

**U.S. Department of the Interior
Bureau of Land Management
and
U.S. Department of Agriculture
Forest Service**

Preliminary Environmental Assessment

DOI-BLM-NV-L010-2011-0036-EA

September, 2014

Overland Pass Habitat Improvement Project



**South Ruby Mountains
White Pine and Elko Counties, Nevada**

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LIST OF ACRONYMS & ABBREVIATIONS

AMSL	Above Mean Sea Level
ATV	All-Terrain Vehicle
AUM	Animal Unit Month
BGEPA	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
BMP	Best Management Practice
BpS	Biophysical Setting
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CESA	Cumulative Effects Study Area
CFR	Code of Federal Regulations
CO₂	Carbon Dioxide
CWE	Cumulative Watershed Effects
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ERA	Equivalent Roaded Acreage
ESA	Endangered Species Act
FRCC	Fire Regime Condition Class
GHG	Greenhouse Gas
GIS	Geographic Information System
HFRA	Healthy Forest Restoration Act
HMA	Herd Management Areas
HUC	Hydrologic Unit Code
IRA	Inventoried Roadless Area
KOP	Key Observation Point
LRMP	Land and Resource Management Plan
MBTA	Migratory Bird Treaty Act
MOU	Memorandum of Understanding
mph	Miles Per Hour
NAAQS	National Ambient Air Quality Standards
NAC	Nevada Administrative Code
NDEP	Nevada Department of Environmental Protection
NDOW	Nevada Department of Wildlife
NEPA	National Environmental Policy Act
NFS	National Forest System
NHD	National Hydrography Dataset
NHPA	National Historic Preservation Act of 1966 (as amended)
NHT	National Historic Trails
NOC	Notice of Opportunity to Comment
NOI	Notice of Intent
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
OHV	Off-Highway Vehicle
PGH	Preliminary General Habitat

PMU	Population Management Unit
PPH	Preliminary Priority Habitat
Project	Overland Pass Habitat Improvement Project
RFFA	Reasonably Foreseeable Future Actions
RMP	Resource Management Plan
ROS	Recreation Opportunity Spectrum
ROW	Rights-of-Way
SIO	Scenic Integrity Objective
SHPO	State Historic Preservation Office
SMS	Scenery Management System
SOPA	Schedule of Proposed Actions
TCP	Traditional Cultural Property
U.S.	United States
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
VRM	Visual Resource Management
WHT	Wild Horse Territory

1.0 INTRODUCTION

The purpose of this Environmental Assessment (EA) is to disclose the direct, indirect, and cumulative environmental impacts of the Proposed Action and No Action Alternative for the Overland Pass Habitat Improvement Project (Project). This is a cooperative project between the Bureau of Land Management (BLM) Ely District, Egan Field Office and the United States Forest Service (USFS) Humboldt-Toiyabe National Forest, Ruby Mountains Ranger District. The Nevada Department of Wildlife (NDOW) is also a cooperating agency for this Project.

This document has been prepared in accordance to the requirements of the National Environmental Policy Act of 1969 (NEPA), the Council of Environmental Quality Regulations Title 40 Code of Federal Regulations (CFR) Part 1500-1508, the BLM NEPA Handbook H-1790-1 (BLM, 2008a), the National Forest Management Act, the Humboldt National Forest Land and Resource Management Plan (LRMP) (USFS, 1986b), and the Ely District Record of Decision and Approved Resource Management Plan (RMP) (BLM, 2008b).

1.1 IDENTIFYING INFORMATION

The BLM Ely District and the USFS Ruby Mountains Ranger District are proposing to conduct vegetation treatments in the Overland Pass area of the southern Ruby Mountains. The proposed treatments would occur over a 10-year period, as budgets allow.

1.1.1 Project Location

The Project is located approximately 57 miles south of Elko, Nevada, in the southern portion of the Ruby Mountains, and is within Elko and White Pine counties. Figure 1.1-1 shows the proposed Project location. The Project Area encompasses both National Forest System (NFS) land in the Ruby Mountains Ranger District, as well as lands administered by the BLM's Egan Field Office. The Ruby Lake National Wildlife Refuge is adjacent to the eastern boundary of the Project Area. Some small in holdings of private land occur within the Project Area, although the proposed Project does not include conducting treatments on these lands. The Project Area encompasses approximately 45,200 acres. The Project is located within all or parts of the following sections:

- Township (T) 24 North (N), Range (R) 56 East (E), Section 1;
- T24N, R57E, Sections 1-6;
- T25N, R56E, Section 2-5, 9-11, 13-16, 21-28, 34-36;
- T25N, R57E, Sections 3-4, 9-11, and 13-36;
- T26N, R56E, Sections 20-22, 27-29, and 32-34; and
- T26N, R57E, Sections 15-16, 21-22, 27, 28, 33, and 34 (Mount Diablo Base and Meridian).

1.2 PURPOSE AND NEED FOR ACTION

1.2.1 Background

Most of the project area is characterized by sagebrush (*Artemisia* sp.) communities in which trees have increased or are increasing in density. The increase in trees is causing a diminished understory which limits plant diversity and forage for wildlife. The increase in tree density and cover has altered these sagebrush communities, causing a departure from reference conditions which does not meet management objectives described in the BLM and USFS's land use plans.

The BLM and USFS propose to conduct vegetation treatments over approximately 18,500 acres within the Project Area over the next 10 years. Various treatment methods (mechanical, prescribed fire, chemical, etc.) would be used to shift vegetation communities closer toward reference conditions and Fire Regime Condition Class (FRCC) 1. Treatments would focus on creating a diverse vegetation community that is resilient to future disturbances and improving habitat for wildlife species.

1.2.2 Need for Project

Vegetation communities in the Project Area have departed from their historic range of variability and are in need of treatment to maintain ecosystem resistance and resilience and restore these communities to their natural vegetative state. Within the Project Area, 10 treatment units have been identified. Areas targeted for treatment are mainly sagebrush (*Artemisia* sp.) communities where singleleaf pinyon (*Pinus monophylla*) and Utah juniper (*Juniperus osteosperma*) have become established. Biophysical setting (BpS) and succession class mapping indicates that approximately 13,000 acres of the sagebrush dominated communities in the Project Area are in an unnatural succession class, which is a community that has uncharacteristic native vegetation cover, structure or composition (e.g., pinyon-juniper established within shrub communities). Additionally, FRCC analysis indicates that approximately 50 percent of the Project Area is classified as having a substantially altered fire regime. Refer to Chapter 3.0, Section 3.17.1 for a detailed discussion of the vegetation communities present in the Project Area.

1.2.3 Purpose of the Project (Goals)

The Project is intended to improve wildlife habitat, reduce fuel loads, and meet the objectives of the BLM Ely District Approved RMP (BLM, 2008b) and USFS's LRMP (USFS, 1986b). Specifically, treatments are anticipated to improve habitat within the Project Area for mule deer (*Odocoileus hemionus*), pronghorn antelope (*Antilocapra americana*), greater sage-grouse (*Centrocercus urophasianus*), and numerous other species that utilize sagebrush communities. Additionally, this Project is intended to improve vegetation diversity and community resistance and resilience, as well as reduce fuel loads and thus also reduce the risk of catastrophic wildfire.

