Along this same vein, the existing land management plans may not address certain species that are called out as Monument objects of interest in the Monument Proclamation. Without an inventory and evaluation of the condition of Monument objects, the public and agencies will not be able to easily tell if existing plan direction is adequate or if the management direction needs to change to protect these objects.

### C. Potential Need and Opportunity for Additional Designated Areas

The Forest Service’s 2012 planning rule requires that an assessment evaluate “[e]xisting designated areas located in the plan area including wilderness and wild and scenic rivers **and potential need and opportunity for additional designated areas.**”<sup>21</sup> This evaluation is intended to inform the plan revision process, which in turn requires the Forest Service to determine whether to designate or recommend for designation any additional areas:

The responsible official shall: . . . (v) Identify and evaluate lands that may be suitable for inclusion in the National Wilderness Preservation System and determine whether to recommend any such lands for wilderness designation. (vi) Identify the eligibility of rivers for inclusion in the National Wild and Scenic Rivers System . . . . (vii) Identify existing designated areas other than [Wilderness and Wild and Scenic Rivers] and determine whether to recommend any additional areas for designation. If the responsible official

---

<sup>19</sup> BLM Manual 6220. Section 1.6 D.

<sup>20</sup> BLM Manual 6220. Section 1.6 G(4).

<sup>21</sup> 36 C.F.R. § 219.6(b)(15) (emphasis added).

has the delegated authority to designate a new area or modify an existing area, then the responsible official may designate such area when approving the . . . plan revision.<sup>22</sup>

To comply with this mandatory duty, it is critical that the assessment effectively evaluate the potential need and opportunity for additional designated areas. Unfortunately, some early assessments under the 2012 planning rule have failed to do so.<sup>23</sup> The best effort so far to comply with this requirement was done by the Rio Grande National Forest.<sup>24</sup> To effectively evaluate the potential need and opportunity for additional designated areas, we recommend that the assessment identify and strive to answer the following questions:

- 1) What areas of the Monument outside of designated wilderness have roadless character (both inventoried and un-inventoried)?
- 2) What ecosystem and habitat types exist across the Monument, and what are their levels of protection within the PSINF and RGFO? What types are least represented in designated areas?
- 3) What unique features, values, or resources exist across the Monument – including but not limited to the examples listed below – and what is their current status of protection?
  - Botanical, geological, historical, cultural, paleontological, recreational, scenic, aquatic, or zoological resources
  - Climate refugia, migratory corridors, rivers and streams, and other features that enhance species protection and habitat connectivity
- 4) Do existing Research Natural Areas satisfy the objectives listed in Forest Service Manual 4063.02?
- 5) What are the socio-economic factors relevant to administratively protecting lands through conservation designations (e.g., recreation trends, public sentiment, etc.)?

This list of recommended questions is non-exclusive and is intended to focus the assessment on the relevant substantive and procedural requirements of the 2012 rule, the corresponding directives contained in Forest Service Handbook (FSH) 1909.12, and other federal laws and policies. Each of the questions is addressed in more detail below. Collectively, the answers to the questions, as informed by the best available science, demonstrate a potential need and opportunity for additional designated areas – including recommended wilderness and lands with wilderness characteristics – on the Monument.

---

<sup>22</sup> 36 C.F.R. § 219.7(c)(2)(v)-(vii). The 2012 rule defines “designated area” as “[a]n area or feature identified and managed to maintain its unique special character or purpose.” *Id.* § 219.19. The definition further explains that “[s]ome categories of designated areas may be designated only by statute and some categories may be established administratively in the land management planning process or by other administrative processes of the Federal executive branch.” *Id.* (listing examples of statutorily and administratively designated areas).

<sup>23</sup> See, e.g., Final Sierra National Forest Assessment at 199-221, available at [http://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprdb5444580.pdf](http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5444580.pdf) (describing existing designated areas, including their “existing conditions and future trends” and “contribution[s] . . . to “ecological, social or economic sustainability,” but not evaluating potential need and opportunity for *additional* designated areas); Sequoia National Forest Assessment at 201-219 (Dec. 2013), available at [http://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprdb5444840.pdf](http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5444840.pdf) (same).

<sup>24</sup> See Rio Grande National Forest Assessment Report Chapter 15 available at [https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/fseprd489288.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd489288.pdf).

1. What areas of the planning area outside of designated wilderness have roadless character?
  - a. *Policy background related to the identification and protection of undeveloped, roadless lands*

The PSINF and RGFO currently encompasses 723,851 acres of designated wilderness – or about 2% of the two units. Yet, the Monument has significant undeveloped, roadless acreage that may be suitable for additional protection through this planning process. For example, the national forest portion of the Monument has 11,184 acres of Colorado Roadless Areas (CRAs) identified under the 2012 Colorado Roadless Rule.<sup>25</sup> The portion of the Monument comprised of BLM lands has 7,450 acres of Wilderness Study Areas (WSAs). Together, this WSA and CRA acreage is approximately 87% of the Monument. The Monument also contains additional roadless lands outside CRAs and WSAs that should be identified through the wilderness evaluation process. In total, there are likely at least an additional 18,800 acres of potential wilderness-quality lands on the Monument.

As described in more detail below, this undeveloped acreage presents a significant opportunity for the agencies to protect wilderness quality lands either in terms of recommending them wilderness (in the case of the Forest Service), inventorying lands with wilderness characteristics and managing those lands to maintain this character (in the case of the BLM), or other conservation designations available to both agencies to enhance the myriad ecological and social benefits associated with conservation of roadless lands.

Additionally, a robust assessment of the need and opportunity to further protect these roadless lands through administrative designations is an integral prerequisite to satisfy the Forest Service and BLM's substantive regulatory and statutory obligations. The Forest Service's 2012 planning rule requires the agency to provide for ecological integrity, species diversity, and social, economic, and ecological sustainability.<sup>26</sup> As the Forest Service has recognized, such roadless areas "provide large, relatively undisturbed blocks of habitat for a variety of terrestrial and aquatic wildlife and plants, including hundreds of threatened, endangered, or sensitive species[,] . . . function as biological strongholds and refuges for a number of species, and . . . play a key role in maintaining native plant and animal communities and biological diversity."<sup>27</sup>

As for the BLM, the Federal Land Policy Management Act (FLPMA),<sup>28</sup> imposes a duty on the agency to identify and protect the many natural resources found in the Monument. FLPMA requires BLM to inventory its lands and their resource and values, "including outdoor recreation and scenic values."<sup>29</sup> FLPMA also obligates BLM to take this inventory into account when preparing land use plans, using and observing the principles of multiple use and sustained yield.<sup>30</sup> Through management plans,

---

<sup>25</sup> 77 Fed. Reg. 39576 (July 3, 2012).

<sup>26</sup> See 36 C.F.R. §§ 219.8-219.9.

<sup>27</sup> Roadless Area Conservation Rule, Final Environmental Impact Statement, Summary, at 17, available at <http://www.fs.usda.gov/roaddocument/roadless/2001roadlessrule/finalruledocuments>.

<sup>28</sup> 43 U.S.C. § 1701 *et seq.*

<sup>29</sup> 43 U.S.C. § 1711(a).

<sup>30</sup> 43 U.S.C. § 1712(c)(4); 43 U.S.C. § 1712(c)(1).

BLM must protect wildlife, scenic values, recreation opportunities and wilderness characteristics on the public lands through various management decisions, including by excluding or limiting certain uses of the public lands.<sup>31</sup> FLPMA also directs the agency “take any action necessary to prevent unnecessary or undue degradation of the lands.”<sup>32</sup>

Protecting roadless lands in the Monument using administrative designations, including wilderness recommendations and managing lands with wilderness character, is an appropriate, important and necessary action to satisfy both agencies’ substantive duties.

- b. Establishing additional designated areas to conserve undeveloped lands will help address current ecological needs relevant to biodiversity, connectivity, and climate change adaptation.*

While many of the studies referenced in this section pertain to Forest Service Inventoried Roadless Areas (IRAs), the findings from these studies are relevant to all large undeveloped lands, including BLM roadless areas.

Undeveloped natural lands provide numerous ecological benefits. They safeguard biodiversity, enhance ecosystem representation (see discussion below), facilitate connectivity (Loucks *et al.* 2003; USDA Forest Service 2001; Crist *et al.* 2005; Wilcove 1990; The Wilderness Society 2004; Strittholt and DellaSala 2001; DeVelice and Martin 2001), and provide high-quality or undisturbed water, soil, and air resources (Anderson *et al.* 2012; DellaSala *et al.* 2011). They also serve as ecological baselines to facilitate better understanding of our impacts to other landscapes (Arcese and Sinclair 1997).

Forest Service roadless lands are heralded for their conservation values. Those values are described at length in the preamble of the Roadless Area Conservation Rule (RACR)<sup>33</sup> and in the Final Environmental Impact Statement for the RACR.<sup>34</sup> They include: high-quality or undisturbed soil, water, and air; sources of public drinking water; diverse plant and animal communities; habitat for threatened, endangered, proposed, candidate, and sensitive species and for those species dependent on large, undisturbed areas of land; primitive, semi-primitive non-motorized, and semi-primitive motorized classes of dispersed recreation; reference landscapes; natural appearing landscapes with high scenic quality; traditional cultural properties and sacred sites; and other locally identified unique characteristics (e.g., uncommon geological formations, unique wetland complexes, exceptional hunting and fishing opportunities).

Numerous articles in the scientific literature similarly recognize the contribution of roadless and undeveloped lands to biodiversity, connectivity, and conservation reserve networks. For example, Loucks *et al.* (2003) examined the potential contributions of roadless areas to the conservation of biodiversity, and found that more than 25% of IRAs are located in globally or regionally outstanding ecoregions<sup>35</sup> and that 77% of IRAs have the potential to conserve threatened, endangered, or imperiled

---

<sup>31</sup> See 43 U.S.C. § 1712(e).

<sup>32</sup> 43 U.S.C. §1732(b).

<sup>33</sup> 66 Fed. Reg. at 3245-47.

<sup>34</sup> Final Environmental Impact Statement, Vol. 1, 3-3 to 3-7, available at <http://www.fs.usda.gov/roaddocument/roadless/2001roadlessrule/finalruledocuments>.

<sup>35</sup> Loucks *et al.* utilized an ecosystem ranking system developed by Ricketts *et al.* (1999):

species. Arcese and Sinclair (1997) highlighted the contribution that IRAs could make toward building a representative network of conservation reserves in the United States, finding that protecting those areas would expand eco-regional representation, increase the area of reserves at lower elevations, and increase the number of large, relatively undisturbed refugia for species. Crist *et al.* (2005) looked at the ecological value of roadless lands in the Northern Rockies and found that protection of national forest roadless areas, when added to existing federal conservation lands in the study area, would: (1) increase the representation of virtually all land cover types on conservation lands at both the regional and ecosystem scales, some by more than 100%; (2) help protect rare, species-rich, and often-declining vegetation communities; and (3) connect conservation units to create bigger and more cohesive habitat “patches.”

Roadless lands are also responsible for higher quality water and watersheds. Anderson *et al.* (2012) assessed the relationship of watershed condition and land management status, and found a strong spatial association between watershed health and protective designations. DellaSala *et al.* (2011) found that undeveloped and roadless watersheds are important for supplying downstream users with high-quality drinking water, and that developing those watersheds comes at significant costs associated with declining water quality and availability. The authors recommend a light-touch ecological footprint to sustain healthy watersheds and the many other values that derive from roadless areas.

Dickson *et al.* (2014) conducted an analysis to identify priority roadless areas across BLM lands. Their analysis found that many of the BLM’s remaining roadless lands possess high ecological value. The analysis considered species richness, vegetation community diversity, topographic complexity, and surface water availability when measuring ecological value.

2. What ecosystem and habitat types exist across the planning area, and what are their levels of protection within the PSINF and RGFO? What types are least represented in designated areas?

As described in more detail in Appendix 1, protection of diverse ecosystem and habitat types through wilderness and other designations is a cornerstone of regional, national, and international efforts to conserve biological diversity and ecological processes of natural ecosystems (Bertzky *et al.* 2012). For protected areas to conserve genetic, species, and community diversity – as well as the composition, structure, function, and evolutionary potential of natural systems – they must encompass the full variety

---

Ricketts *et al.* (1999) classified the biological importance of each ecoregion based on species distribution, i.e., richness and endemism, rare ecological or evolutionary phenomena such as large-scale migrations or extraordinary adaptive radiations, and global rarity of habitat type, e.g., Mediterranean-climate scrub habitats. They used species distribution data for seven taxonomic groups: birds, mammals, butterflies, amphibians, reptiles, land snails, and vascular plants (Ricketts *et al.* 1999). Each category was divided into four rankings: globally outstanding, high, medium, and low. The rankings for each of the four categories were combined to assign an overall biological ranking to each ecoregion. Ecoregions whose biodiversity features were equaled or surpassed in only a few areas around the world were termed “globally outstanding.” To earn this ranking, an ecoregion had to be designated “globally outstanding” for at least one category. The second-highest category, or continentally important ecoregions, were termed “regionally outstanding,” followed by “bioregionally outstanding” and “nationally important” (Ricketts *et al.* 1999).



of ecosystems (Olson and Dinerstein 1998; Margules and Pressey 2000). Indeed, protecting ecosystem diversity is a central purpose of forest planning under the 2012 planning rule:

Plans will guide management of [National Forest System] land so that they are ecologically sustainable and contribute to social and economic sustainability; ***consist of ecosystems and watersheds with ecological integrity and diverse plant and animal communities***; and have the capacity to provide people and communities with ecosystem services and multiple uses that provide a range of social, economic, and ecological benefits for the present and into the future.<sup>36</sup>

To that end, the assessment's evaluation of the potential need and opportunity for additional designated areas should consider whether there are "specific land types or ecosystems present in the plan area that are not currently represented or minimally represented."<sup>37</sup> That analysis of ecosystem representation in turn will help inform the agencies' determination during the plan revision process whether to designate or recommend for designation additional areas.<sup>38</sup> It will assist the Forest Service in satisfying its substantive planning mandates to provide for ecological sustainability and integrity and "the diversity of plant and animal communities and the persistence of native species."<sup>39</sup> And it will assist the BLM in satisfying its planning mandates to protect natural resources.<sup>40</sup>

To provide the agencies with what we believe to be the best available science on this issue, we conducted an analysis of ecosystem representation in the National Wilderness Preservation System (NWPS) at the national and local scales (Appendix 1; Dietz *et al.* 2015; Belote *et al.* 2015). That analysis shows that the NWPS suffers from a significant under-representation of many ecosystems.

Specific to the Browns Canyon National Monument, our analysis shows that a majority of the two roadless units are comprised of inadequately represented ecosystems at both regional and national scales (Tables 1 & 2; Maps 2 & 3). Underrepresented ecosystems cover approximately 86% of the Aspin Ridge CRA on both regional and federal levels of representation. On the WSA Adjacent BLM Roadless Lands, the case is even more severe, with underrepresented ecosystems composing over 96% of the total area.

Our analysis found that only 3 of the 20 ecosystem types found on Browns Canyon are adequately represented in wilderness at the regional level (Table 3, Tab 2). Under-represented ecosystem types span over 92% of the Monument, with severely under-represented ecosystem types (<5%) covering 72% of the entire Monument area.

---

<sup>36</sup> 36 C.F.R. § 219.1(c) (emphasis added).

<sup>37</sup> FSH 1909.12, ch. 10, § 14(4)(c).

<sup>38</sup> See, e.g., FSH 1909.12, ch. 70, § 72.1(4) (agency must "[e]valuate the degree to which [potential wilderness areas] may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value," which "may include[ r]are plant or animal communities or rare ecosystems").

<sup>39</sup> 36 C.F.R. §§ 219.8-219.9; see also *id.* § 219.9(a)(2) (plans "must include plan components . . . to maintain or restore the diversity of ecosystems and habitat types").

<sup>40</sup> See *supra* n. 28 - 32.

The story is similar at the national scale, with a total of 16 inadequately represented ecosystem types covering over 92% of Browns Canyon (Table 3, Tab 3; Map 2). Ecosystem types with less than 5% representation at the national scale cover 55% of the entire Monument, while ecosystem types with less than 10% representation at that scale cover approximately 73% of the forest.

Notably, many under-represented ecosystem types in Browns Canyon are also some of the most common (Table 3, Tabs 2 & 3). The most abundant ecosystem on the Monument, the Southern Rocky Mountain Pinyon-Juniper Woodland, spans over 11,000 acres (over half of the Monument area) and falls in the most severe category of inadequate representation on both regional and national scales (< 5%). Further, the remaining top five ecosystems with the most coverage on Browns Canyon are underrepresented on both federal and regional levels, with three of those ecosystems falling into the most severe category of underrepresentation on the regional level. These include the Southern Rocky Mountain Ponderosa Pine Woodland, the Southern Rocky Mountain Dry-Mesic Mixed Conifer Forest and Woodland, the Southern Rocky Mountain Mesic Montane Mixed Conifer Forest and Woodland, and the Southern Rocky Mountain Montane-Subalpine Grassland.

The attached maps and tables depict these results in detail, showing the following:

- Map 1 “Browns Canyon NM Roadless Lands”: Depicts each the roadless lands of Browns Canyon alongside the Browns Canyon BLM Wilderness Study Area.
- Map 2 “Ecosystem Representation on the Federal Level”: Color depiction of the results of Equation 1 (above), showing the level of representation in the NWPS of each ecosystem type at the national scale. For example, areas shown in red depict ecosystems that are represented in the NWPS at less than 5% of all available federal land.
- Map 3 “Ecosystem Representation on the Regional Level”: Color depiction of the results of Equation 2 (above), showing the level of representation in the NWPS of each ecosystem type at the forest level.
- Table 1 “Browns Canyon National Monument Roadless Unit Representation Table”: Proportion (%) of each roadless area (Aspin Ridge CRA, WSA Adjacent BLM Roadless Lands) composed of under-represented ecosystem types on Browns Canyon based on national- or forest-level representation. Representation of each ecosystem type was quantified based on all available area on federal land and the individual forest. All ecosystems with <20% representation in the NWPS at each scale were broken into 3 levels of representation (<5%, 5-9.9%, and 10-19.9%). This table allows one to prioritize potential wilderness inventory units by proportion of land area that is composed of under-represented ecosystems, at three levels.
- Table 2 “Browns Canyon National Monument Ecosystem Composition of Roadless Units”: Values within the matrix are the estimated acres of each ecosystem type occurring within each roadless area on Browns Canyon. This table depicts the specific ecosystem composition of each area.
- Table 3, Tabs 1-3 “Browns Canyon National Monument Ecosystems Representation”: These tables depict which ecosystems are under-represented at the forest-level and national scales.

Tab 1 shows a complete list of ecosystem types found on Browns Canyon, and the proportion of each type in the NWPS at the forest-level and national scales. Tabs 2 and 3 show representation breakdowns at the three levels (<5%, 5-9.9%, and 10-19.9%) at the forest-level and national scales.

Overall, our ecosystem representation analysis and results highlight a need and opportunity to conserve under-represented ecosystem types found in the Monument. The land management planning process presents an important opportunity to begin to remedy the under-representation of certain ecosystems in the NWPS – most immediately through an assessment of the need and opportunity for additional designated areas that prioritize protection of ecosystem diversity.

The assessment should document this information. In particular, the assessment should identify the ecosystems under-represented in designated Wilderness on the PSINF and the RGFO, the acres needed to elevate a particular ecosystem into adequate representation, and the amount of each area identified in the inventory of wilderness lands composed of under-represented acres.

3. What unique or special features, values, or resources exist across the forest, and what is their current status of protection?

The Forest Service and BLM both have regulatory and policy direction regarding the identification and management of unique or special features in land management planning.

*a. Forest Service Policy*

The Forest Service’s 2012 planning rule defines designated area as “[a]n area or feature identified and managed to maintain its unique special character or purpose.”<sup>41</sup> Accordingly, to properly assess the need and opportunity for additional designated areas, the assessment must identify those areas and features throughout the Monument with unique, special character and evaluate their current status of protection.

The Forest Service Manual addressing special recreation designations describes *some* of the potential types of special character that may warrant protective designation: areas with “scenic, geological, botanical, zoological, paleontological, archaeological, or other special characteristics or unique values” should be “protect[ed] and manage[d] for public use and enjoyment [as] special recreation areas.”<sup>42</sup> Those six categories, however, are in no way an exhaustive list of the types of special features, values, or resources the Forest Service should identify in the assessment report, and special recreation designations are just one of a slate of potential designations that the agency should consider during the plan revision process.<sup>43</sup> Thus, in addition to scenic, geological, botanical, zoological, paleontological, and archaeological resources, the Forest Service should consider historical and cultural (including tribal)

---

<sup>41</sup> 36 C.F.R. § 219.19.

<sup>42</sup> FSM 2372.02.

<sup>43</sup> See 36 C.F.R. § 219.7(c)(2)(vii) (broad, non-discretionary duty to “[i]dentify existing designated areas other than [Wilderness and Wild and Scenic Rivers]” and “determine whether to recommend any additional areas for designation”); see also, e.g., FSH 1909.12, ch. 20, § 24, Exhibit 01 (providing a non-comprehensive list of “some types of designated areas that the Responsible Official may consider” during the forest plan revision).

resources, aquatic resources, other recreational or educational resources, and any other unique or special features, values, or resources across the forest.

*b. BLM Policy*

Under FLPMA, the BLM must develop and revise land use plans to manage public lands “in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values...[and] where appropriate, will preserve and protect certain public lands in their natural condition....”<sup>44</sup> FLPMA obligates BLM to “give priority to the designation and protection of areas of critical environmental concern [ACECs].”<sup>45</sup> ACECs are areas “where special management is required (when such areas are developed or used or where no development is required) to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes.”<sup>46</sup>

BLM’s ACEC Manual (1613) provides additional detail on the criteria to be considered in ACEC designation, as discussed in the applicable regulations, as well.<sup>47</sup> An area must possess relevance (such that it has significant value(s) in historic, cultural or scenic values, fish & wildlife resources, other natural systems/processes, or natural hazards) and importance (such that it has special significance and distinctiveness by being more than locally significant or especially rare, fragile or vulnerable). In addition, the area must require special management attention to protect the relevant and important values.

*c. Factors to consider when identifying the need and opportunity for designated areas*

In identifying and assessing unique and outstanding areas and features, the Forest Service and BLM should take a broad and inclusive approach. The assessment of areas and features with unique, special character should consider those values explicitly listed in their directives as well as climate refugia, migratory corridors, rivers and streams, and other features that enhance species protection and habitat connectivity. As described above, a robust, connected network of protected conservation lands is necessary to satisfy both agencies’ substantive mandates.<sup>48</sup> Particularly as climate change alters and makes more vulnerable ecological systems, habitats, and species composition and distribution, there is an acute need to conserve migratory corridors, replication and representation within protected areas, larger protected tracts, and more connections between them (Mawdsley *et al.* 2009). In this context, and given their numerous environmental and social benefits, the assessment should recognize the unique, special character of roadless and other undisturbed lands.

In identifying areas and features with unique special character, the Forest Service and BLM should make sure to assess information on biodiversity and ecologically important areas. For example, the assessment should include information from the Colorado Natural Heritage Program on species and

---

<sup>44</sup> 43 U.S.C. §1701(a)(8).

<sup>45</sup> 43 U.S.C. § 1712(c)(3).

<sup>46</sup> 43 U.S.C. § 1702(a).

<sup>47</sup> See, BLM Manual 1613 at .1 (Characteristics of ACECs); 43 C.F.R. § 8200.

<sup>48</sup> See 36 C.F.R. §§ 219.8 – 219.9 for Forest Service mandates; See 43 U.S.C. §§ 1712(e) and 1732(b) for BLM mandates.

potential conservation areas – areas that focus on capturing the ecological processes that are necessary to support the continued existence of a particular element of natural heritage significance. Potential conservation areas may include a single occurrence of a rare element or a suite of rare elements or significant features.<sup>49</sup> We are told that the Forest Service Region 2 office has purchased this data to inform land management planning within Colorado.

Wild Connections has identified lands with wilderness characteristics totaling approximately 246,000 acres over 24 areas in the RGFO. A portion of one of these inventory areas -- Browns Canyon South LWC -- resides within the Monument boundary. The Browns Canyon South LWC consists of approximately 2,500 acres and is located directly adjacent to the Browns Canyon WSA. Wild Connections has shared iterations of its inventory, including written inventory reports and discussions with the RGFO staff, to inform the development of the Eastern Colorado RMP. You will find Wild Connections wilderness inventory report attached as appendix 2; we request that you review this report for information about the Browns Canyon South LWC.

This inventory information meets the criteria laid out in Manual 6310 as the “Minimum Standard for Review of New Information”:

- i. A map of sufficient detail to determine specific boundaries of the area in question;
- ii. A detailed narrative that describes the wilderness characteristics of the area and documents how that information substantially differs from the information in the BLM inventory of the area’s wilderness characteristics; and
- iii. Photographic documentation.

BLM Manual 6310 at .06(B)(1)(b). BLM should therefore consider this information to be part of a formal citizen-proposed LWC inventory, and should specifically respond to submitted data as part of the comment response portion of the RMP development. BLM’s evaluation of this data should meet the requirements set forth in Manual 6310, which include documenting the rationale for BLM’s findings, making the findings available to the public and retaining a record of the evaluation and the findings as evidence of BLM’s consideration. BLM Manual 6310 at .06 (B)(2).

In addition to this incredibly useful data source, the Planning Team should include information from other regional ecological analyses. These include:

- The Southern Rockies Wildlands Network Vision.<sup>50</sup> A collaborative effort between the Denver Zoo, the Southern Rockies Ecosystem Project, and the Wildlands Project, the Vision presents the case for a conservation network of lands, and proposes tangible steps for implementing it. Designated areas can supplement Wilderness, recommended Wilderness, and Research Natural

---

<sup>49</sup> See <http://www.cnhp.colostate.edu/download/dictionary/Data%20Dictionary%20for%20PCA%20Reports.pdf>.

Individual PCA reports are available at: [http://www.cnhp.colostate.edu/download/gis/pca\\_reports.asp](http://www.cnhp.colostate.edu/download/gis/pca_reports.asp). GIS data are available at: <http://www.cnhp.colostate.edu/download/gis.asp>.

<sup>50</sup> Miller, Brian, Michelle Fink, Doug Shinneman, Dave Foreman, Jean Smith, Margaret DeMarco, Michael Soule, and Robert Howard, 2003. Southern Rockies Wildlands Network Vision, A Science-Based Approach to Rewilding the Southern Rockies. Available at [https://www.researchgate.net/publication/280624193\\_Southern\\_Rockies\\_Wildlands\\_Network\\_Vision\\_A\\_science-based\\_approach\\_to\\_rewilding\\_the\\_Southern\\_Rockies](https://www.researchgate.net/publication/280624193_Southern_Rockies_Wildlands_Network_Vision_A_science-based_approach_to_rewilding_the_Southern_Rockies).

Areas in filling out a conservation network designed to maintain, restore and protect species and habitats of concern.

- The Colorado State Wildlife Action Plan (SWAP).<sup>51</sup> Developed as a collaborative endeavor by the Colorado Department of Parks and Wildlife, the SWAP uses statewide data sets to identify the top priority species and habitats that need conservation efforts in the state, and the potential conservation actions that can address the threats these species and habitats face. Chapter 8 offers a series of maps to help guide conservation efforts across the state. The first six maps indicate relative condition of freshwater, terrestrial upland, and wetland/riparian habitats. This information can be used to identify areas at a broad scale that are likely to be in higher quality condition, and therefore good candidates for land protection strategies, as well as those that are more likely in degraded condition and in need of restoration. The last two maps display Species of Greatest Conservation Need concentration areas for aquatic and terrestrial species, respectively. These maps are useful for broad-scale analysis of where conservation efforts might be most warranted and most successful. All of these maps are very useful in identifying places that might benefit from a conservation designation and further the Forest Service's 2012 planning rule's species requirements.
- The Nature Conservancy's Southern Rocky Mountains: An Ecological Assessment and Conservation Blueprint.<sup>52</sup> The Nature Conservancy convened a multi-state team in January, 2000, to compile and analyze biological and ecological data and develop an ecoregional assessment for the Southern Rocky Mountains, with funding from the U.S. Forest Service, Colorado Division of Wildlife, and the Bureau of Land Management. The objective of this assessment was to use a science-based approach to design a portfolio of conservation areas for the Southern Rocky Mountains that, with proper management, would ensure the long-term persistence of the ecoregion's species, communities, and ecological systems. The ultimate goal is to conserve the full portfolio of conservation areas identified through this assessment process.<sup>53</sup>
- The Nature Conservancy's Rare Plant Conservation Strategy.<sup>54</sup> The first recommended action in this strategy is to "Secure on-the-ground, site-specific habitat protection and/or management for all of Colorado's imperiled plants." Designating administrative conservation areas in land management plans can be a useful mechanism to do this. Page 29 provides a map of rare plant areas in Colorado based on CNHP data.

Consistent with the requirement under the Forest Service's 2012 planning rule that plans provide for sustainable recreation and opportunities to connect people with nature,<sup>55</sup> the assessment should also include information from the Forest Service's 2010 Framework for Sustainable Recreation when identifying special features, values, and resources. The framework highlights the importance of investing

---

<sup>51</sup> The SWAP is available at <http://cpw.state.co.us/aboutus/Pages/StateWildlifeActionPlan.aspx>.

<sup>52</sup> Available at: [http://azconservation.org/dl/TNCAZ\\_Ecoregions\\_Assessment\\_Southern\\_Rocky\\_Mtns.pdf](http://azconservation.org/dl/TNCAZ_Ecoregions_Assessment_Southern_Rocky_Mtns.pdf).