1.2.4 Objectives

Specific objectives, or the purpose, for the Project include the following:

- Reduce the acreage of shrub communities in succession class E (late-seral, closed canopy) and UN (unnatural);
- Reduce the acreage classified with moderately or substantially altered fire regimes (FRCC 2 and 3, respectively);
- Improve or maintain sagebrush cover in the Project treatment areas;
- Reduce fuel loads within the Project Area;
- Increase riparian vegetation and reduce weed cover and density at Cracker Johnson Spring No. 2; and
- Increase the perennial understory cover in treatment units.

1.3 RELATIONSHIP TO PLANNING

1.3.1 BLM

The Proposed Action is in conformance with the Ely BLM RMP (BLM, 2008b). Specifically, the Proposed Action is in conformance with the following resource management goals, objectives, and actions:

Vegetation

Goals

Manage vegetation resources to achieve or maintain resistant and resilient ecological conditions while providing for sustainable multiple uses and options for the future across the landscape.

Objectives

To manage for resistant and resilient ecological conditions including healthy, productive and diverse populations of native or desirable non-native plant species appropriate to the site characteristics.

Management Actions

- VEG-1: Emphasize treatment areas that have the best potential to maintain desired conditions or respond and return to the desired range of conditions and mosaic upon the landscape, using all available current or future tools and techniques.
- VEG-4: Design management strategies to achieve plant composition within the desired range of conditions for vegetation communities, and emphasize plant and animal community health at the mid scale (watershed level).

- VEG-6: Emphasize the conservation and maintenance of healthy, resilient, and functional vegetation communities before restoration of other sites.
- VEG-17: Integrate treatments to: (1) Establish and maintain the desired herbaceous state or early shrub state where sagebrush is present along with a robust understory of perennial species. (2) Prioritize treatments toward restoration of sagebrush communities on areas with deeper soils and higher precipitation.
- VEG-18: Manage native range to meet the requirements of wildlife species. Management will focus on maintaining or establishing diversity, mosaics, and connectivity of sagebrush between geographic areas at the mid and fine scales.

Fish and Wildlife

Goals

Provide habitat for wildlife (i.e., forage, water, cover, and space) and fisheries that is of sufficient quality and quantity to support productive and diverse wildlife and fish populations, in a manner consistent with the principles of multi-use management, and to sustain the ecological, economic, and social values necessary for all species.

Objectives

To manage suitable habitat for aquatic species, priority wildlife species, and migratory birds in a manner that will benefit wildlife species directly or indirectly and minimize conflicts among species and wildlife or habitat losses from permitted activities. Priority species for terrestrial wildlife habitat management related to this project are greater sage-grouse, mule deer, pronghorn antelope, and migratory birds. Priority habitats include calving/fawning/kidding/lambing grounds, crucial summer range, crucial winter range, and occupied habitat. To use wildlife water developments, both natural and artificial, to improve the condition of wildlife habitat, and to use artificial wildlife water developments to mitigate impacts to wildlife species from loss of natural water sources or loss of habitat.

Management Actions

- WL-1: Emphasize management of priority habitats for priority species.
- WL-15: Identify the spatial and temporal habitat needs for those migratory bird species of concern for the sagebrush biome to help achieve the desired range of conditions of the various vegetation communities.

Special Status Species

Goals

Manage public lands to conserve, maintain, and restore special status species populations and their habitats; support the recovery of federally listed threatened and endangered species; and preclude the need to list additional species.

Objectives

To manage suitable habitat for special status species in a manner that will benefit these species directly or indirectly and minimize loss of individuals or habitat from permitted activities.

Management Actions

- S-1: Prioritize conservation, maintenance, and restoration actions for special status species based on the following order of importance: 1) federally listed endangered species; 2) federally listed threatened species; 3) federal proposed species; 4) federal candidate species; and 5) BLM sensitive species.
- SS-37: Manage greater sage-grouse habitat by implementing those actions and strategies identified in the BLM National Sage-Grouse Habitat Conservation Strategy, Greater Sage-Grouse Conservation Plan for Nevada and Eastern California, and local greater sage-grouse conservation plans that the Ely District Office has the authority to implement.
- SS-38: Maintain intact and quality sagebrush habitat. Prioritize habitat maintenance actions from the BLM National Sage-Grouse Conservation Strategy to: 1) maintain large areas of high quality sagebrush currently occupied by greater sage-grouse; 2) maintain habitats which connect seasonal sagebrush habitats in occupied source habitats; and 3) maintain habitats that connect seasonal sagebrush habitats in occupied isolated habitats.
- SS-39: Implement proactive and large scale management actions to restore lost, degraded, or fragmented sagebrush habitats and increase greater sage-grouse populations. Prioritize habitat restoration actions from the BLM National Sage Grouse Conservation Strategy to: 1) reconnect large patches of high quality seasonal habitats, which greater sage-grouse currently occupy; 2) enlarge sagebrush habitat in areas greater sage-grouse currently occupy; 3) reconnect stronghold/source habitats currently occupied by greater sage-grouse with isolated habitats currently occupied by greater sage-grouse; 4) reconnect currently occupied and isolated habitats; 5) restore potential sagebrush habitats that currently are not occupied by greater sage-grouse. Develop allowable use restrictions in greater sage-grouse habitats undergoing restoration, on a case-by-case basis, as dictated by monitoring.

Visual Resources

Goals

Manage public land actions and activities in a manner consistent with Ely District Office visual resource management class objectives.

Objectives

To implement multiple use activities within the planning area with mitigation measures consistent with the visual resource management classes.

Management Actions

- VR-4: Manage the Pony Express National Historic Trail corridor under Visual Resource Management Class II objectives.

Fire

Goals

Provide an appropriate management response to all wildland fires, with emphasis on firefighter and public safety, consistent with overall management objectives. Return fire to its natural role in the ecological system and implement fuels treatments, where applicable, to aid in returning fire to the ecological system. Establish a community education program that includes fuels reduction within the wildland urban interface to create fire-safe communities.

Objectives

To manage wildland and prescribed fires as one of the tools in the treatment of vegetation communities and watersheds to achieve the desired range of condition for vegetation, watersheds, and other resource programs (e.g., livestock, wild horses, soils, etc.).

Management Actions

- FM-4: Incorporate and utilize FRCC as a major component in fire and fuels management activities. Use FRCC ratings in conjunction with vegetation objectives (see the discussion on Vegetation Resources) and other resource objectives to determine appropriate response to wildland fires and to help determine where to utilize prescribed fire, wildland fire use, or other non-fire (e.g., mechanical) fuels treatments.
- FM-5: In addition to fire, implement mechanical, biological, and chemical treatments along with other tools and techniques to achieve vegetation, fuels, and other resource objectives.

Noxious and Invasive Weeds

Goals

Prevent the introduction and spread of noxious and invasive weeds and to control or eradicate existing populations.

Objectives

To reduce the introduction of, and areal extent of, noxious and invasive weed populations and the spread of these populations.