<sup>53</sup> *Ibid.* Pages xi-xii.

<sup>54</sup> Neely, B., S. Panjabi, E. Lane, P. Lewis, C. Dawson, A. Kratz, B. Kurzel, T. Hogan, J. Handwerk, S. Krishnan, J. Neale, and N. Ripley. 2009. Colorado Rare Plant Conservation Strategy. Developed by the Colorado Rare Plant Conservation Initiative. The Nature Conservancy, Boulder, Colorado. 88 pp. Available at

<http://www.conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/Colorado/Pages/corareplant.aspx>.

<sup>55</sup> 36 C.F.R. §§ 219.8(b)(2) & (6), 219.10(b)(i).

in special places and commits the agency to “evaluat[ing] other areas within the National Forest System that have outstanding recreational, scenic, historic, or other values of high attractiveness for designation and management as special areas” (USDA Forest Service 2010a). More generally, the assessment of recreation settings, opportunities and access, and scenic character should be integrated into the assessment of the need and opportunity for additional designations.<sup>56</sup>

More specifically, the Monument boasts a treasure trove of unique and special features, values, and resources including, among many others:

- In central Colorado's vibrant upper Arkansas River valley, the rugged granite cliffs, colorful rock outcroppings, and stunning mountain vistas of Browns Canyon form an iconic landscape that attracts visitors from around the world.
- The protected land in the Canyon provides clean water and a unique ecosystem that are important to sustain fishing opportunities.
- This section of the Arkansas River is part of the longest section of Gold Medal river in Colorado.
- The Browns Canyon section of the Arkansas River, which includes class II and class III rapids, is the most popular whitewater section in the U.S.
- The area provides four-season recreation opportunities, including world class river rafting, hunting, fishing, hiking, camping, mountain biking, and horseback riding.
- The Canyon contains one of the last remaining relatively undisturbed riparian ecosystems in Colorado.
- The Monument provides important habitat for wildlife, including black bears, bighorn sheep, elk, mule deer, American pine martins, mountain lions, golden eagles, peregrine falcons, imperiled bats, boreal toad, northern leopard frog and many other species.
- There are 18 known archaeological sites that are at least 13,000 years old within the Monument, including 5 prehistoric open lithic sites that have been determined to be eligible for the National Register of Historic Places.

#### 4. Do existing Research Natural Areas satisfy the objectives listed in Forest Service Manual 4063.02?

A Research Natural Area (RNA) is “[a] physical or biological unit in which current natural conditions are maintained insofar as possible . . . by allowing natural physical and biological processes to prevail without human intervention.”<sup>57</sup> RNAs should be “large enough to provide essentially unmodified conditions within their interiors . . . and to protect the ecological processes, features, and/or qualities for which the [RNAs] were established.”<sup>58</sup> As Forest Service Manual 4063.1 explains, “[l]andscape-scale [RNAs] that incorporate several ecosystem elements are ideal, where feasible.” Collectively, RNAs comprise “a national network of ecological areas designated in perpetuity for research and education and/or to maintain biological diversity.”<sup>59</sup>

Forest Service Manual 4063.02 enumerates eight objectives for establishing RNAs:

---

<sup>56</sup> See 36 C.F.R. § 219.6(b)(9); Section V below.

<sup>57</sup> FSM 4063.05.

<sup>58</sup> FSM 4063.1.

<sup>59</sup> FSM 4063.

- 1) Maintain a wide spectrum of high quality representative areas that represent the major forms of variability . . . that, in combination, form a national network of ecological areas for research, education, and maintenance of biological diversity
- 2) Preserve and maintain genetic diversity
- 3) Protect against human-caused environmental disruptions
- 4) Serve as reference areas for the study of natural ecological processes including disturbance
- 5) Provide onsite and extension educational activities
- 6) Serve as a baseline area for measuring long-term ecological changes
- 7) Serve as control areas for comparing results from manipulative research
- 8) Monitor effects of resource management techniques and practices

As described above and highlighted by these objectives, a robust, connected network of protected natural areas that represent the full spectrum of ecosystem and habitat types is critical to conserving biological diversity and enhancing climate change adaptation. Such a network is especially important for purposes of scientific observation and study in light of anticipated alternations in vegetation and species types and distributions related to climate change.

Accordingly, to properly assess the need and opportunity for additional RNAs, the assessment should evaluate and document whether the size, distribution, and representation of the PSINF's existing RNAs satisfy each of the objectives enumerated in Forest Service Manual 4063.02. In doing so, the Forest Service should pay particular attention to: the need for and adequacy of connectivity between existing RNAs; how or whether those RNAs fit into a larger network of protected lands and corridors; and whether the RNAs encompass entire small drainages,<sup>60</sup> exist or could be extended to a landscape scale,<sup>61</sup> and are large enough to continue to represent the identified ecosystem(s) even with anticipated climate change effects. In addition, the Forest Service should compare its RNA network to state natural resource assessment priority areas and biodiversity data to identify potential deficiencies, and share that information in the assessment.

5. What are the socio-economic factors relevant to protecting public lands through conservation designations (e.g., recreation trends, public sentiment, etc.)?

In addition to their ecological values, areas protected through conservation-oriented designations, including wilderness, contribute to social and economic well-being. A proper assessment of the need and opportunity for additional designated areas must identify and evaluate these benefits. In particular, the assessment should consider recent trends in recreation, public opinion and values, and the economic contributions associated with wilderness and other conservation designations. A robust assessment of those benefits is a necessary prerequisite to satisfaction of the Forest Service's substantive planning mandate to provide for social and economic sustainability, including sustainable recreation, ecosystem services, and opportunities to connect people with nature.<sup>62</sup>

---

<sup>60</sup> FSM 4063.2 ("Where possible, select entire small drainages because they maintain interrelationships of terrestrial and aquatic systems.").

<sup>61</sup> FSM 4063.1. ("Landscape-scale Research Natural Areas that incorporate several ecosystem elements are ideal, where feasible").

<sup>62</sup> 36 C.F.R. § 219.8(b).



a. *Public opinion shows a need for additional wilderness.*

Surveys consistently show that Americans value wilderness and generally favor the designation of additional wilderness. For instance,

- In Chapter 7 of Cordell's *Multiple Values of Wilderness* (2005), Schuster *et al.* addressed the social values of wilderness by looking at survey results at the national, regional, and state levels. They found that: (a) overall there is consensus across groups within the American population that there is not enough wilderness, regardless of how the data are stratified; (b) residents generally support designating more wilderness in their respective states; and (c) Americans are willing to make unspecified monetary tradeoffs to gain additional wilderness.
- As of 2006-2007, more than two-thirds of American citizens (67%) nationally supported the designation of additional wilderness in their home state (Cordell 2008b).<sup>63</sup>
- As of 2001, the majority of Americans felt that the current percentage of the National Forest System designated as wilderness was not enough (Scott 2003).<sup>64</sup>
- Over half of Americans (almost 51%) indicated there is not enough wilderness, while only 4% expressed the opinion that there is too much (Cordell 2008b).<sup>65</sup>
- Americans are willing to accept higher costs for electricity, gasoline, and other consumer products to have more wilderness lands designated and to have higher quality air over and near wilderness (Scott 2003).

At a regional level, we see that:

- 70% of west slope Colorado residents support efforts to protect additional deserving public lands as wilderness in or near the county where they live.<sup>66</sup>
- 71% agree wilderness-quality lands are more important for recreation, tourism, and wildlife than for energy development. Majority support was found across all geographical regions and party affiliations (85% Democrat support, 76% Independent support, and 52% Republican support).<sup>67</sup>

---

<sup>63</sup> When asked how they felt about designating more of the federal lands as wilderness in their home state, 67% of National Survey on Recreation and the Environment (NSRE) respondents indicated they somewhat or strongly favor more.

<sup>64</sup> Question: "Currently, 18% of the land in the United States' national forests is permanently protected from logging and other development. Do you think the U.S. has too much permanently protected areas in the national forests, not enough protected areas in the national forest, or the right amount of permanently protected areas in the national forests, or aren't you sure about that?" N=1,000 likely voters.

<sup>65</sup> NSRE respondents were asked their opinions about whether they saw the amount of federal land now designated as wilderness as too little, about right, or too much. Over half in 2006-2007 (almost 51%) indicated there is not enough wilderness, and 35% indicated the amount is about right. Only 4% expressed the opinion that there is already too much.

<sup>66</sup> See attached survey results of survey conducted by Talmey-Drake Research & Strategy, Inc., a public opinion and market research firm in Boulder, Colorado. (Appendix 3).

<sup>67</sup> Ibid.

- Wilderness areas or open lands with little to no development and opportunity for solitude were ranked very to extremely important by 70% of Coloradans, higher than any other category of outdoor recreation area. In the South Central area (which is the area within which the Monument falls); walking, hiking/backpacking, and jogging were the highest trail-based activities, with OHV and off-road motorcycle use at the bottom (Colorado Parks and Wildlife 2014).
- 90% agree that wilderness areas were important economically for the hunting, fishing, and tourism they support.<sup>68</sup>
- 71% believe that wilderness areas should not be sacrificed for energy development, and that clean energy alternatives should be pursued instead. In a different question, only 33% of respondents agree that wilderness-quality lands are needed for domestic energy development.<sup>69</sup>
- 85% of Coloradoans report that Wilderness areas or open lands with little to no development and opportunity for solitude are moderately to very important to them, while 53% felt it was extremely important (Colorado Parks and Wildlife 2014).
- 90% of Coloradoans feel that Wilderness areas or open lands with little to no development and opportunity for solitude are a moderate to high priority for future investment, while 45% felt it was an essential priority.<sup>70</sup>
- 81% of Coloradoans feel that nature or wildlife viewing areas should be a moderate to high future investment priority in their local communities.<sup>71</sup>
- The results from the 2012 Colorado College State of the Rockies Conservation in the West poll found that Colorado voters across the political spectrum view Colorado’s parks and public lands as essential to the state’s economy. Of voters surveyed, 93 percent agreed that “Our national parks, forests, monuments, and wildlife areas are an essential part of Colorado’s economy.” And 75% said that Colorado should maintain protections for land, air and water in the state rather than reduce them in an effort to create jobs as quickly as possible (Colorado College 2012).
- Nearby Huerfano County conducted a poll to inform the development of a Master Trail Plan, and the poll found that people would prefer to travel to parks, wilderness areas, cultural areas, and high elevation areas during recreation activities.<sup>72</sup>
- *Salida Parks, Recreation Trails and Open Space Master Plan*: “Without a doubt, residents of Salida value the majestic views and outdoor recreation opportunities that surround them.” The

---

<sup>68</sup> Ibid.

<sup>69</sup> Ibid.

<sup>70</sup> Colorado Parks and Wildlife 2014. Question 12.

<sup>71</sup> Ibid. Question 13.

<sup>72</sup> Huerfano County Master Trail Plan at 9. Available at <http://www.huerfano.us/uploads/hctp.pdf>.

plan also lists “development changing access to public lands” as a threat to the Salida community.<sup>73</sup>

- The Arkansas River Stage and Rail Trail Plan states that: “Although local statistics are not readily available it is evident that in the past 15-20 years there has been a huge increase in local interest in non-motorized trails... Each (town) has similarly invested in hiking, horseback and cycling trails adjacent to their communities. These trail systems have been universally accepted as prime community assets. In addition, they are commonly cited by town officials as significant contributors not only to local citizen enjoyment and fitness but also to the attractiveness of these communities to tourism and prospective business investors and residential buyers.”<sup>74</sup>

*b. Participation in outdoor, nature-based recreation is steady or on the rise.*

Recreational surveys show that Americans are participating in increasing numbers in recreational pursuits that natural areas such as wilderness provide. According to Cordell (2008b), both the total number of Americans participating and the total number of days annually in which we participate in nature-based recreation have grown since 1994. For example, viewing, photographing, and studying nature (e.g., wildlife and birds), have grown strongly, while primitive camping and backpacking days increased 12% and 24%, respectively, between 2000 and 2008 (Cordell 2008b).

In addition, a significant percentage of Americans participate in outdoor recreation. For instance,

- Across the country, an estimated 35% of Americans, both urban and rural residents, participated in birding between 2004 and 2007 (Cordell 2008c).
- More than 90 million U.S. residents participated in some form of wildlife-related recreation in 2011. Participation is up three percent from five years earlier: the number of Americans who hunted or fished rose from 33.9 million in 2006 to 37.4 million in 2011. 27 million freshwater anglers logged an average of 16 days of fishing each in 2011 (USDOI Fish & Wildlife Service 2011a).
- Americans take between 16 and 35 million trips to wilderness each year on their own or with a guide to hike, backpack, camp, climb mountains, ride horses, ski, raft, canoe, take pictures, view wildlife, or stargaze (Cordell 2005).
- Water paddling sports are popular in the United States, with 10.3 million people participating in kayaking and 3.7 million people participating in rafting – about six percent of the population (Outdoor Foundation 2013). According to National Visitor Use Monitoring data, about three percent of National Forest visitors participate in non-motorized water sports.

Specific to Colorado, recent surveys demonstrate that Coloradoans are very active in the outdoors:

- Coloradoans are outdoor recreation enthusiasts. In 2013, 90% of Coloradans reported participating in some form of outdoor recreation in Colorado in the previous year, about 66%

---

<sup>73</sup> <http://salidarec.com/wp-content/uploads/2010/03/4IdentifiedNeeds.pdf>.

<sup>74</sup> <http://garna.org/stageandrail/>

reported recreating in the outdoors at least one day a week on average, and 60% said that they will either greatly increase or somewhat increase their participation in outdoor recreation over the next five years.<sup>75</sup>

- Wilderness-compatible activities are the most popular outdoor recreation pursuits of Coloradoans with hiking, walking, hiking/backpacking, picnicking, and fishing making up the four most popular outdoor recreation activities, as calculated by total statewide activity days, in each one of the state's regions. Tent camping is the most popular overnight accommodation.<sup>76</sup>

Specific to the PSINF, non-motorized recreation is by far the dominate use on the forest. (USDA Forest Service 2011b). Based on the most recent National Visitor Use Monitoring (NVUM) survey, only about 6.5% of visitors participate in ORV use as their primary recreation activity. Meanwhile, nearly 30% participate in hiking and bicycling as their primary recreation activity. Another 14% stated that viewing natural features is their primary activity.

*c. Wilderness visitation is predicted to continue growing.*

- The number of days Americans visited wilderness and other primitive areas increased 12% between 2000 and 2008. The number of participants visiting a wilderness area increased 3% in the same time period (Cordell 2008a).
- Bowker predicts that population growth in expanding cities in the West and Southwest in particular will result in increased use in wildernesses in the vicinity (Bowker *et al.* 2006).
- It can also be expected that population increases in the communities adjacent to national forests will occur because of their attractiveness in terms of the availability of quality outdoor recreation experiences, clean air and water, and a natural setting (USDA Forest Service 2005).