Management Actions

- WEED-1: Continue to use integrated weed management to treat weed infestations and use principles of integrated pest management to meet management objectives and to reestablish resistant and resilient native vegetation communities.

1.3.2 USFS

The management requirements necessary for achieving forest-wide goals and objectives are referred to interchangeably as "standards" and "guidelines" in the LRMP (USFS, 1986b). Goals and objectives define the direction of forest-wide management (USFS, 1986b). Goals are broad definitions of what will be achieved, while objectives are aimed at achieving those goals. The following forest management goals listed in the Humboldt LRMP are applicable to the proposed Project:

Recreation

- Goal #9: Provide for a pleasing visual landscape in the Humboldt National Forest Service.
- Goal #10: Identify, protect interpret and manage significant cultural resources.

Wildlife and Fisheries

- Goal #13: Improve the quality and quantity of lake and stream habitats through increased coordination with other land use programs, cooperation with the NDOW, and direct habitat improvement.
- Goal #14: Improve the current productive level of wildlife habitat with emphasis on maintaining or improving limiting factors, such as big game winter ranges (measured in acres), in cooperation with the NDOW.

Range

- Goal #16: Manage all allotments to maintain suitable range presently in satisfactory ecological condition, and improve suitable range that is in less than satisfactory condition.
- Goal #17: Produce a sustained yield of forage on all lands available and suitable for livestock grazing while maintaining or enhancing the productivity of the land.
 - Objective: Complete vegetative treatment projects that are prescribed in allotment management plans that are compatible with other resources and are cost effective.
- Goal #19: Reduce conflicts between livestock and wildlife for forage on key winter ranges.
- Goal #20: Manage the Cherry Springs, Monte Cristo, and Quinn Wild Horse Territories in accordance with the Wild Horse and Burro Act and the approved territory plans.
- Goal #21: Maintain sensitive plant species.
- Goal #24: Emphasize the control of priority one noxious weeds.

- Objective: Cooperate with counties and others in controlling noxious weeds and poisonous plants.
- Objective: Re-treat those areas where priority one noxious weeds have not been eliminated and concentrate new treatment on those areas posing the greatest threat.

Timber

- Goal #25: Harvest woodland products in coordination with other resources and provide for integrated pest management. The long-range objective is to manage wood products in an orderly long-term manner.
- Goal #26: Promote the utilization of fire-killed trees, chainings, and green pinyon-juniper through an aggressive firewood program.
 - Objective: Design sales of green softwoods to accomplish silvicultural, fuel management, wildlife, and other resource management goals.
 - Objective: Open pinyon-juniper areas planned for type conversion for greenwood cutting prior to chaining or burning.
- Goal #28: Determine the management potential of the pinyon-juniper cover type by conducting an inventory to identify the management needs and opportunities and productivity levels, and subsequently identifying acceptable harvest levels.

Soil and Water

- Goal #29: Provide water and soil resource input to other resource activities to protect and improve water quality and soil productivity.
- Goal #32: Design and implement practices on-the-ground that will re-establish acceptable soil, hydrologic, and vegetative conditions which are sufficient to secure and maintain favorable flows.
- Goal #33: Identify habitat types on the forest to assist management decisions concerning resource use.

Protection (Fire)

- Goal #52: Establish and maintain fuel mosaics which result in an acceptable hazard and spread potential of wildfire, allow appropriate wildfire suppression, and contribute to other resource programs and aesthetics.
 - Objective: Use prescribed fire when cost effective to achieve other resource vegetative manipulation objectives such as for timber, wildlife or range management.
 - Objective: Vegetation modification projects should be designed to break up continuous fuel types.

- Objective: Utilization will be stressed as the primary method of fuel reduction with follow-up treatment and/or burning as needed.

Management direction and standards and guidelines are also provided in the LRMP for each resource as described in Table 1.3-1.

Table 1.3-1 Forest-Wide Management Direction and Standards and Guidelines

Practice	Management Direction	Standards and Guidelines
Recreation Opportunity Spectrum and Visual Quality Objectives	Manage for the Recreational opportunity spectrum as inventoried.	-
	Maintain the present amount of Recreation Opportunity Spectrum (ROS) primitive and semi-primitive non-motorized area.	Allow no new permanent roads except for mineral project.
	Manage the visual landscape as inventoried, with planned visual quality objectives.	-
	Rehabilitate or mitigate visually unacceptable conditions and facilities.	Inventory visually acceptable conditions.
Cultural Resource Planning, Inventory, Evaluation, Nomination, Protection/Enhancement	-	A cultural resource inventory will be conducted prior to the decision which could have an effect on significant sites in areas where previous surveys and evaluations have not been accomplished. Resource activities impacting known cultural resources will allow for evaluation, and where needed, mitigation of impacts prior to project implementation.
Wildlife and Fish	Maintain productivity of wildlife habitat through direct habitat improvement and coordination with other land use programs.	Provide terrestrial and aquatic habitat analysis input for fuelwood removal, road construction projects, range allotment planning and development, water rights adjudication, hydropower development, and mineral exploration and development taking plan on the National Forest.
	Cooperate with NDOW in managing wildlife habitat.	Involve NDOW in programs and activities that affect wildlife and fish habitats and perform joint monitoring of these habitats.
	Provide habitat for sensitive and Federally listed threatened and endangered species.	-
	Protect and improve key or important habitat.	Protect key sage-grouse breeding complexes such as strutting grounds and associated nesting areas.
	Improve or maintain the quality and quantity of terrestrial and riparian habitats.	Vegetation manipulation projects will be designed to consider the needs of wildlife.

Practice	Management Direction	Standards and Guidelines
Wildlife and Fish (continued)		Sagebrush control will not be conducted on any known or identified key sage grouse range except to maintain or improve grouse habitat.
		Vegetation manipulation projects will be permitted within key deer winter range to the extent they maintain or enhance the area for deer.
		Vegetation manipulation projects will be designed to create desirable edge effects and leave islands of untreated vegetation where needed for thermal and escape cover
		A 100-foot strip of living sagebrush or a distance determined by an Interdisciplinary Team will be retained around original meadow boundaries and around patches of aspen when conducting vegetative manipulation projects.
Range Resource Planning	Reduce conflicts between livestock and wildlife.	Coordinate livestock grazing with the wildlife habitat improvement program.
Range Resource Improvement	Livestock grazing will not be allowed for two years following prescribed fire, plantings, and seedings.	Rehabilitate wildfire areas to maintain or improve ecological conditions.
Noxious Weed Control	Cooperate with counties and others in controlling noxious weeds and poisonous plants.	Treat new infestations and priority one weeds first.
Timber Inventory	Inventory existing woodlands to determine fuelwood, post, poles, and Christmas tree supplies.	-
Reforestation	Encourage the enhancement of the forest timber resources for wood products, wildlife habitat, and aesthetics.	-
Timber Harvest Administration	-	Provide for access where needed to harvest dead and green firewood.
	Maintain traditional pine nut gathering areas.	-
Soil and Water	Soils will be managed to maintain productivity and quality.	Where possible avoid soil disturbing activities where rehabilitation measures cannot restore or stabilize the site following disturbance.
		Adopt soil and water conservation practices in the development of projects.

Practice	Management Direction	Standards and Guidelines
Soil and Water (continued)		Where soil has been severely disturbed by management activities and the establishment of vegetation is needed to prevent erosion, the soil will be prepared, fertilized and seeded following recommendations of an Interdisciplinary Team.
	Identify and adopt all soil and water conservation measures applicable to the Forest and monitor effects on soil erosion and water quality in accordance with PL.92-500.	Allow resource development activities that can be mitigated to meet Federal, State, and local water quality standards.
	Comply with state water quality standards.	-
	Establish a monitoring schedule for soil and water when the need arises, due to impacts from other resource activities.	-
Air Quality	Meet the requirements of the State Air Quality Implementation Plan.	-
	Manage the airshed over the Forest to meet class II air quality standards.	-
Riparian Area Management	Protect or improve riparian dependent resources.	Protect and encourage the reestablishment of riparian vegetation.
		Strive to achieve and maintain at least 90 percent of the natural bank stability for streams supporting Lahontan or Bonneville cutthroat trout and 80 percent for all other streams.
		Protect wet areas around springs for wildlife habitat, livestock grazing, and recreational opportunities.
		Management activities or AMP's affecting the riparian area will be coordinated with appropriate Federal, state and local agencies.
		Hand application of herbicides will be allowed provided that herbicides are not allowed to enter water.
		Management activities in riparian areas will be monitored and corrective action will be taken to prevent deterioration of riparian areas or degradation of water quality.

Practice	Management Direction	Standards and Guidelines
Fuel Management	Fuels treatment and maintenance will be used to reduce the cost of fire suppression and break up fuel continuity.	Utilization will be the primary method of fuel reduction.
	Use prescribed fire by planned ignition, when cost effective, to manipulate vegetation to benefit timber, wildlife, range or recreation.	Prescribed burning will comply with State air quality standards.
	-	Fuels reduction program will be directed towards high risk areas and high valued facilities.
	-	Coordinate planned ignition with state agencies, cooperators and potentially affected individuals.

1.3.3 Relationship to Statutes, Regulations, or Other Plans

The proposal is consistent with other Federal, State, and local plans or decisions including, but not limited to, the following:

Elko County Public Land Use and Natural Resource Management Plan (Elko County, 2010)

Directive 19-1: Identify, protect and preserve wildlife species and habitats. Wildlife and fisheries' populations are recognized as a renewable resource and therefore should be managed accordingly. Coordination of federal and state wildlife and fisheries' management and enforcement is encouraged.

Directive 19-3: Identify habitat needs of wildlife species, such as adequate forage, water, cover, etc. and provide for those needs in time, to attain reasonable population levels compatible with other multiple uses.

White Pine County Public Lands Policy Plan (WPCPLUAC, 2007)

Policy 9-5: Identify habitat needs for wildlife species, such as adequate forage, water, cover, etc. and provide for those needs so as to, in time, attain appropriate population levels compatible with other multiple uses as determined by public involvement (page 27).

Policy 9-7: Support habitat restoration to improve wildlife habitat when compatible with other uses (page 27).

White Pine County Portion (Lincoln/White Pine Planning Area) Sage Grouse Conservation Plan (Sage-grouse Technical Review Team, 2004)

The plan was developed by a Coordinated Resource Management Steering Committee comprised of the State of Nevada, USFS, the National Park Service, BLM, private property owners, Native

American tribes, and the public. The Project meets the following strategies identified under Goals, Objectives, and Strategies of the plan:

- Goal 3: Manage for diverse, healthy, sagebrush plant communities within each population management unit (PMU).
 - Objective 3.1: Maintain and improve existing sagebrush plant communities.
 - Strategy 3.1.4: Identify undesirable weed infestations and aggressively treat them to prevent spread.
 - Strategy 3.1.8: Encourage re-seeding of disturbed area with plants beneficial to sage-grouse.
 - Strategy 3.1.9: Identify decadent sagebrush stands and apply management treatments to replace decadent sagebrush with young, healthy, robust plants.
 - Objective 3.2: Where appropriate restore dynamic sagebrush plant communities throughout each PMU.
 - Strategy 3.2.1: Identify all sagebrush sites that have become dominated by P-J and prioritize for projects.
 - Strategy 3.2.3: Use all appropriate means (e.g., fire, mechanical, and chemical, etc.) to treat pinyon-juniper sites that have the potential to support sagebrush habitats.
 - Strategy 3.2.4: Use all appropriate means (e.g., fire, mechanical, or chemical methods) to treat senescent or degraded sagebrush communities to restore age class diversity.
 - Objective 3.3: Restore disturbance regimes, especially fire.
 - Strategy 3.3.1: Properly implement the Ely BLM District Managed Natural and Prescribed Fire Plan to benefit the ecological processes and systems associated with healthy sagebrush communities.
 - Strategy 3.3.3: Use prescribed fire to reduce heavy fuel loads in identified areas.

Northeastern Great Basin Resource Advisory Council Standards and Guidelines for Rangeland Health (NE RAC, 1997b)

Standard 3: Habitats exhibit a healthy, productive, and diverse population of native and/or desirable plant species, appropriate to the site characteristics, to provide suitable feed, water,

cover and living space for animal species and maintain ecological processes. Habitat conditions meet the life cycle requirements of threatened and endangered species.

Northeastern Great Basin Resource Advisory Council Standards and Guidelines for Vegetation (NE RAC, 1997a)

Sagebrush/Bunchgrass Rangelands:

Guideline 1: Create and maintain a diversity of sagebrush age and cover classes on the landscape through the use of prescribed fire, prescribed natural fire, mechanical, biological and/or chemical means to provide a variety of habitats and productivity conditions.

Guideline 2: Where pinyon pine and/or juniper trees have encroached into sagebrush communities, use best management practices to remove trees and re-establish understory species.

1.3.4 Tiered to NEPA Documents

This EA is tiered to the analysis and effects disclosed in the following NEPA documents:

- Ely Proposed Resource Management Plan/Final Environmental Impact Statement (BLM, 2007a);
- Humboldt National Forest Land and Resource Management Plan, Final Environmental Impact Statement (USFS, 1986a);
- Final Programmatic Environmental Impact Statement – Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States (BLM, 2007b);
- Ely District Integrated Weed Management Plan & Environmental Assessment (BLM, 2010);
- Decision Notice, Finding of No Significant Impact (USFS, 1996a) and Environmental Assessment, Noxious Weed Control Program for the Humboldt-Toiyabe National Forests (USFS, 1996b); and
- Final Environmental Impact Statement – Vegetation Treatments on BLM Lands in Thirteen Western States (BLM, 1991).

1.4 DECISION TO BE MADE

The deciding officials would review the Proposed Action and environmental analysis, based on the purpose and need for the Project, to make the following decisions:

- Whether to approve the Proposed Action as written or with modifications; and

- Whether or not the Project has the potential for significant impacts and if an Environmental Impact Statement (EIS) would need to be prepared prior to the issuance of a decision.

1.5 SCOPING, PUBLIC INVOLVEMENT, AND TRIBAL COORDINATION

The NEPA defines scoping as an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to the Proposed Action. One of the primary purposes of the NEPA is to ensure that environmental considerations are incorporated into Federal decision-making.