*d. Economic benefits of protected public lands.*

Based on a wealth of existing, scientifically validated research, the general rule is that there is a neutral-to-positive relationship between the presence and extent of wilderness and other protected areas on one hand, and the economic performance of local economies and economic benefits available to nearby residents on the other. See Appendix 4 for a review of studies. Here are a few examples from this body of research:

- Protected lands such as wilderness are vital economic assets to the western communities that are prospering the most (Rasker *et al.* 2004).
- From 1970 to 2010, western non-metro counties with more than 30% of their land base in federal protected status increased jobs by 345%. As the share of federal lands in protected status goes down, the rate of job growth declines as well. Non-metro counties with no

---

<sup>75</sup> Colorado Parks and Wildlife 2014. Questions 2 and 14.

<sup>76</sup> Colorado Parks and Wildlife 2014. 2013 Outdoor Recreation Participation Public Survey Summary Report. Page 2.

protected federal land increased jobs by 83% over the same time period (Headwaters Economics 2012).

- Protected public lands play an important role in stimulating local economic growth – especially when combined with access to markets and an educated workforce – and are associated with some of the fastest growing communities in the West (Rasker 2006; Rasker *et al.* 2009).
- Wilderness designation enhances nearby private property values (Phillips 2004).
- Wilderness and conservation lands are associated with rapid population, income, and employment growth relative to non-wilderness counties (Lorah and Southwick 2003; Lewis, Hunt, and Plantinga 2002).
- There is no evidence of job losses associated with wilderness, or that counties more dependent on logging, mining, or oil and gas development suffered job losses as a result of wilderness designation in 250 non-urban counties in the Rocky Mountains (Duffy-Deno 1998).
- In 2011 state residents and non-residents spent \$3 billion on wildlife recreation in Colorado (USDOI Fish & Wildlife Service 2011b).
- More than 1.1 million jobs are created nationally through spending on fishing and watersports (Southwick Associates 2012).
- Protected lands have the greatest influence on economic growth in rural isolated counties that lack easy access to larger markets. From 1970 to 2000, real per capita income in isolated rural counties with protected land grew more than 60 percent faster than isolated counties without any protected lands (Rasker 2004).
- Improvements to a river’s flow can increase the tourism value of the area. In a study of the Cache la Poudre River in northern Colorado, the level of fishing and white-water use – and tourists’ willingness to pay for that use – rose and fell depending upon the level of river flow (USDOI National Park Service 2001).

#### **D. Recreation**

##### **1. Identify and evaluate what issues are important for managing recreation**

The Forest Service’s 2012 planning rule requires that plans “provide for . . . [s]ustainable recreation,”<sup>77</sup> considering appropriate placement of infrastructure, such as recreational facilities, and opportunities to coordinate with neighboring landowners to link open spaces and to connect people with nature.<sup>78</sup>

---

<sup>77</sup> 36 C.F.R. § 219.10(b)(1)(i). The rule defines sustainable recreation as “the set of recreation settings and opportunities on the National Forest System that is ecologically, economically, and socially sustainable for present and future generations.” 36 C.F.R. § 219.19.

<sup>78</sup> 36 C.F.R. § 219.10(a)(3), (4) & (10).

Regarding the BLM, FLPMA requires the agency to inventory its lands and their resource and values, "including outdoor recreation and scenic values."<sup>79</sup> FLPMA requires the BLM to protect, through management plans, scenic values and recreation opportunities through various management decisions, including by excluding or limiting certain uses of the public lands.<sup>80</sup>

In the assessment phase, the Forest Service's rule requires the assessments to address "[r]ecreation settings, opportunities, and access, and scenic character," as well as forest infrastructure, including "recreational facilities and transportation . . . corridors."<sup>81</sup> As the Forest Service's planning directives recognize, this requires the Forest Service to identify and evaluate information about existing conditions (e.g., settings, opportunities, access, demands), trends, and sustainability in both the plan area and the broader landscape.<sup>82</sup> The directives provide a very useful list of issues to assess related to settings, opportunities, ecological impacts, connections to nature, etc.<sup>83</sup> This information will be essential for both the Forest Service and BLM to inform the need for change and the development of plan components to meet the agencies' substantive requirements.

Because of the significant potential impact of motorized recreation on ecological integrity, biodiversity, and recreational conflicts and sustainability, it is important that the Forest Service and BLM conduct a robust assessment of this issue. Executive Orders 11644 and 11989 and the Forest Service's Travel Management Rule, 36 C.F.R. part 212 subpart B, which guide the designation and management of off-road vehicle systems, establish that off-road vehicle trails and areas must be located to:

- (1) minimize damage to soil, watershed, vegetation, or other resources of the public lands;
- (2) minimize harassment of wildlife or significant disruption of wildlife habitats; and
- (3) minimize conflicts between off-road vehicle use and other existing or proposed recreational uses of the same or neighboring public lands.<sup>84</sup>

The executive orders also include protective mechanisms to ensure that off-road vehicle designations do not impair the protection of public lands. Specifically, they create a duty to: (1) periodically monitor the effects of off-road vehicle use, and, based on the data, amend or rescind the off-road vehicle designations;<sup>85</sup> and (2) immediately close areas and trails to off-road vehicles where that use "will cause or is causing considerable adverse effects on the soil, vegetation, wildlife, wildlife habitat or cultural or historic resources of particular areas or trails of the public lands" until those effects are eliminated and measures are implemented to prevent future recurrence.<sup>86</sup>

To ensure a robust assessment of recreation settings, opportunities, and access, the Forest Service and BLM in the assessment report should:

---

<sup>79</sup> 43 U.S.C. § 1711(a).

<sup>80</sup> See 43 U.S.C. § 1712(e).

<sup>81</sup> 36 C.F.R. § 219.6(b)(9) & (11).

<sup>82</sup> FSH 1909.12, ch. 10, § 13.4.

<sup>83</sup> FSH 1909.12, ch. 10 § 13.4(1) & (2). Given the comprehensive nature of the directives on assessing recreation, we have not proposed questions related to this topic.

<sup>84</sup> Exec. Order No. 11644, § 3(a), 37 Fed. Reg. 2877 (Feb. 8, 1972), *as amended by* Exec. Order No. 11989, 42 Fed. Reg. 26,959 (May 24, 1977).

<sup>85</sup> Exec. Order No. 11644, § 8(a).

<sup>86</sup> Exec. Order No. 11644, § 9(a).

- Identify and evaluate information related to the issues listed in Forest Service Handbook 1909.12, § 13.4 (1) & (2); and
- Identify and evaluate information related to the compliance status with Executive Orders 11644 and 11989 and the Travel Management Rule, 36 CFR part 212 subpart B, including: (a) motorized use trends, impacts, and management, including implementation of the 2014 TMP and the degree to which off-road vehicle use on the designated system is minimizing impacts to forest resources and other existing and future recreational uses; and (b) the results of any monitoring of the effects of off-road vehicle use.

Application of the minimization criteria should be informed by the best available scientific information and associated strategies and methodologies for minimizing impacts to particular resources.<sup>87</sup> The Journal of Conservation Planning recently published a literature review and best management practices (BMPs) for ORVs on national forest lands (Switalski and Jones 2012). The BMPs provide guidelines, based on peer-reviewed science, for ORV designation decisions, implementation actions, and monitoring activities that are intended to minimize impacts to soils, water quality, vegetation, and wildlife, and conflicts with other recreational uses. Although they were formulated for national forest lands, most of the BMPs are applicable to OHV designation decisions on BLM lands as well. The information in these BMPs provides useful information for the Planning Team to consider as it develops plan direction regarding the management of OHVs in the Monument.

In addition to the issues listed in the Forest Service’s handbook, we recommend that the agencies also make sure to explicitly discuss the Monument’s recreational niche within the PSINF and RGFO, the broader landscape, and nationally<sup>88</sup>current recreational settings and their sustainability (e.g., have they changed since the current plan was finalized), current management of recreational special use permits for events and outfitting/guiding, identification and management of anthropogenic noise, and existing recreation-related plans, analyses, or studies for the PSINF and RGFO and/or the broader landscape. To that end, we point the Planning Team to the information provided in section II(C)(5) of this letter related to recreation participation and preferences.

## 2. Emphasizing community connections with the Monument

We would like to see the following elements emphasized in the monument plan:

- **Sustainable access:** Sustainable access, facilities and trail maintenance are challenges for public land managers across the country. In many cases, visitors encounter considerable barriers when trying to visit and enjoy public lands. These include lack of outdoor knowledge and language barriers.

---

<sup>87</sup> See *Friends of the Clearwater*, 2015 U.S. Dist. LEXIS 30671, at \*24-30, 40-52 (invalidating route designations that failed to consider best available science on impacts of motorized routes on elk habitat effectiveness or to select routes with the objective of minimizing impacts to that habitat and other forest resources).

<sup>88</sup> See 36 C.F.R. § 219.2(b)(1) (plans must “reflect[] the unit’s expected distinctive roles and contributions to the local area, region, and Nation”); *id.* § 219.7(f)(1)(ii) (“Every plan must . . . [d]escribe the plan area’s distinctive roles and contributions within the broader landscape . . .”).

- Improve trailhead facilities across the monument. Many of the most frequently used areas are in states of disrepair rendering them undesirable and unusable.
  - Develop a built environment in front country settings that maneuvers use away from sensitive resources, enhances public pride and stewardship in the Monument, and enables safe and family friendly recreation in a variety of settings and through a variety of travel modes.
  - Develop and maintain adequate parking facilities
  - Enhance agency presence in frontcountry areas to provide information in multiple languages, make the area feel safe to visitors, and protect resources.
- **Inclusivity:** Many diverse communities encounter barriers to enjoying and visiting public lands. The following recommendation would help overcome these barriers:
    - Develop multilingual signage for the entire monument
    - Ensure that programming and monument materials (brochures) are relevant and engage diverse, local communities (ensure that local, diverse communities can see themselves in the programming and materials)
    - Design the built environment to meet the needs of diverse communities (for example: creating larger family camping and picnicking areas and ensure that the sites have opportunities for all levels of outdoor enthusiasts)
- **Awareness/Engagement:** Many communities are unaware of the outdoor and public land opportunities in their backyards. The new Monument can employ new strategies to engage minority communities in the region. For example:
    - Play regular public service announcements about the monument and its benefits to communities in multiple languages
    - Participate in local and regional community celebrations
    - Continue to partner with and engage community leaders to help promote and connect people to the monument

## E. Ecological Integrity and Wildlife

The Forest Service’s 2012 planning rule supports the National Forest Management Act (NFMA) mandate that forest plans developed under the act must provide for the diversity of habitat and animals found on national forests.<sup>89</sup> There are three overarching substantive requirements in the Forest Service’s planning rule that pertain to providing for diversity. Two of the requirements are that ecosystem plan components maintain or restore 1) ecological integrity and 2) diversity of ecosystems and habitat types.<sup>90</sup> The third is a requirement that the combination of ecosystem and species-specific plan components provide ecological conditions necessary for at-risk species.<sup>91</sup>

The Forest Service planning rule’s approach to conservation planning relies upon the use of surrogate measures – or key characteristics – in assessments, planning and monitoring, to represent the condition

---

<sup>89</sup> Section 6(g)(3)(B) of NFMA stipulates that regulations be written to specify guidelines for land management plans that would: “provide for the diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives...”

<sup>90</sup> 36 C.F.R. § 219.9(a).

<sup>91</sup> 36 C.F.R. § 219.9(b).



of ecosystems, as well as the identification of at-risk species. Forest plans will identify key characteristics of ecosystem structure, function, composition, and connectivity.

The assessment should provide information within the following categories:

Forest Service 2012 Planning Rule Requirement	Information Type
Ecosystem and Habitat Type Diversity (219.9(a)(2))	<ul style="list-style-type: none"> <li>• Key characteristics associated with terrestrial and aquatic ecosystem types</li> <li>• Rare aquatic and terrestrial plant and animal communities</li> <li>• Diversity of native tree species</li> </ul>
Ecosystem Integrity (219.8(a)(1))	Composition Structure Function Connectivity Species diversity Focal species
Species Persistence (219.9(b))	Ecological conditions <sup>92</sup> necessary to: <ol style="list-style-type: none"> <li>1. Contribute to recovery of each threatened and endangered species</li> <li>2. Conserve each proposed and candidate species</li> <li>3. Maintain a viable population of each species of conservation concern within the plan area</li> </ol>

The assessment should consider the results of prior monitoring, and the assessment report should include a summary of what was learned from monitoring under the existing plan (such as Management Indicator Species reports), focusing on the effects of existing plan components.

The Forest Service’s planning rule requires the Forest Service to identify and evaluate fifteen categories of existing information relevant to the plan area.<sup>93</sup> The requirements that relate most directly to diversity include the following subsections:

1. Terrestrial ecosystems, aquatic ecosystems, and watersheds;
3. System drivers, including dominant ecological processes, and stressors, and the ability of ecosystems to adapt to change; and,

<sup>92</sup> Amount, quality, distribution and connectivity of habitat should be included among these conditions. Ecological conditions include human structures (including roads) and uses as well as the biological habitat characteristics that may overlap with characteristics for ecosystem integrity.

<sup>93</sup> 36 C.F.R. § 219.6(b).

5. Threatened, endangered, proposed and candidate species, and potential species of conservation concern.

Though outlined as 15 discrete topics in the Forest Service’s 2012 rule, we recommend that assessments integrate tasks 1, 3, and 5 because these serve as the basis for evaluating the ecological condition of the landscape.

The planning rule’s two-tiered conservation approach (alternatively called the “ecosystem-species” or “coarse-fine” planning method) relies upon the use of surrogate measures, or key characteristics, to represent the condition of ecosystems, as well as the identification of at-risk species and evaluation of whether those species will be sustained through ecosystem-level plan components, or whether they require specific management attention in the form of species-level plan components.

While the Forest Service’s planning rule addresses individual species at the end of the diversity section, it will improve the effectiveness of the coarse filter and the efficiency of the planning process to design the coarse filter with selected species in mind. Consequently, the first factor that should be considered for an assessment is target species for the forest plan. While the most common target species used by the Forest Service are economically valuable tree species, failure to give high priority to important animal and plant species will make it more difficult for plan components to meet requirements in the Forest Service’s planning rule for those species. Specifically, the habitat and other ecological needs of some individual species should be an important consideration in defining ecosystems and selecting their key characteristics.

1. What target species should be considered for selection?

Target species would be selected from among:

1. Federally threatened, endangered, proposed and candidate species
2. SCC identified pursuant to 219.9(b)
3. Focal species selected pursuant to 219.12(a)(5)(iii)
4. Species commonly enjoyed and used by the public selected pursuant to 219.10(a)(5)

- a. *Which federal endangered, threatened, proposed, and candidate species are relevant to the plan area and planning process?*

Federally recognized species (endangered, threatened, proposed, candidate) must be identified through the coordination with Endangered Species Act (ESA) consulting agencies. Starting this process at the assessment stage will provide an opportunity for the consulting agencies to begin contributing information that may be used to design the proposed action. Early contributions to a new or revised plan by the consulting agencies should help streamline the ESA Section 7(a)(2) consultation process for the plan, and increase the likelihood of contributing to recovery of listed species and avoiding listing of proposed and candidate species (see ESA Section 7(a)(1)).<sup>94</sup> These federally recognized species must be

---

<sup>94</sup> The Endangered Species Act: <http://www.fws.gov/endangered/laws-policies/esa.html>.

addressed by plan components if they “may be present” in the plan area<sup>95</sup> and should be included as target species.