During the early stages of the NEPA process, an internal scoping meeting occurred on October 11, 2011, with participants from the BLM, USFS, and NDOW, to allow the resource specialists time to determine if there were issues.

In accordance with the NEPA, public comments were solicited during a 30-day scoping period from February 17 through March 15, 2012. A scoping letter was sent on February 16, 2012, to a list of approximately 138 potentially interested individuals, agencies, and organizations. A Press Release was sent to several local media outlets on February 17, 2012.

As part of the environmental analysis process, the BLM and USFS coordinated with local tribal governments regarding this Project in accordance with the NHPA, the NEPA, the American Indian Religious Freedom Act, the Native American Graves Protection and Repatriation Act, and Executive Order 13007. Tribal coordination has been ongoing throughout the analysis process.

The completion of the EA was delayed for the Project, so in accordance with the NEPA, public comments were solicited for a second time during a 30-day scoping period from April 22 to May 20, 2013. A scoping letter was sent on April 22, 2013 to a list of approximately 138 potentially interested individuals, agencies, and organizations. The USFS published a Notice of Opportunity to Comment (NOC) in the Elko Daily Free Press on September 26, 2013, and mailed the NOC to the list of 138 potentially interested individuals, agencies, and organizations. The NOC allowed for an additional 30-day scoping period, ending on October 28, 2013.

The Project has also been listed on the Humboldt-Toiyabe National Forest Schedule of Proposed Actions (SOPA) since January 2012. The SOPA is available at: <http://www.fs.fed.us/sopa/>.

Internal agency scoping of the Project has been ongoing throughout the life of the Project. An Interdisciplinary Team meeting was held on November 19, 2013, in Ely, Nevada, with BLM, USFS, and NDOW personnel to discuss the Project, Proposed Action, design features, and public comments.

The goal of public involvement is to gain public understanding and participation in the analysis and decision-making process regarding the Proposed Action. The identification of issues for this EA was accomplished by considering public comment and the resources which could be affected by implementation of the Proposed Action.

1.6 IDENTIFICATION OF ISSUES

Through the internal and public scoping process, some issues were identified in regards to the Proposed Action. Identification of issues included review of written and verbal comments received from the public, state and federal agencies, tribal governments, and input from agency resource specialists. Comments received during scoping were evaluated against the following criteria to determine whether or not the issue or concern would be a factor in the analysis process:

- Has the concern been addressed in previous site-specific analysis, such as a previous EIS or through legislative action?
- Is the concern relevant to and within the scope of the decision being made and does it pertain to the Proposed Action?
- Can the concern be resolved through design features (avoiding, minimizing, rectifying, reducing, or eliminating the potential impact)?

Comments received for the Project have been documented and can be reviewed in the Scoping Comment Matrix (Appendix A). All comments and issues received during the various scoping periods have been addressed and the documents have been included in the Administrative Record for the Project. Key issues identified during scoping include the following:

- Cultural Resources;
- Hydrology/Soils;
- National Historic Trails;
- Range Resources;
- Recreation;
- Vegetation;
- Visual Resources;
- Wildlife, including Special Status Species; and
- Wild Horses.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

This chapter describes the Proposed Action and the No Action Alternative.

2.2 ADAPTIVE MANAGEMENT

Given the 10-year timeline of the Project and the need for flexibility in treatment applications throughout the Project Area, adaptive management is proposed to be used for implementation of the Project. Adaptive management allows the use of the primary or other appropriate treatment methods to achieve the objectives set forth for each treatment unit. Additionally, secondary treatments may be conducted within the same areas where primary treatments are conducted to the extent that the objectives for the treatment unit are met. Treatment methods available for consideration include those listed in Section 2.3.1.

Adaptive management, as adapted from the National Research Council and adopted by the United States Department of the Interior, "is a decision process that promotes flexible decision making that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood. Careful monitoring of these outcomes both advances scientific understanding and helps adjust policies or operations as part of an iterative learning process. Adaptive management also recognizes the importance of natural variability in contributing to ecological resilience and productivity. It is not a 'trial and error' process, but rather emphasizes learning while doing. Adaptive management does not represent an end in itself, but rather a means to more effective decisions and enhanced benefits. Its true measure is in how well it helps meet environmental, social, and economic goals, increases scientific knowledge, and reduces tensions among stakeholders."

2.3 PROPOSED ACTION

The Proposed Action is to conduct vegetation treatments in 10 treatment units within the Project Area and conduct riparian restoration at Cracker Johnson Spring No. 2 (Figure 2.3-1), to increase the diversity of herbaceous species and reduce fuel loads. As described in Chapter 1.0, areas targeted for treatment are sagebrush communities where pinyon and juniper trees have become established. The stage of woodland development on sagebrush sites would influence the type of treatment method selected, follow-up treatment methods and management, understory competition, seed pools, and vegetation response following management. As described by Tausch et al. (2009) and Miller et al. (2008) the three stages of woodland succession are as follows:

- Phase I – trees are present but shrubs and grasses are the dominant vegetation that influence ecological processes (hydrologic, nutrient, and energy cycles) on the site;

- Phase II – trees are co-dominant with shrubs and herbs, and all three vegetation layers influence ecological processes on the site; and
- Phase III – trees are the dominant vegetation and the primary plant layer influencing ecological processes on the site. Shrubs no longer dominate the understory.

Stand characteristics can be used to classify the phase of development (e.g., percent of maximum potential tree canopy cover, leader growth, etc.), but specific numbers would vary by site. Early indicators of tree dominance include shrub mortality and reduced leader growth on trees less than 10 feet in height (Tausch et al., 2009). Research by Roundy (2014) suggests a tree dominance index, which relates tree cover to relative tree cover (tree + shrub + tall perennial grass cover), is a better indicator of phase, although the specific numbers would vary by site. Research on numerous sites throughout the Great Basin suggests that Phase I is less than 34 percent relative tree cover, Phase II is 34 to 68 percent relative tree cover, and Phase III is greater than 68 percent relative tree cover (Roundy, 2014).

The total Project Area is approximately 45,220 acres, with the proposed treatment units totaling 18,570 acres. Within the treatment units, approximately 70 to 80 percent of the acreage (13,000 to 14,850 acres) would receive treatment. Areas outside of the treatment units but within the Project Area may receive a hand-thinning treatment (described in Section 2.3.1) to reduce pinyon and juniper trees in sagebrush communities exhibiting Phase I woodland development.

Selecting the appropriate treatment to be applied would involve consideration of the vegetation composition, soils, slope, aspect, elevation, and the current successional and hydrologic state of the sites. In addition to the site conditions, it is equally important to determine how the management unit fits into the overall landscape mosaic, including, but not limited to wildlife habitat values, potential for wildfire, and other existing land use objectives.

2.3.1 Treatment Methods

The principal tree treatment methods under consideration for the Project include chaining, mastication, mulching, whole tree thinning, prescribed fire, hand thinning (both lop and scatter and cut and pile), and greenwood harvest. Additional Project treatments, including seeding, noxious and invasive weed suppression, riparian restoration at Cracker Johnson Spring No. 2, and others, are described further in the following sections.

Maintenance of treatments may be required in the future to maintain desired vegetative conditions. Maintenance (re-treatment or additional treatment) of treated areas may be implemented if the treatment unit and/or the watershed is departing, as indicated through monitoring, from the respective objectives listed. Any maintenance treatments would be held to the same design features listed and described in Section 2.3.2.

2.3.1.1 Chaining

Chaining would be the primary treatment method for those areas of the Project identified for treatment in woodland succession Phases II (late) and III. Soil conditions, such as texture and moisture content would be factored into treatment plans in order to minimize soil compaction and surface disturbance.

Chaining would be accomplished using the Ely Anchor Chain (Navy ship anchor chain with 90-120 pound links and 18-inch railroad iron welded perpendicular to the chain link) pulled between two bulldozers. Chaining treatments would consist of a two-way chaining (chaining the trees twice, once from one direction, then from the opposite direction). Areas that are chained would be aerially seeded with perennial grasses, forbs and shrubs after the first pass, and prior to the final pass. In addition to aerial seeding, seed dribblers attached to the track of the bulldozer may be used to press shrub seeds such as antelope bitterbrush (*Purshia tridentata*) into the soil to promote establishment. Seed mixes would be determined as described below in Section 2.3.1.6. Biomass may be left on-site for natural degradation, or treated with a secondary treatment (e.g., prescribed fire). Fuelwood utilization may be allowed in specific areas after restoration objectives have been accomplished (Section 2.3.1.5).

Chaining would be conducted in a mosaic pattern, to the greatest extent possible, with approximately 200 feet between islands to blend and contrast the treatment area with the surrounding environment and replicate natural disturbance. Treatment edges would be blended or graduated using mechanical or manual tree felling methods or would utilize natural breaks in vegetation to further reduce sharp visual contrast of the area. Islands of untreated trees would be left to provide escape and thermal cover for wildlife, and to meet visual resource objectives. Chaining could occur anytime (outside design feature restrictions), but would generally occur in the late fall or winter months.

Chaining would generally be used where heavy to moderate densities of pinyon and juniper are causing decline of understory shrubs, grasses, and forbs within the Project Area. For the purpose of removing pinyon and juniper trees and maintaining sagebrush communities, chaining would not be a desirable method in areas with less than 10 percent tree cover. Chaining could be used on slopes of less than 20 percent, however this method may be considered on slopes up to 30 percent. Chaining would not be used in areas where selective tree removal is needed to meet treatment objectives. Chaining treatments would be designed to avoid existing and established stands of mahogany (*Cercocarpus* sp.) and where other limiting factors are present, such as wildlife, botany, hydrology, and/or soils.

2.3.1.2 Mastication or Mechanical Whole Tree Thinning

Mastication or mechanical tree thinning would be the preferred treatment method for those areas of the Project in succession Phases II and III and where selective tree thinning is important. Mastication, mulching, and mechanical whole tree thinning includes a cutting head attached to a wheeled or tracked piece of machinery. Mastication grinds brush and trees into small, chipped pieces or mulch that are left on-site. Whole tree mechanical thinning uses an attachment (e.g., feller buncher) that cuts trees at the base. The tree could then be left on-site or moved off-site. Mastication or mechanical tree thinning would be restricted to slopes appropriate for the machinery and attachment being used (generally less than 20 percent slope). These treatment methods allow for selective tree removal (thinning areas or areas with desirable tree species intermixed), and would be used in areas where tree selection is desired, and where mahogany is prevalent within the area. Seeding prior to treatment would be considered in areas where mastication or whole tree thinning is used, especially in late Phase II and most Phase III areas. Criteria for seeding mixes and application is described in Section 2.3.1.6.

Mastication could be used in areas where chaining is impracticable (e.g., due to soil or hydrological conditions), where selective tree retention is needed, where prescribed fire could create unsafe conditions, or where the trees are too large for hand thinning. The mobility of the machines would allow the selective removal of trees to create indistinct edges instead of a straight edge. Mastication could be used either by itself or in conjunction with prescribed burning and chaining to achieve the desired treatment unit objectives.

Biomass created from mastication or mulching equipment would be left on-site to naturally degrade. When masticating or mulching, biomass material depth would be restricted to six inches or less. Whole tree thinning methods could be utilized for biomass removal and utilization, piling, or scattering.

Biomass removal and utilization would be used in areas where the current road structure supports the use of vehicles to transport trees off-site is present. In areas with little to no vehicle access, trees could be cut and piled and disposed of at a later time with prescribed fire (Section 2.3.1.3), or scattered throughout the site. Felled trees would have the limbs removed to decrease visual impacts and to promote decomposition.

Hand thinning, fuelwood harvest, prescribed fire, and seeding, may be used in conjunction with or in addition to the primary methods mentioned above in order to meet the management objectives for each treatment unit.

2.3.1.3 Prescribed Fire

Broadcast prescribed fire operations would target areas with succession Phase I or Phase II woodland development, with the majority of focus on Phase II areas. Broadcast burning would target areas with sufficient perennial understory or at least 10 percent relative cover of desired perennial understory species. Safety, fuels properties, current and expected weather, topography, access, and holding capabilities would determine the proper fire application. BLM and USFS would coordinate with NDOW when developing a burn plan, which would be prepared and approved prior to any prescribed fire application. Drainage bottoms would be avoided to the greatest extent possible, and mosaic patterns would be preferential to block patterns. Control lines for prescribed fire would utilize natural barriers as much as possible. In the event natural barriers cannot be utilized, trees and shrubs would be cut and removed along the prescribed fire boundaries. Vegetation removed along the control line would be piled inside the prescribed fire boundary and burned during firing operations. In some cases, control lines would include scraping and/or digging to expose mineral soil.

Prescribed pile burning could be conducted in hand or mechanical thinning areas where slash material has been piled. However, the need for pile burning will be assessed in the context of wildlife habitat enhancement. Prescribed pile burning would be used where fuel reduction is needed to prevent wildfire potential, and to improve desirable vegetation establishment. To reduce fire spread and to minimize soil heating, uncovered piles would be burned when snow is on the ground or following a precipitation event.

Prescribed burning would be strategically timed to best reduce fuel hazards to acceptable levels that also benefit ecological system health. Prescribed fire would be implemented using a combination of ground and aerial ignition resources. Ground resources would include drip torches and fusees. Aerial fire application would occur through the use of a plastic sphere dispenser or helitorch.

An open burn variance would be obtained from the State of Nevada Bureau of Air Quality for each prescribed fire to ensure state and national air quality standards are met.

2.3.1.4 Hand Thinning

Hand thinning would primarily occur in Phase I woodland development areas within sagebrush habitat, and the goal is to remove the encroaching trees. The main objective would be to halt and reverse establishment of pinyon and juniper trees into the sagebrush dominated habitat. Hand thinning would involve the use of chainsaws to selectively hand cut trees within the treatment area. Hand thinning would primarily be utilized in areas where tree cover densities are less than 20 percent or where slopes exceed 30 percent. This treatment may also be used in denser stands to meet specific treatment objectives. Hand thinning may also be used as a pre-treatment or as a

component of other treatments (e.g., prescribed fire, chaining, and mastication). In the lower bench areas where smaller diameter trees occur or where low tree densities are present, cut material would be left on-site with limbs scattered or placed next to the cut trunk. In areas where higher tree densities occur, cut material could be piled and later burned with prescribed fire or scattered throughout the treatment unit. Cut tree material in greater sage-grouse habitat would be scattered or piled next to the tree trunk to allow better movement of greater sage-grouse through and around the area.