Species	Federal Designation under the ESA
Uncompahgre Fritillary Butterfly ( <i>Boloria improba acrocne</i> )	Endangered
Mexican Spotted Owl ( <i>Strix occidentalis lucida</i> )	Threatened
Canada Lynx ( <i>Lynx canadensis</i> )	Threatened
North American wolverine ( <i>Gulo gulo luscus</i> )	Proposed Threatened
Boreal toad ( <i>Anaxyrus boreas boreas</i> )	Under Review
Southern white-tailed ptarmigan ( <i>Lagopus leucura altipetens</i> )	Under Review

Data from: USDOJ Fish and Wildlife Service. Species by County Report for Chaffee County.

b. Which species should be considered for designation as Species of Conservation Concern?

Identification of Species of Conservation Concern (SCC) by the regional forester is a preliminary planning step. It consists of applying regulatory criteria to species in the plan area based on best available scientific information. It is appropriate and necessary for this determination to occur early in the assessment process. Selection of SCC may be revisited throughout the planning process as required by new information.

The regional forester should also include species listed as sensitive by the Forest Service. A sensitive species is a “plant or animal species identified by a regional forester for which population viability is a concern” due to significant current or predicted downward trends in population numbers or density or habitat capability.<sup>96</sup> If a sensitive species is known to occur in a plan area, it should therefore be identified as a species of conservation concern for that area.

For other species known to occur in a plan area, there may be concerns about the risk to persistence in that particular plan area. Planners should cast a wide net to ensure that all potential species at risk are at least considered for attention in the planning process.

NatureServe<sup>97</sup> has designed an independent process that reviews the extinction risk of species throughout their ranges and large regions based on factors addressing rarity, trends and threats. Species are “vulnerable” in this scheme if they are at moderate risk of extinction or elimination due to a restricted range, relatively few populations or occurrences, recent and widespread declines, or other factors. Additionally, the BLM’s Colorado State Office maintains a sensitive species list at the state office, which the Planning Team should consider in the development of the assessment.

To ensure a comprehensive protection of viability for all species in a plan area, plan components should provide necessary ecological conditions for species that are classified under the NatureServe system as critically imperiled, imperiled, or vulnerable globally or nationally (G/N/T 1-3). NatureServe S1 and S2

<sup>95</sup> 50 C.F.R. § 402.12(c)(1), (d).

<sup>96</sup> FSM 2670.5.

<sup>97</sup> See <http://explorer.natureserve.org/ranking.htm>.

(state) rankings must be considered as well, for it stands to reason that a species imperiled at the state level would also suffer from viability concerns on Forest Service lands within that state.

There are many other sources of information about the vulnerability of species in a particular plan area that should also be considered. Existing information for potential SCC from any source (including indigenous knowledge<sup>98</sup> or other anecdotal information) should be provided to the responsible official or the regional forester and reviewed for relevance to this determination.

The regional forester should evaluate any suggested potential species against the criteria in upon request.<sup>99</sup> If the information about a species' abundance, distribution threats, trends or response to management indicates that the species may not continue to persist over the long term in the plan area with a sufficient distribution to be resilient, then the regional forester must select it as an SCC. If not, the regional forester must document the rationale for finding that a potential species does not meet the SCC criteria. FSH 1909.12 section 12.52b (4). Species considered as potential SCC but not meeting the criteria in may be selected as public interest species or focal species.

The analysis of potential SCC must be included in the assessment.<sup>100</sup> The regional forester must also document best science currently available and species information needs, which should be addressed in the monitoring program.<sup>101</sup>

*c. Which species would best serve the Focal Species Role?*

The rule only addresses focal species in conjunction with the plan monitoring program developed by the responsible official.<sup>102</sup> However, the purposes of focal species are to permit "inference to the integrity of the larger ecological system to which it belongs" and provide "meaningful information regarding the effectiveness of the plan in maintaining or restoring the ecological conditions to maintain the diversity of plant and animal communities in the plan area."<sup>103</sup> Therefore focal species should be part of the overall strategy for identifying species at risk and key ecological conditions, and the regional forester should play a role in identifying focal species as well as SCC.

The 2012 rule also includes requirements for focal species. Focal species are employed in the plan monitoring program to evaluate the effectiveness of the forest plan in meeting the diversity requirements.<sup>104</sup> Effective monitoring may require that some SCCs be selected as focal species.

We provide information on just one species (beaver), but this is not at the exclusion of other species that are likely good candidates for serving as a focal species in the plan.

Beaver (*Castor canadensis*)

---

<sup>98</sup> 36 C.F.R. § 219.4(a)(3).

<sup>99</sup> 36 C.F.R. § 219.9(c).

<sup>100</sup> 36 C.F.R. § 219.6(b)(5).

<sup>101</sup> 36 C.F.R. § 219.12(a)(4)(i).

<sup>102</sup> 36 C.F.R. § 219.12(a)(5)(iii).

<sup>103</sup> 36 C.F.R. § 219.19.

<sup>104</sup> 36 C.F.R. § 219.12(a)(5)(iii).

Beavers are considered keystone, or strongly interacting, species. Paine (1969) first described the keystone species idea in the scientific literature. While Paine (1969) did not explicitly define the term, Kotliar et al (1999: 178) provided the following interpretation: “species whose activities greatly influence the composition, integrity, and functioning of communities” that is generally incorporated into and expanded upon in more recent refinements. According to Power et al. (1996), keystone species must bear disproportionately large impacts on their ecological communities. Contemporary scientists are more likely to use the term “strongly interacting” than keystone to differentiate such species. Researchers have documented declines in biodiversity that correlate with declines in strongly interacting species (see Soulé et al. 2005). The concept has evolved into an ecosystem management application and conservation imperative. Soulé et al. (2005: 174) stated,

It is essential, therefore, that conservation practitioners, whether governmental or nongovernmental, adopt an ecological view that ensures the persistence of interactive species at ecologically effective population densities and maximal spatial occurrence (Soulé et al. 2003). In particular, we believe that natural-resource policymakers and wildlands managers should determine whether the rarity or absence (Hughes et al. 2000) of a species in a region can be expected to trigger ecological degradation, including the disappearances of native species and other elements of biodiversity.

A technical conservation assessment of beavers prepared for the Forest Service’s Rocky Mountain Region (Region Two) acknowledged the interactive role of the rodents in riparian systems (Boyle and Owens 2007). Studies have demonstrated the negative consequences of beaver losses as well as the ecosystem services beavers provide through their dam building (Naiman et al. 1994; Gurnell 1998; Wright et al. 2002; Butler and Malanson 2005; Westbrook et al. 2006; Stevens et al. 2007; Bartel et al. 2010; Westbrook et al. 2011). Miller et al. 2003 (188), citing Naiman et al. (1988) and Gurnell (1998), presented a long list of documented ecological impacts of beaver engineering,

stabilization of stream flows; increased wetted surface area (i.e. benthic habitat); elevation of water tables causing changes in floodplain plant communities; creation of forest openings; creation of conditions favoring wildlife that depend upon ponds, pond edges, dead trees, or other new habitats created by beavers; enhancement or degradation of conditions for various species of fish; replacement of lotic invertebrate taxa (e.g., shredders and scrapers) by lentic forms (e.g., collectors and predators); increased invertebrate biomass; increased plankton productivity; reduced stream turbidity; increased nutrient availability; increased carbon turnover time; increased nitrogen fixation by microbes; increased aerobic respiration; increased methane production; reduced spring and summer oxygen levels in beaver ponds; and increased ecosystem resistance to perturbations.

Additionally, the presence of beaver dams and the functional populations of beaver in suitable habitats contribute to resilience in the face of climate change (Bird et al. 2011).

Beaver ponds provide winter habitat for Rio Grande cutthroat trout (Pritchard and Cowley 2006) and breeding habitat for boreal toads (Keinath and McGee 2005), two Region Two sensitive species that occur in the Forest.

*d. Which species that are commonly enjoyed and used by the public should be selected as a target species?*

The Planning Team should consider the following to answer the question which species that are commonly enjoyed and used by the public should be selected as a target species:

- Which game species inhabit the area, and what is their distribution?
- What is the current and projected condition of their habitat in the planning area and larger region?
- What are the local and regional population trends for these species?
- What threats exist that may impact the persistence of these species in the planning area?

We encourage the Planning Team to consult with Colorado Parks and Wildlife (CPW) to answer these questions. Additionally, CPW has GIS spatial data on wildlife distributions for myriad species across the state; this data is available online here:

<http://www.arcgis.com/home/item.html?id=190573c5aba643a0bc058e6f7f0510b7>. We encourage the Planning Team to utilize this data.

2. To what extent are the Forest Service and BLM maintaining and restoring the ecological integrity of terrestrial and aquatic ecosystems and watersheds?<sup>105</sup>

A key step in the assessment process is to identify measurable attributes of ecosystem diversity, ecological integrity, and species persistence. An attribute refers to a measurable characteristic that serves as an indicator, such as overstory canopy closure, number of large dead trees, the degree of habitat fragmentation within an ecosystem or the distribution of a species. These same attributes would then be considered for development of plan components and the monitoring program.

The Forest Service's planning rule requires that plan components provide the ecological conditions to maintain the diversity of plant and animal communities and support the persistence of native species in the plan area.<sup>106</sup> The assessment must identify the ecological conditions that will be most relevant and useful for developing plan components for diversity.

The Forest Service's planning rule adopts "a complementary ecosystem and species-specific approach to maintaining the diversity of plant and animal communities and the persistence of native species in the plan area."<sup>107</sup> The ecosystem or "coarse filter" approach requires plan components to maintain or restore the integrity of those ecosystems and watersheds in the forest plan area. The coarse filter approach is based on the assumption that ecological conditions similar to those under which native species have evolved would usually maintain the vast majority of species in an area.<sup>108</sup> Therefore,

---

<sup>105</sup> As outlined in 219.8(a)(1).

<sup>106</sup> 36 C.F.R. § 219.9. Additionally, ecological conditions include "habitat and other influences on species and the environment," including structural developments and human uses. 219.19.

<sup>107</sup> 36 C.F.R. § 219.9.

<sup>108</sup> 77 Fed. Reg. at 21212 (April 9, 2012).

ecological integrity occurs when key ecosystem characteristics occur within the natural range of variation (NRV).<sup>109</sup>

*a. What was the historic or natural condition of ecosystems and habitat types?*

An ecosystem is considered to have integrity when its key attributes occur within the NRV. NRV can be thought of as a reference condition reflecting “natural” conditions. Those conditions can be estimated using information from historical reference ecosystems, or by other science-based methods. For example, some current ecosystems have deficits of old-growth trees, compared to historical abundances. The 2012 Forest Service planning rule requires the Forest Service to identify the key characteristics of ecosystems and manage them in light of these reference conditions, for the purpose of sustaining ecosystems and wildlife. The Forest Service directives suggest adapting NRV analyses from comparable Forest System units.<sup>110</sup> In this case, it may be appropriate to borrow from the BLM Tres Rios Field Office – San Juan National Forest Land and Resource Management Plan, which was developed in 2013. Several additional sources include NRV information or reference conditions for the southern Rockies region.

- The Nature Conservancy’s Southern Rocky Mountains: An Ecoregional Assessment and Conservation Blueprint (Neely et al. 2001), provides NRV information for compositional attributes. This assessment includes an extensive list of floral and faunal species within the ecoregion, including imperiled and focal species, and an evaluation of habitat threats.
- The Southern Rockies Wildlands Network Vision (Miller et al. 2003) is a source for reference condition information and includes information about connectivity attributes.

*b. What are the relevant drivers and stressors?*

The Forest Service’s planning rule requires that plan components provide the ecological conditions necessary for at-risk species. These ecological conditions necessary for at-risk species are more encompassing than the “dominant ecological conditions” used to evaluate integrity, which are limited to biological characteristics. “Ecological conditions” are more broadly defined to include all elements of the biological and physical environment that can affect the diversity of plant and animal communities. They include human structures and uses as well as biological characteristics. See definition of “ecological conditions” at 36 CFR 219.19.

Looking solely at NRV for dominant biological characteristics ignores how other human factors can affect diversity. Roads and other human uses and structures may affect connectivity by reducing the ability of wildlife to reach habitat having the desired biological characteristics, and may reduce the security that would allow them to fully utilize those characteristics if they do reach the habitat. The assessment should identify stressors related to these conditions, including stressors from outside of the plan area that may affect a species.

---

<sup>109</sup> 36 C.F.R. § 219.19.

<sup>110</sup> “The Interdisciplinary Team may adapt the natural range of variation analysis from another National Forest System unit for specific ecosystems that are shared and make adjustments to fit the local conditions” FSH1909.12, Ch. 10, § 12.14(a).

The Forest Service’s planning rule requires the assessment to identify and evaluate information regarding “the ability of terrestrial and aquatic ecosystems on the plan area to adapt to change.”<sup>111</sup> The assessment must therefore consider possible future scenarios for so called “system drivers” – including climate change – and identify those most likely to occur based on the best available scientific information. That information would be incorporated into projections for ecosystem and species sustainability, so that the monument plan and plan components can address the vulnerability and sustainability of ecosystems and species under probable climate change scenarios.

*c. What are the current condition of ecosystems and habitat types?*

The species composition and diversity aspects of ecological integrity should be addressed by identifying key ecological conditions for the species at risk identified above. The relationship between these key ecological conditions and changes in species populations should be documented so that it can be tested as a “relevant assumption” under the monitoring program.<sup>112</sup>

During the process of determining that a species is at risk in the plan area, the regional forester should compile information about the ecological conditions necessary for each species,<sup>113</sup> including ecosystem composition, structure, function and connectivity. These should include the most important habitat elements for a species, and should represent limiting factors or those being threatened by actions that may be influenced by plan components. The assessment should address species population distributions as key ecological conditions for species diversity.

It is necessary to consider human structures and uses in the assessment because they are included in the definition of ecological conditions. Identification of these ecological conditions is needed during the assessment to provide a basis for plan components that would manage human structures and uses. In most cases, it is likely that roads and their use (as noted above) will be the predominant direct human influence on ecological conditions and diversity in the plan area, so these would be good candidates for necessary ecological conditions.

Assessments of current ecosystem and habitat conditions in the region include Neely et al. (2000) and Miller et al. (2003).

**F. Climate Change**

1. Baseline assessment

Baseline data on climate change must be sufficient to permit analysis of impacts under NEPA. This baseline condition should be documented in the planning assessment. Ecosystem impacts from climate change include shrinking water resources; extreme flooding events; invasion of more combustible non-native plant species; soil erosion; loss of wildlife habitat; and larger, hotter wildfires. Many of these impacts have been catalogued in recent studies by federal agencies showing the impacts of climate change specifically in the United States such as the National Climate Assessment (2014). We encourage

---

<sup>111</sup> 36 C.F.R. § 219.6(b)(3).