2.3.1.5 Greenwood and Fuelwood Harvest

Treatment areas could be open for public greenwood harvest prior to treatment application. Seasonal or avoidance restrictions (Section 2.3.3) on public greenwood harvest would be the same as described for the proposed treatment for each unit. Following treatments, fuelwood harvest may be allowed in some areas after successful establishment of understory species, but travel would be limited to existing roads and trails.

2.3.1.6 Seeding

Seeding would primarily occur in late Phase II and all Phase III pinyon and juniper expansion areas. Seeding would also occur in areas where the Interdisciplinary Team determines that existing understory vegetation is not sufficient (e.g., less than 10 percent relative cover of desirable perennial grass and forb species). Seeding would occur through aerial application, broadcast with a tractor or all-terrain vehicle (ATV), by dribblers mounted to dozers, or by hand application. Seeding would be conducted during the fall or early winter months, preferably prior to snow fall. Seed mixes would consist of a variety of grasses, forbs, and shrubs that are adapted to the site characteristics. Preference would be given to using a purely native seed mix; however, if it is determined that the threat of recurring wildland fire, invasive species establishment, or site characteristics may prevent achieving the treatment unit objectives, non-native perennials may be utilized to reduce these threats. Seed mixes would be determined by reviewing the ecological site descriptions for the treated areas to determine common species with a high probability of success to accomplish the desired objectives. On NFS lands, any non-native species used in the seed mix would be sterile, comply with USFS policy on plant material use, and all mixes would be approved by a USFS designated plant materials expert before use.

2.3.1.7 Riparian Restoration

Riparian restoration work would be completed at Cracker Johnson Spring No. 2 (Figure 2.3-1). Restoration activities would consist of fencing the spring source and associated riparian vegetation near the spring, treating noxious weeds with herbicide, and installing soil stabilization structures along the banks of the spring and creek. Water would be made available to wildlife, wild horses, and livestock outside of the fenced area. Prior to piping water, the BLM would

obtain concurrence from the water right holder or would obtain a water right for Cracker Johnson Spring No. 2, according to Nevada State Water Law.

The aquatic approved herbicide 2,4-D would be applied to whitetop (*Cardaria draba*) with a backpack or ATV-mounted sprayer within the Cracker Johnson Spring No. 2 area. Riparian vegetation would be planted or seeded around the spring area. Planting would include broadcasting seed followed by raking and/or hand planting seedlings. Matting would be installed along the banks of the spring source and stream channel banks to prevent erosion. Logs or other structures would be installed within the spring area to prevent further headcutting and erosion. The spring source would be fenced using the following specifications:

- The fence would consist of a pipe-rail construction to minimize impacts to wildlife. Refer to Appendix B for specifics on the pipe-rail construction;
- Removal of vegetation would be held to the minimum necessary for construction; and
- Gates with opening devices would be installed on two corners, one on each side of the fence. Finger gates would be installed at one corner of the fence to allow animals to escape if they become trapped inside the enclosure.

2.3.1.8 Invasive Species Suppression

Herbicide treatments could be used to target newly discovered infestations, minimize establishment, and reduce the occurrence of noxious and invasive weeds within the treatment areas. Herbicide could also be applied to areas where invasive cheatgrass dominates the understory, and is preventing successful growth and establishment of perennial species. Herbicide treatments for invasive species or noxious weeds would include the potential use of all BLM approved herbicides and surfactants, both in the *BLM Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* (BLM, 2007b), and the Ely District Record of Decision and Approved RMP (BLM, 2008b), and any herbicides approved in the future using the protocol for identifying, evaluating, and using new herbicides as described in that EIS. Depending on chemical, size of the area and acceptable amount of drift, applications of treatments could include backpack application, pack animal tank application, ATV/utility vehicle tank application, truck or tractor tank application, and aerial application.

Herbicide application would follow all Standard Operating Procedures listed on the label. Herbicide applications on BLM-administered land would follow all Standard Operating Procedures listed in Table 2-8 of the final *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* (BLM, 2007b). Herbicide applications on NFS land would follow regulations and stipulations specified by the USFS, including but not limited to the following:

- Only herbicides in which USFS has a signed Pesticide Use Permit would be used;
- Applicators must follow the USFS National Pollutant Discharge Elimination Permit requirements;
- Treatment locations would be added to the Terra noxious weed database and the FS FACTS database;
- Any requirements specified in the 1996 Noxious Weed Control Program for the Humboldt-Toiyabe National Forests Preliminary EA (USFS, 1996b);
- Any requirements specified in the USFS Manual Supplement No. R42000-2001-1 (USFS, 2001);
- Any requirements specified in the USFS Manual Supplement No. 2000-2004-1 (USFS, 2004); and
- Any requirements specified in the USFS Manual Supplement No. 2000-2011-1 (USFS, 2011b).

2.3.2 Treatment Units

Treatment units within the Project Area have been selected based on the Project's purpose, need and specified objectives. LANDFIRE spatial data were used to map BpS and succession class within the Project Area (LANDFIRE, 2010). BpS represent the vegetation that may have been dominant on the landscape prior to Euro-American settlement and are based on both the current biophysical environment and an approximation of the historical disturbance regime. The succession class characterizes current vegetation conditions with respect to the vegetation species composition, cover, and height ranges of successional states within each BpS. Departure of vegetation characteristics were determined using FRCC values which determines the vegetation, fuels, disturbance regimes, and degree of ecological departure from historic or reference condition.

Vegetation types that deviate from historic reference conditions as described within the BpS models were grouped and 10 treatment units were defined by the majority of the grouped vegetation types. Each treatment unit has unique objectives and treatment types based on the deviations from historic reference conditions (Table 2.3-1).