<sup>112</sup> 36 C.F.R. § 219.12(a)(2).

<sup>113</sup> 36 C.F.R. § 219.9(b).



the Planning Team to use this report and other scientific information to document, to the best of your ability, the current and projected impacts from climate change on Monument resources.

## 2. Recommended Approach to Managing Climate Change in the Monument Plan

Under the pressures of global change, it must be acknowledged that many objects of conservation are at risk wherever they are found, and the traditional natural resource management paradigm of modifying ecosystems to increase yield must change to a new paradigm of managing wildland ecosystems to minimize loss – specifically loss of the ecosystem composition, structure, and function that yields the benefits we seek from wildlands. Natural resource management must change from a paradigm of maximum sustained yield to a paradigm of risk management.

Although there is no widely-accepted method of assessing and managing risk, we recommend breaking risk down into its component parts—vulnerability, exposure, and uncertainty—as a useful way to think about risk to biodiversity and productive potential. In the TWS report, “Recommended Risk Assessment and Management Approach for Addressing Climate Change in BLM Land Use Planning” (Appendix 5), we recommend an approach for assessing risk in the planning area as well as an approach for management of that risk for the Forest Service and BLM to comply with its legal obligations under NEPA, the Forest Service’s 2012 planning rule, and FLPMA as set out above.

## 3. Adapting to Climate Change

The biggest question that land managers face today is how we respond to uncertainty in the face of global climate change. It is especially challenging for planners to make predictions about future ecosystem dynamics 10, 20 or 50 years down the line. Adaptation to changing conditions is and will be essential. However, general statements that BLM/Forest Service will plan to “be adaptive” is not planning—it is a strategy that is reactive only. A true plan for climate adaptation will require applying knowledge and foresight gained from a “learn as you go” approach.

We recommend using an experimental, adaptive design known as the “portfolio approach” of management strategies (Aplet and McKinley 2017). As stated by Aplet et al., “high uncertainty regarding future climate, ecological conditions, and management consequences makes it impossible to know what strategy to apply, where to apply it, or for what duration to sustain ecosystem diversity and productivity.” Thus, Aplet and McKinley conclude that land managers should use an experimental zoning approach for managing certain lands that include the following zones as management strategies:

- **Restoration Zones:** areas that are devoted to forestalling change through the process of ecological restoration;
- **Innovation Zones:** areas that are devoted to innovative management that anticipates climate change and guides ecological change to prepare for it; and
- **Observation Zones:** areas that are left to change on their own time to serve as scientific “controls” and to hedge against the unintended consequences of active management elsewhere.

These strategies should be used in conjunction with each other to spread the risk among the different strategies and to allow for diverse outcomes to inform rapid learning about management strategies in the future. This is the kind of deliberate yet dynamic planning process that Forest Service and BLM should be fostering in management plans.

The Forest Service and BLM are equipped to apply this type of portfolio approach due both agencies' wide variety of designations and management regimes. The purpose of **restoration zones** is to sustain existing or historical ecosystems. This type of strategy lends itself to designations such as conservation areas, ACECs and other lands that are set aside for conservation of natural and cultural resources, but that may also be appropriate for restoration in certain areas.

Due to the acknowledgement that returning to historical range of variability is an increasingly challenging concept in the study of climate change, **innovation zones** are also necessary. This is where the forecasting of climate change may drive greater intervention to experiment with things like anticipatorily boosting resiliency or facilitating transition to an altered future state where shifts seem inevitable. This strategy would be more appropriate for federal lands that have already sustained substantial change or where future impacts of climate change may severely disrupt the production of ecosystem goods and services. Conservation designations or allocations would typically not fall within this management strategy.

The third strategy of establishing **observation zones** is necessary to allow for ecosystems to generally change without specific intervention, as a scientific control. This management strategy would be most appropriate for Wilderness, WSAs, Recommended Wilderness, Research Natural Areas, and lands managed for wilderness characteristics, but would also be the default strategy for lands that could not be managed for treatment under the restoration and innovation zones due to budget and operational constraints or in lands between such designations where connectivity is desirable to facilitate movement in response to climate change.

These zones are meant to be delineated at large landscape scales. The Monument planning area is too small to set out three different zones. We encourage the Forest Service and BLM to consider this planning approach at the forest and Field Office level and in which zone the Monument would fall. For obvious reasons, we recommend that the Monument fall in the observation zone. To learn more about this three-zone approach, please review the Aplet McKinley paper which we provide to the Planning Team.

#### **G. Areas of Tribal Importance & Cultural and Historic Resources and Use**

The Monument Proclamation notes that there are eighteen archeological sites within the Browns Canyon area. We highlight studies here that will inform the development of plan direction regarding how these sites should be managed to ensure they are not damaged.

Recent literature has found a positive correlation between motorized access and damage to archeological resources.

- A recent study on the Tonto National Forest in Arizona found that 87 percent of archeological sites inventoried were damaged, with damage occurring significantly more often near roads (Hedquist et al., 2014).
- 46 percent of known cultural resources were damaged in close proximity to OHV routes in a California state park in the Mojave Desert (Sampson 2009).
- In Range Creek Canyon in Utah, the report authors found that sites with controlled vehicle access were mostly preserved, while sites outside were more vulnerable to vandalism and degradation (Spangler et al. 2006).
- Spangler and Yentsch (2008) found that motorized use was causing significant damage to archaeological and cultural resources.
- Routes in the Sonoran Desert National Monuments have “direct impacts to archaeological sites that have roads cutting through them and have indirect impacts to sites near routes by allowing access to archaeological resources” (Bungart et al. 2009).

Although travel management for the most part is decided in conforming project-level plans and decisions, land management plans should include the framework for managing motorized use in the form of plan components (e.g., desired conditions, standards and guidelines). To this end, we encourage the Monument Planning Team to consider the above referenced studies to inform the development of plan components that will ensure archeological and cultural resources are properly managed and protected over the life of the plan.

### **III. Conclusion**

Thank you for your consideration of the information in this letter. Although not comprehensive, we believe the information represents the best available scientific information that the agencies must include in the assessment. We look forward to discussing this information further, and working with you throughout the planning process to ensure the Monument plan reflects that area’s distinctive wilderness heritage and role and contribution as a hotbed for recreation, habitat, and cultural resources.

Please contact Josh Hicks at [josh\\_hicks@twc.org](mailto:josh_hicks@twc.org) or 303-650-1148 or Phil Hanceford at [phil\\_hanceford@twc.org](mailto:phil_hanceford@twc.org) or 303-225-4636 at The Wilderness Society with any questions.

### List of Appendices

- Appendix 1: Ecosystem Representation Analysis for Browns Canyon National Monument
- Appendix 2: Wild Connections Wilderness Inventory Report for Browns Canyon South LWC
- Appendix 3: Survey conducted by Talmey-Drake Research & Strategy, Inc., a public opinion and market research firm in Boulder, Colorado
- Appendix 4: Annotated Bibliography on Economic Benefits of Protected Public Lands
- Appendix 5: Recommended Risk Assessment and Management Approach for Addressing Climate Change in BLM Land Use Planning

### Literature Cited

Anderson, H.M., C. Gaolach, J. Thomson, and G. Aplet. 2012. Watershed Health in Wilderness, Roadless, and Roaded Areas of the National Forest System. Wilderness Society Report. Available at <http://wilderness.org/resource/watershed-health-wilderness-roadless-and-roaded-areas-national-forest-system>.

Arcese P. and A.R.E. Sinclair. 1997. The Role of Protected Areas as Ecological Baselines. The Journal of Wildlife Management, 61(3): 587-602. Available at [http://www.jstor.org/stable/3802167?seq=8&uid=3739584&uid=2&uid=4&uid=3739256&sid=21106003242731#page\\_scan\\_tab\\_contents](http://www.jstor.org/stable/3802167?seq=8&uid=3739584&uid=2&uid=4&uid=3739256&sid=21106003242731#page_scan_tab_contents).

Bartel, R.A., N.M. Haddad, and J.P. Wright. 2010. Ecosystem engineers maintain a rare species of butterfly and increase plant diversity. *Oikos*. 119: 883-890.

Belote, R.T., M. Dietz, and G. Aplet. 2015. Allocating untreated “controls” in the National Wilderness Preservation System as a climate adaptation strategy: a case study from the Flathead National Forest, Montana. *Northwest Science*, 89(3). Pages. 239-254. Available at <http://www.bioone.org/doi/full/10.3955/046.089.0311>.

Bertzky, B., Corrigan, C., Kemsey, J., et al. 2012. Protected planet report 2012: tracking progress towards global targets for protected areas. IUCN, Gland, Switzerland and UNEP WCMC, Cambridge, UK.

Bird, B., M. O'Brien, M. Petersen. 2011. Beaver and Climate Change Adaptation in North America: A Simple, Cost-Effective Strategy. *WildEarth Guardians*. September.

Bowker, J.M., et al. 2006. Wilderness and Primitive Area Recreation Participation and Consumption: An Examination of Demographic and Spatial Factors. *Journal of Agricultural and Applied Economics*, 38(2): 317-326. Available at <http://ageconsearch.umn.edu/bitstream/43765/2/317.pdf>.

Boyle, S. and S. Owens. North American Beaver (*Castor canadensis*): a technical conservation assessment. USDA Forest Service, Rocky Mountain Region. February 6, 2007. Available at <http://www.fs.fed.us/r2/projects/scp/assessments/northamericanbeaver.pdf>.

Bureau of Land Management (BLM). Recreation Strategy 2014-2019: Connecting with Communities. 2014. Available at [https://www.blm.gov/sites/blm.gov/files/program\\_recreation\\_homepage\\_ConnectingWithCommunities\\_strategy\\_0.pdf](https://www.blm.gov/sites/blm.gov/files/program_recreation_homepage_ConnectingWithCommunities_strategy_0.pdf).

Butler, D.R. and G.P. Malanson. 1995. Sedimentation rates and patterns in beaver ponds in a mountain environment. *Geomorphology*. 13: 255-269.

Colorado College. 2012. "Conservation in the West Poll: Colorado Report." The Colorado College State of the Rockies Project. January 2012. Available at <https://www.coloradocollege.edu/dotAsset/e4af72f6-baad-4b91-bb38-cbdba52aaa07.pdf>.

Colorado Parks and Wildlife, Research, Policy and Planning Unit. 2014. 2013 Outdoor Recreation Participation Public Survey Summary Report. Available at <http://cpw.state.co.us/Documents/Trails/SCORP/2013PublicSurveySummaryReport.pdf>.

Cordell, K.H., 2004. Outdoor Recreation for 21<sup>st</sup> Century America, A Report to the Nation: The National Survey on Recreation and the Environment. Venture Publishing, Inc., State College, PA.

Cordell, H.K., J.C. Bergstrom, and J.M. Bowker. 2005. The Multiple Values of Wilderness. Venture Publishing, Inc., State College, PA.

Cordell, H.K., C.J. Beltz, and G.T. Green. 2008a. Nature-based Outdoor Recreation Trends and Wilderness. *International Journal of Wilderness*, 14(2): 7-9, 13. Available at [http://www.srs.fs.fed.us/pubs/ja/ja\\_cordell022.pdf](http://www.srs.fs.fed.us/pubs/ja/ja_cordell022.pdf).

Cordell, K.H., C.J. Betz, M.J. Fly, S. Mou, and G.T. Green. 2008b. How Do Americans View Wilderness: A Wilderness Research Report in the IRIS Series. Available at <http://warnell.forestry.uga.edu/nrrt/nsre/IRISWild/IrisWild1rptR.pdf>.

Cordell, K.H., T.L. Eubanks, C.J. Betz, G.T. Green, B. Stephens, and S. Mou. 2008c. American Birders – Their Numbers and Outdoor Activity Profiles. A Recreation Research Report in the IRIS Series. Available at <http://warnell.forestry.uga.edu/nrrt/nsre/IRISRec/IrisRec2rpt.pdf>.

Crist, M.R., B.O. Wilmer, and G.H. Aplet. 2005. Assessing the value of roadless areas in a conservation reserve strategy: biodiversity and landscape connectivity in the northern Rockies. *Journal of Applied Ecology*, 42: 181-191.

DellaSala, D., J. Karr, and D. Olson. 2011. Roadless areas and clean water. *Journal of Soil and Water Conservation*, 66(3): 78A-84A. Available at <http://www.jswconline.org/content/66/3/78A.full.pdf+html>.

DeVelice, R. and J.R. Martin. 2001. Assessing the extent to which roadless areas complement the conservation of biological diversity. *Ecological Applications* 11(4): 1008-1018. Available at [http://www.jstor.org/stable/3061008?seq=1&uid=3739584&uid=2&uid=4&uid=3739256&sid=21106003975961#page\\_scan\\_tab\\_contents](http://www.jstor.org/stable/3061008?seq=1&uid=3739584&uid=2&uid=4&uid=3739256&sid=21106003975961#page_scan_tab_contents).

Dickson, B.G., Zachmann L.J., Albano, C.M. 2014. Systematic identification of potential conservation priority areas on roadless Bureau of Land Management lands in the western United States. *Biological Conservation*. 178: 117-127

Dietz, M.S., R.T. Belote, G.H. Aplet, & J.L. Aycrigg. 2015. The world's largest wilderness protection network after 50 years: An assessment of ecosystem representation in the U.S. National Wilderness Preservation System. *Biological Conservation*, 184: 431-438. Available at <http://www.sciencedirect.com/science/article/pii/S0006320715000944>.

Duffy-Deno, K. 1998. The Effect of Federal Wilderness on County Growth in the Intermountain Western United States. *Journal of Regional Science*, 38(1): 109-136. Available at <http://onlinelibrary.wiley.com.ezproxy.princeton.edu/doi/10.1111/0022-4146.00084/epdf>.

Gurnell, A.M. 1998. The hydrogeomorphological effects of beaver dam-building activity. *Progress in Physical Geography* 22(2): 167-189.

Headwaters Economics. 2012. West Is Best: Protected Lands Promote Colorado Jobs and Higher Incomes. Available at <http://headwaterseconomics.org/land/west-is-best-value-of-public-lands-co>.

Hedquist, S. L., Ellison, L. A., & Laurenzi, A. (2014). Public lands and cultural resource protection. *Advances in Archaeological Practice*, 2, 298-310.

Keinath, D. and M. McGee. 2005. Boreal Toad (*Bufo boreas boreas*): A Technical Conservation Assessment. Prepared for USDA Forest Service, Rocky Mountain Region. May 25.

Kittel, G., E. VanWie, M. Damm, R. Rondeau, S. Kettler, and J. Sanderson. 1999. A Classification of Riparian Plant Associations of the Rio Grande and Closed Basin Watersheds, Colorado.

Kotliar C.B., B.W. Baker, A.D. Whicker, G. Plumb. 1999. A critical review of assumptions about the prairie dog as a keystone species. *Environmental Management*. 24: 177-192.

Lewis, D.J., G.L. Hunt, and A.J. Plantinga. 2002. Public Land Conservation and Employment Growth in the Northern Forest Region. *Land Economics* 78(2): 245-259. Available at <http://appliedecon.oregonstate.edu/sites/default/files/faculty/plantinga/migraton/LewisHuntPlantinga2002LE.pdf>.

Lorah, P. and R. Southwick. 2003. Environmental protection, population change, and economic development in the rural western United States. *Population and Environment* 24(3): 255–272. Available at <http://www.southwickassociates.com/wp-content/uploads/2011/10/Env-prot-pop-change-in-western-us-RLPAreas.pdf>.

Loucks, C., N. Brown, A. Loucks, and K. Cesareo. 2003. USDA Forest Service Roadless areas: Potential Biodiversity Conservation Reserves. *Conservation Ecology* 7(2): 5. Available at <http://www.ecologyandsociety.org/vol7/iss2/art5/>.

Margules, C.R. and R.L. Pressey. 2000. Systematic conservation planning. *Nature*, 405: 243-253. Available at <http://www.nature.com/nature/journal/v405/n6783/full/405243a0.html>.

Mawdsley, J., R. O'Malley, and D.S. Ojima. 2009. A Review of Climate-Change Adaptation Strategies for Wildlife Management and Biodiversity Conservation. *Conservation Biology*, 23(5): 1080-1089. Available at <http://onlinelibrary.wiley.com/doi/10.1111/j.1523-1739.2009.01264.x/abstract>.

Miller, B., D. Foreman, M. Fink, D. Shinneman, J. Smith, M. DeMarco, M. Soule, R. Howard. 2003. Southern Rockies Wildlands Network Vision. Southern Rockies Ecosystem Project. July.

Naiman R.J., C.A. Johnston, J.C. Kelley. 1988. Alteration of North American streams by beaver. *BioScience* 38: 753-762.

National Climate Assessment: Global Climate Change Impacts in the United States. 2014.

Neely, B., P. Comer, C. Moritz, M. Lammert, R. Rondeau, C. Pague, G. Bell, H. Copeland, J. Humke, S. Spackman, T. Schulz, D. Theobald, and L. Valutis. 2001. Southern Rocky Mountains: An Ecoregional Assessment and Conservation Blueprint. Prepared by The Nature Conservancy with support from the U.S. Forest Service, Rocky Mountain Region, Colorado Division of Wildlife, and Bureau of Land Management.

Olson, D.M. and E. Dinerstein. 1998. The global 200: A representation approach to conserving the Earth's most biologically valuable ecoregions. *Conservation Biology*, 12: 502-515. Available at [http://www.jstor.org.ezproxy.princeton.edu/stable/2387232?seq=1#page\\_scan\\_tab\\_contents](http://www.jstor.org.ezproxy.princeton.edu/stable/2387232?seq=1#page_scan_tab_contents).

Outdoor Foundation. 2013. Special Report on Paddlesports. Available at <http://www.outdoorfoundation.org/research.paddlesports.2013.html>.

Paine R.T. 1969. A note on trophic complexity and community stability. *American Naturalist*. 1103: 91-93.

Phillips, S. 2004. Windfalls for Wilderness: Land Protection and Land Value in the Green Mountains. Ph.D. Dissertation. Virginia Polytechnic Institute and State University, Blacksburg, VA. Available at [http://www.wilderness.net/library/documents/Phillips\\_2-33.pdf](http://www.wilderness.net/library/documents/Phillips_2-33.pdf).

Power, M.E., D. Tilman, J.A. Estes, B.A. Menge, W.J. Bond, L.S. Mills, G. Daily, J.C. Castilla, J. Lubchenco, R.T. Paine. 1996. Challenges in the quest for keystones. *BioScience*. 46: 609-620.

Pritchard, V.L., D.E. Cowley. 2006. Rio Grande Cutthroat Trout (*Oncorhynchus clarkii virginalis*): A Technical Conservation Assessment. Prepared for the USDA Forest Service, Rocky Mountain Region, Species Conservation Project. July 28.

Rasker, R., B. Alexander, J. van den Noort, and R. Carter. 2004. Prosperity in the 21<sup>st</sup> Century West – the Role of Protected Public Lands. Sonoran Institute.

Rasker, R. 2006. An exploration into the economic impact of industrial development versus conservation on western public lands. *Society & Natural Resources*, 19(3): 191–207. Available at <http://www.tandfonline.com/doi/abs/10.1080/08941920500460583?journalCode=usnr20#.VUjLrPIVhBc>

Rasker, R., P.H. Gude, J.A. Gude, and J. van den Noort. 2009. The Economic Importance of Air Travel in High-Amenity Rural Areas. *Journal of Rural Studies*, 25: 343-353. Available at [http://headwaterseconomics.org/3wests/Rasker\\_et\\_al\\_2009\\_Three\\_Wests.pdf](http://headwaterseconomics.org/3wests/Rasker_et_al_2009_Three_Wests.pdf).

Sampson, M. P. (2009). The effects of off-highway vehicles on the cultural resources of Red Rock Canyon State Park, California. *Proceedings of the Society for California Archaeology* 21, 190-201. Available at [https://www.parks.ca.gov/?page\\_id=24576](https://www.parks.ca.gov/?page_id=24576).

Soule, M.E., J.A. Estes, B. Miller, D.L. Honnold. 2005. Strongly interacting species: conservation policy, management, and ethics. *BioScience*. 55(2): 168-176.

Southwick Associates. 2012. The Outdoor Recreation Economy: Technical Report on Methods and Findings. A study prepared for the Outdoor Industry Association.

Spangler, Jerry D, Shannon Arnold and Joel Boomgarden. 2006. Chasing Ghosts: An Analysis of Vandalism and Site Degradation in Range Creek Canyon, Utah. Utah Museum of Natural History Occasional Papers 2006:1. Salt Lake City.

Spangler, J. D., & Yentsch, A. 2008. *Final Report: Baseline Site Condition and Vandalism Assessments of Archaeological Sites in Tenmile Canyon, Grand County*. Ogden, Utah: Colorado Plateau Archaeological Alliance.

Stevens, C.E., C.A. Paszkowski, and A.L. Foote. 2007. Beaver (*Castor canadensis*) as a surrogate species for conserving anuran amphibians on boreal streams in Alberta, Canada. *Biological Conservation*. 134: 1-13.

Strittholt, J. and D. DellaSala. 2001. Importance of Roadless Area Conservation in Forested Ecosystems: Case Study of the Klamath-Siskiyou Region of the United States. In *Conservation Biology* 15(6): 1742-1754. Available at [http://www.researchgate.net/publication/255439281\\_Importance\\_of\\_Roadless\\_Areas\\_in\\_Biodiversity\\_Conservation\\_in\\_Forested\\_Ecosystems\\_Case\\_Study\\_of\\_the\\_Klamath-Siskiyou\\_Ecoregion\\_of\\_the\\_United\\_States](http://www.researchgate.net/publication/255439281_Importance_of_Roadless_Areas_in_Biodiversity_Conservation_in_Forested_Ecosystems_Case_Study_of_the_Klamath-Siskiyou_Ecoregion_of_the_United_States).

Switalski, T. A. and Jones, A. 2012. Off-road vehicle best management practices for forestlands: A review of scientific literature and guidance for managers, 8 *Journal of Conservation Planning* 12-24. Available at [http://www.journalconsplanning.org/2012/JCP\\_v8\\_2\\_Switalski.pdf](http://www.journalconsplanning.org/2012/JCP_v8_2_Switalski.pdf). Development of a BLM-specific literature review and set of BMPs is in progress.

The Wilderness Society. 2004. Landscape Connectivity: An Essential Element of Land Management. Policy Brief. Number 1.



USDA Forest Service. 2001. Final National Forest System Road Management Strategy Environmental Assessment and Civil Rights Impact Analysis. Available at [http://www.fs.fed.us/eng/road\\_mgt/Final-Forest-Service-EA/HTML/FINAL%20EA.htm](http://www.fs.fed.us/eng/road_mgt/Final-Forest-Service-EA/HTML/FINAL%20EA.htm).

USDA Forest Service. 2005. Socio-Economic Assessment for the Apache-Sitgreaves National Forest. Available at [http://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/fsbdev3\\_021473.pdf](http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsbdev3_021473.pdf).

USDA Forest Service. 2010. Connecting People with America's Great Outdoors: A Framework for Sustainable Recreation. Available at [http://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprdb5346549.pdf](http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5346549.pdf).

USDA Forest Service. 2011. National Visitor Use Monitoring Results for FY 2011 for the Pike San Isabel National Forest. Available online at [http://apps.fs.fed.us/nfs/nrm/nvum/results/ReportCache/Rnd3\\_A02012\\_Master\\_Report.pdf](http://apps.fs.fed.us/nfs/nrm/nvum/results/ReportCache/Rnd3_A02012_Master_Report.pdf).

USDOI Fish and Wildlife Service. 2011a. National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. Available at <https://www.census.gov/prod/2012pubs/fhw11-nat.pdf>.

USDOI Fish and Wildlife Service 2011b. National Survey of Hunting, Fishing and Wildlife-associated Recreation - Colorado. Available at <http://www.census.gov/prod/2013pubs/fhw11-co.pdf>

USDOI National Park Service. 2001. Economic Benefits of Conserved Rivers: An Annotated Bibliography. Rivers, Trails & Conservation Assistance Program.

Westbrook, C.J., D.J. Cooper, and B.W. Baker. 2006. Beaver dams and overbank floods influence groundwater---surface water interactions of a Rocky Mountain riparian area. *Water Resources Research*. 42.

Westbrook, C.J., Cooper, D.J. and Baker, B.W. 2011. Beaver assisted river valley formation. *River Research and Applications*. 27: 247-256.

Wilcove, D.S. 1990. The role of wilderness in protecting biodiversity. *Natural Resources and Environmental Issues*: Vol. 0, Article 7. Available at <http://digitalcommons.usu.edu/nrei/vol0/iss1/7/>.

Wright, J.P., C.G. Jones, and A.S. Flecker. 2002. An ecosystem engineer, the beaver, increases species richness at the landscape scale. *Oecologia*. 132: 96-101.

1 **APPENDIX D – USFS AND BLM CORRELATION OF TERMS AND**  
 2 **PROCESSES**

3 The BCNM MP-EIS will be a multijurisdictional plan, that is, a collaborative planning effort in which the purpose is to address land  
 4 use planning issues for a landscape unit in which there is adjoining and overlapping Federal and state agency authorities. Different  
 5 terminology in use and planning processes between the USFS and the BLM may result in confusion on the part of plan participants  
 6 and the public. Table 1 compares similar agency concepts with common definitions. Bold items indicate the planning team’s preferred  
 7 term for the joint BCNM MP-EIS. Figure 1 highlights the BLM’s RMP process and Figure 2 highlights the USFS’s NEPA planning  
 8 process. Differences are noted.

9 **Table 1 Agency Correlation of Terms**

<b>USFS</b>	<b>BLM</b>	<b>Definition</b>
Designated Area; Botanical Area, Geological Area, Historical Area, Paleontological Area, Scenic Area, Zoological Area, Research Natural Area, Significant Caves. Statutorily Designated Areas, Administratively Designated Areas, Regional Forester Administratively Designated Areas	Area of Critical Environmental Concern (ACEC)	An area or feature identified and managed to maintain its unique special character or purpose. Some USFS categories of designated areas may be may be established administratively in the land management planning process. Examples of administratively designated areas are ACECs, experimental forests, research natural areas, scenic byways, botanical areas, and significant caves.
Scenery Management System	Visual Resource Management	Agency system to manage visual and scenic resources. Objective which prescribes the amount of change allowed in the characteristic landscape are established in the Land Use Plan. See Visual Resources section of Planning Assessment for crosswalk of USFS-BLM terminology.
Species of conservation concern	Sensitive species	Identifying the sensitive species usually occurs during the planning phase, but may occur at any time.
<b>Planning Assessment (PA)</b>	Analysis of the	An early summary document that describes the best available scientific information, the

**APPENDIX D – USFS AND BLM CORRELATION OF TERMS AND PROCESSES**

USFS	BLM	Definition
	Management Situation (AMS)	physical and biological characteristics and condition of resources within the planning area, provides a snapshot of how those resources are currently being managed, and identifies observable and measurable trends in resources and resource uses between past and present as well future management opportunities and a need for change.
Recreational Area	<b>Special Recreation Management Area (SRMA)</b> or extensive recreation management area (ERMA)	Public lands unit identified in land use plans for specific recreational outcomes and settings are administratively designated as SRMAs. Recreation management actions within an ERMA are limited to only those of a custodial nature.
<b>Need for change</b> (in the PA)	Potential new decisions for the RMP revision (in the AMS)	Identifies the need for changing existing management direction that will better reach desired conditions. Potential new decisions are evaluated in RMP alternatives. Early in the planning phase, a “preliminary need to change the plan” is identified and public comment is sought to help develop the need to change the plan, which in turn helps focus plan development or revision.
<b>Proposed Action</b>	<b>Proposed Action</b>	Under the 2012 USFS Planning Rule, a Proposed Action is identified at scoping. Scoping input then helps refine the Proposed Action. Under the BLM Land Use Planning Handbook, a Proposed Action is not identified until the Draft NEPA document.
<b>Best Available Scientific Information (BASI)</b>	High Quality Information (HQI)	Under the 2012 USFS Planning Rule, the best available scientific information (BASI) must inform the planning process. The rule requires that the responsible official document how BASI was determined to be accurate, reliable, and relevant to the issues being considered. (FSH 1909.12 - Land Management Planning Handbook; Chapter 40 – Key Processes Supporting Land Management Planning) The BLM Planning 2.0 process anticipated utilizing High Quality Information in planning. However, as Planning 2.0 has been discontinued the MP-EIS will rely on BASI.
Botanical Area, Geological Area Paleontological Area, Scenic Area, Zoological Area, Research Natural Area, Significant Caves	Areas of relative ecological importance	Areas to be considered in the land use planning range of alternatives based upon information such as dominant patterns across the ecoregion, habitat extent, habitat condition, species connectivity requirements, and overall plant and animal species diversity.
No USFS Equivalent.	Implementation plan	An area or site-specific plan written to implement decisions made in a land use plan.

**APPENDIX D – USFS AND BLM CORRELATION OF TERMS AND PROCESSES**

USFS	BLM	Definition
		Implementation plans include both activity plans and project plans (they are types of implementation plans). The AHRA Management Plan is an example of an implementation plan.
Influence of the Plan Area on Social, Cultural and Economic Conditions	Beneficial outcomes	Also referenced as “Recreation Benefits”; improved conditions, maintenance of desired conditions, prevention of worse conditions, and the realization of desired experiences.
Goals and Objectives (Subset of Planning Components)	Desired outcomes	A type of land use plan decision expressed as a goal or objective.
Suitability of Lands	Allowable uses	Land use plans must identify uses, or allocations, that are allowable, restricted, or prohibited on the public lands and mineral estate. These allocations identify surface lands and/or subsurface mineral interests where uses are allowed, including any restrictions that may be needed to meet goals and objectives. Land use plans also identify lands where specific uses are excluded to protect resource values.
Plan Components	Management actions	Land use plans must identify the actions anticipated to achieve desired outcomes, including actions to maintain, restore, or improve land health. These actions include proactive measures (e.g., measures that will be taken to enhance watershed function and condition), as well as measures or criteria that will be applied to guide day-to-day activities occurring on public land.
Suitability of Lands	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 planning area, based on desired future conditions.
Not a USFS equivalent through several considerations are listed in FSH 1909.12 Chapter 10	<b>Planning criteria</b>	The standards, rules, and other factors developed by managers and interdisciplinary teams for their use in forming judgments about decision making, analysis, and data collection during planning. Planning criteria streamline and simplify the resource management planning actions
Sustainable Recreation, Recreation Opportunity, <b>Recreation Settings</b>	Recreation Management Zones (RMZ)	Subunits within a special recreation management area managed for distinctly different recreation products. Recreation products are comprised of recreation opportunities, the natural resource and community settings within which they occur, and the administrative and service environment created by all affecting recreation-tourism providers, within which recreation participation occurs.  An opportunity to participate in a specific recreation activity in a particular recreation

**APPENDIX D – USFS AND BLM CORRELATION OF TERMS AND PROCESSES**

USFS	BLM	Definition
		<p>setting to enjoy desired recreation experiences and other benefits that accrue. Recreation opportunities include non-motorized, motorized, developed, and dispersed recreation on land, water, and in the air (36 CFR 219.19).</p> <p>The social, managerial, and physical attributes of a place that, when combined, provides a distinct set of recreation opportunities. The Forest Service uses the recreation opportunity spectrum to define recreation settings and categorize them into six distinct classes: primitive, semi-primitive non-motorized, semi-primitive motorized, roaded natural, rural, and urban (36 CFR 219.19).</p> <p>The set of recreation settings and opportunities on the National Forest System that is ecologically, economically, and socially sustainable for present and future generations (36 CFR 219.19).</p>
FSH 1909.12 13.32 Range	Land health assessment (LHA)	The regulations in 43 CFR subpart 4180 require BLM State Directors in consultation with Resource Advisory Councils (RACs) to develop Land Health Standards for lands within their jurisdiction. The BLM conducts land health assessments to report progress towards meeting these standards.
Ecological integrity		The quality or condition of an ecosystem when its dominant ecological characteristics (for example, composition, structure, function, connectivity, and species composition and diversity) occur within the natural range of variation and can withstand and recover from most perturbations imposed by natural environmental dynamics or human influence. The plan must include plan components, including standards or guidelines, to maintain or restore the ecological integrity of terrestrial and aquatic ecosystems and watersheds in the plan area, including plan components to maintain or restore structure, function, composition, and connectivity.
Ecosystem services		<p>Benefits people obtain from ecosystems, including:</p> <p>Provisioning services, such as clean air and fresh water, energy, fuel, forage, fiber, and minerals;</p> <p>Regulating services, such as long term storage of carbon; climate regulation; water filtration, purification, and storage; soil stabilization; flood control; and disease regulation;</p> <p>Supporting services, such as pollination, seed dispersal, soil formation, and nutrient cycling; and</p> <p>Cultural services, such as educational, aesthetic, spiritual and cultural heritage values,</p>

**APPENDIX D – USFS AND BLM CORRELATION OF TERMS AND PROCESSES**

USFS	BLM	Definition
		recreational experiences and tourism opportunities.
Priority watersheds		The Planning Rule requires land management plans to Identify watershed(s) that are a priority for maintenance or restoration.
Sustainability (social and economic)		The Planning Rule requires that the plan must include plan components, including standards or guidelines, to guide the plan area’s contribution to meeting the needs of the present generation without compromising the ability of future generations to meet their needs. “Social sustainability” refers to the capability of society to support the network of relationships, traditions, culture, and activities that connect people to the land and to one another and support vibrant communities. “Economic sustainability” refers to the capability of society to produce and consume or otherwise benefit from goods and services including contributions to jobs and market and nonmarket benefits.
Natural Range of Variation		USFS intent is to promote ecosystem integrity in the plan area. However, it may not be possible or appropriate to strive for returning key characteristics to past conditions throughout the plan area. The goal of understanding natural range of variation is to help design plan components to maintain or restore the integrity of the diversity of terrestrial, riparian, and aquatic ecosystems and habitat types throughout the plan area provide an ecosystem (coarse-filter) approach to maintaining the persistence of native species.
Management area		A land area identified within the planning area that has the same set of applicable plan components. A management area where plan components apply does not have to be spatially contiguous.
Stressors		Factors that may directly or indirectly degrade or impair ecosystem composition, structure or ecological process in a manner that may impair its ecological integrity, such as an invasive species, loss of connectivity, or the disruption of a natural disturbance regime.
Drivers		System driving processes, including dominant ecological processes, disturbance regimes, and stressors, such as natural succession, wildland fire, invasive species, and climate change; and the ability of terrestrial and aquatic ecosystems on the plan area to adapt to change.
Adaptive Management		The general framework encompassing the three phases of planning: assessment, plan development, and monitoring (36 CFR 219.5). This framework supports decision-

**APPENDIX D – USFS AND BLM CORRELATION OF TERMS AND PROCESSES**

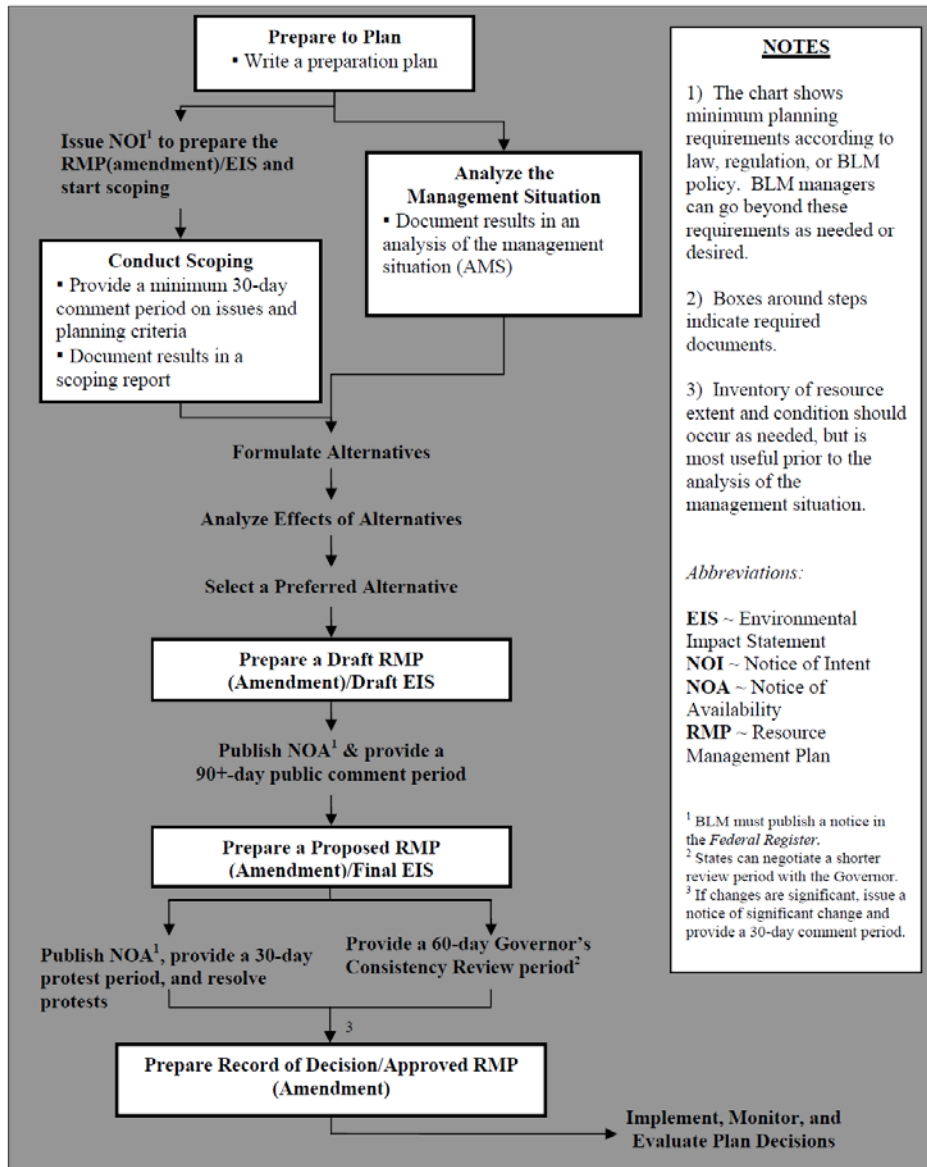
USFS	BLM	Definition
		making that meets management objectives while simultaneously accruing information to improve future management by adjusting the plan or plan implementation. Adaptive management is a structured, cyclical process for planning and decision-making in the face of uncertainty and changing conditions with feedback from monitoring, which includes using the planning process to actively test assumptions, track relevant conditions over time, and measure management effectiveness.
Areas of Influence		An area influenced by the management of the plan area that is used during the land management planning process to evaluate social, cultural, and economic conditions. The area is usually a grouping of counties.
Climate Change Adaptation		Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. This adaptation includes initiatives and measures to reduce the vulnerability of natural and human systems against actual or expected climate change effects. Adaptation strategies include the following: <ol style="list-style-type: none"> <li>1. Building resistance to climate-related stressors.</li> <li>2. Increasing ecosystem resilience by minimizing the severity of climate change impacts, reducing the vulnerability, and/or increasing the adaptive capacity of ecosystem elements.</li> <li>3. Facilitating ecological transitions in response to changing environmental conditions.</li> </ol>
Connectivity		Ecological conditions that exist at several spatial and temporal scales that provide landscape linkages that permit the exchange of flow, sediments, and nutrients; the daily and seasonal movements of animals within home ranges; the dispersal and genetic interchange between populations; and the long distance range shifts of species, such as in response to climate change (36 CFR 219.19).
Desired Conditions		A description of specific social, economic, and/or ecological characteristics of the plan area, or a portion of the plan area, toward which management of the land and resources should be directed. Desired conditions must be described in terms that are specific enough to allow progress toward their achievement to be determined, but do not include completion dates (36 CFR 219.7(e)(1)(i)). Desired conditions are achievable, and may reflect social, economic, or ecological attributes, including ecosystem processes and functions.

**APPENDIX D – USFS AND BLM CORRELATION OF TERMS AND PROCESSES**

USFS	BLM	Definition
Essential Fish Habitat		Those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity for species managed in Fishery Management Plans under the Magnuson-Stevens Fishery Conservation and Management Act.
Focal Species		A small subset of species whose status permits inference to the integrity of the larger ecological system to which it belongs and provides meaningful information regarding the effectiveness of the plan in maintaining or restoring the ecological conditions to maintain the diversity of plant and animal communities in the plan area. Focal species would be commonly selected on the basis of their functional role in ecosystems (36 CFR 219.19).
Geographic Area		A spatially contiguous land area identified within the planning area. A geographic area may overlap with a management area (36 CFR 219.19).
Inherent Capability of the Land		The ecological capacity or ecological potential of an area characterized by the interrelationship of its physical elements, its climatic regime, and natural disturbances (36 CFR 219.19).
Integrated Resource Management		Multiple use management that recognizes the interdependence of ecological resources and is based on the need for integrated consideration of ecological, social, and economic factors (36 CFR 219.19).
Monitoring		A systematic process of collecting information to evaluate effects of actions or changes in conditions or relationships (36 CFR 219.19).
Native Knowledge		A way of knowing or understanding the world, including traditional, ecological, and social knowledge of the environment derived from multiple generations of indigenous peoples' interactions, observations, and experiences with their ecological systems.
Resilience		The ability of an ecosystem and its component parts to absorb, or recover from the effects of disturbances through preservation, restoration, or improvement of its essential structures and functions and redundancy of ecological patterns across the landscape.
Riparian Management Zone		Portions of a watershed where riparian-dependent resources receive primary emphasis, and for which plans include plan components to maintain or restore riparian functions and ecological functions (36 CFR 219.19).



**1 Figure 1 BLM Required Steps for RMPs (BLM Land Use Planning Handbook)**



**NOTES**

1) The chart shows minimum planning requirements according to law, regulation, or BLM policy. BLM managers can go beyond these requirements as needed or desired.

2) Boxes around steps indicate required documents.

3) Inventory of resource extent and condition should occur as needed, but is most useful prior to the analysis of the management situation.

*Abbreviations:*

EIS ~ Environmental Impact Statement  
 NOI ~ Notice of Intent  
 NOA ~ Notice of Availability  
 RMP ~ Resource Management Plan

<sup>1</sup> BLM must publish a notice in the *Federal Register*.  
<sup>2</sup> States can negotiate a shorter review period with the Governor.  
<sup>3</sup> If changes are significant, issue a notice of significant change and provide a 30-day comment period.

2  
3

**APPENDIX D – USFS AND BLM CORRELATION OF TERMS AND PROCESSES**

1  
2  
3  
4

**Figure 2 USFS Required Steps in Planning, NEPA, and Public Opportunities to Participate in Plan Revision (USFS 2012 Planning Rule) (bold italicized text indicates differences between USFS and BLM RMP process).**

Planning Timeline						
Planning Process						
Assessment	Preliminary identification of <b><i>need to change the plan</i></b>	Development of plan components and other plan content for proposed plan	Seek public comment on proposed plan	Develop plan	Objection Process	Plan approval
National Environmental Policy Act (NEPA) Process						
	Scoping ( <b><i>flexibility to begin scoping at any point in the assessment and planning process</i></b> ) Review results of scoping. Identify purpose and need based on need to change the plan	Identify alternatives Describe affected environment Estimate effects of each alternative Develop environmental impact statement	Seek public comment on draft environmental impact analysis (EIS) and preferred alternative	Consider comments and respond to comments.  Develop final EIS and draft plan decision	Issue errata sheet or supplemental EIS if needed	Record of decision approving the plan
Opportunities for Public Participation						
<b><i>Formal notice starting assessment</i></b> *	Formal notice of starting plan revision*	Inform public of results of scoping	Formal notice of availability of DEIS and proposed plan*		Formal notice to begin objection period (availability of FEIS, final plan, and draft plan decision document*	Formal notice of plan approval*
<b><i>Public engagement in assessment.</i></b>	Formal notice of intent to develop EIS (when scoping starts)*  Public engagement in planning process and scoping process.	<b><i>Public engagement</i></b>	Public engagement	Public engagement	Notice of objections filed in the newspaper of record	Public engagement about plan approval

5 \* Formal notice means notice in the Federal Register and the newspaper of record.