Table 2.3-1 Treatment Unit Objectives and Preferred Treatment Methods

Unit Name, Number and Acres	Acres			Primary Vegetation Communities*	Specific Treatment Area Objectives/Comments	Preferred Treatment Methods**
	BLM	NFS	Private			
Project Area	-	-	-	Sagebrush – all varieties	Reduce tree cover in Phase I areas to improve greater sage-grouse habitat and reduce predation.	Hand thinning with chainsaws (lop/scatter).
Sestanovich Unit 1 213 acres	0	<1	213	Wyoming big sagebrush and black sagebrush	Improve shrub, forb and grass composition for wildlife; create mosaic patches of tree cover within sagebrush sites; Treatments to occur in Phase II and III woodland areas. Hand cutting could occur on edges of mechanical treatments to maintain visible contrast and in Phase I areas.	Ely chain – double chaining with seeding of shrubs, forbs and grasses within Phase II and III areas. Hand cutting with chainsaws in Phase I and edges of chain areas.
Willow Creek Unit 2 751 acres	<1	749	1	Wyoming big sagebrush, black sagebrush, mountain big sagebrush	Improve shrub, forb and grass composition within Phase II and III areas. Reduce tree cover in Phase I areas to release existing understory composition.	Mastication in Phase II areas; Ely chain in Phase III areas; Aerial seeding prior to any mechanical treatments in late Phase II and all Phase III areas.
Walker Canyon Unit 3 641 acres	0	546	95	Wyoming big sagebrush, black sagebrush, pinyon-juniper	Improve existing shrub, forb and grass composition and reduce tree cover on sagebrush sites.	Mastication or mechanical tree thinning/removal and seeding in late Phase II areas.
North Cherry Unit 4 2,094 acres	0	2,094	0	Wyoming big sagebrush, black sagebrush, pinyon-juniper, mountain big sagebrush	Improve shrub, forb and grass composition within Phase II and III areas. Reduce tree cover in Phase I areas to release existing understory composition.	Mastication/mechanical thinning in Phase II areas; Ely Chain in Phase III areas; Aerial seeding prior to any mechanical treatments in late Phase II and all Phase III areas. Prescribed fire would be conducted in 25-200 acre size patches in Phase I and II areas.
Big Wash Unit 5 4,323 acres	1,539	2,784	0	Wyoming big sagebrush, black sagebrush	Improve understory grass, forb and shrub composition in Phase II and III areas.	Mastication in Phase II areas; Ely Chain and mastication in Phase III areas. Aerial seeding in all areas.

Unit Name, Number and Acres	Acres			Primary Vegetation Communities*	Specific Treatment Area Objectives/Comments	Preferred Treatment Methods**
	BLM	NFS	Private			
Cracker Johnson Unit 6 1,848 acres	1,823	0	25	Mountain big sagebrush, Wyoming big sagebrush, black sagebrush	Improve shrub, forb and grass composition within Phase II and III areas. Reduce tree cover in Phase I areas to release existing understory composition.	Mastication in Phase II areas where mountain mahogany exists; Ely Chain in Phase II and III areas where mountain mahogany is not present. Aerial seeding could occur prior to all treatments.
Overland Pass Unit 7 5,631 acres	4,228	1,403	0	Mountain big sagebrush, Wyoming big sagebrush, black sagebrush	Improve shrub, forb and grass composition within Phase II and III areas. Reduce tree cover in Phase I areas to release existing understory composition.	Mastication in Phase II areas where mountain mahogany exists; Ely Chain in Phase II and III areas where mountain mahogany is not present. Aerial seeding in all areas.
East Bench Unit 8 1,561 acres	507	1,057	0	black sagebrush	Reduce tree cover in Phase I and early Phase II areas to release existing understory composition.	Hand thinning in Phase I areas, possible mastication in early Phase II areas. Prescribed burn piles of pinyon-juniper in Phase II areas.
Lower East Bench Unit 9 697 acres	423	273	0	black sagebrush	Reduce tree cover in Phase I areas to release existing understory composition.	Hand thinning – lop/scatter in Phase I areas.
East Sherman Unit 10 813 acres	0	813	0	pinyon-juniper, mountain mahogany, mountain big sagebrush	Improve understory forbs, shrubs and grasses and provide patches of forage and hiding cover for big game.	Prescribed fire in Phase II areas of pinyon and juniper. Aerial seeding could also occur.

*Vegetation communities determined using BpS from LANDFIRE.

**Subject to change based on site characteristics and budget.

Project Area

While most mechanical, prescribed fire, and herbicide treatments would be confined to the treatment units, hand thinning within Phase I woodland expansion areas could occur throughout the entire Project Area. Trees would be cut with chainsaws and left on-site. Limbs would be stacked next to the tree trunk or scattered within the sagebrush. Slash height would be less than 24 inches after scattered. The objective would be to improve greater sage-grouse habitat by reducing potential predator perches (trees) within the Phase I areas.

Treatment Unit 1 – Sestanovich

Treatment Unit 1 consists of 213 acres of mostly private land (approximately 213 acres private and less than one acre NFS), primarily dominated by pinyon and juniper trees that have become established in sagebrush communities. BLM and USFS are coordinating with the landowner to

conduct treatment. Approximately 80 percent of the unit, or 170 acres would be targeted for treatment. BpS targeted for treatment includes the Great Basin Xeric Mixed Shrublands, Inter-Mountain Basins Big Sagebrush Shrubland, and Inter-Mountain Basins Montane Sagebrush Steppe. The preferred treatment method in this unit would be chaining. Hand thinning would also occur in the Great Basin Pinyon-Juniper Woodland type as this community type occurs adjacent to or intermingled with the sagebrush-dominated communities.

Objectives specific to Treatment Unit 1 include:

- Reduce pinyon pine and juniper density within sagebrush communities by 85 percent;
- Achieve the following succession class distribution within treated communities (+/- five percent): five percent A, 52 percent B, 25 percent C, and 18 percent D;
- Improve greater sage-grouse habitat by maintaining or improving sagebrush canopy cover to 15 to 25 percent, increasing herbaceous foliar cover to a minimum of 10 percent, and reducing standing tree cover in preliminary priority and general habitat;
- Promote browse species (bitterbrush, sagebrush, etc.) within big game habitat; and
- Suppress and stabilize cheatgrass while promoting desired vegetation species.

Treatment Unit 2 – Willow Creek

Treatment Unit 2 consists of 751 acres of public and private land (approximately 749 acres NFS, one acre private, and less than one acre BLM) primarily dominated by pinyon and juniper trees that have become established in sagebrush communities. Approximately 80 percent of that area, or 600 acres would be targeted for treatment. BpS types targeted for treatment include Great Basin Xeric Mixed Shrublands, Inter-Mountain Basins Big Sagebrush Shrubland, and Inter-Mountain Basins Montane Sagebrush Steppe. The goal of the treatments would be to reduce tree cover and improve understory grass and forb composition while maintaining or increasing sagebrush composition and cover. Preferred treatment methods would be chaining and mastication.

Objectives specific to Treatment Unit 2 include:

- Achieve the following succession class distribution within treated sagebrush communities (+/- five percent): 10 percent A, 40 percent B, 20 percent C, 20 percent D, and 10 percent E;
- Improve greater sage-grouse habitat by maintaining or improving sagebrush canopy cover to 15 to 25 percent, increasing herbaceous foliar cover to a minimum of 10 percent, and reducing standing tree cover in priority and general habitat;

- Promote browse species (bitterbrush, mahogany, etc.) within big game habitat; and
- Suppress and stabilize cheatgrass while promoting desired vegetation species.

Treatment Unit 3 – Walker Canyon

Treatment Unit 3 consists of 641 acres of public and private land (approximately 546 acres NFS and 95 acres private) primarily dominated by sagebrush, and pinyon and juniper trees that have become established within the sagebrush community. Approximately 80 percent of that area, or 513 acres, would be targeted for treatment. BpS types targeted for treatment include Great Basin Xeric Mixed Shrublands, Inter-Mountain Basins Big Sagebrush Shrubland, and Inter-Mountain Basins Montane Sagebrush Steppe. The goal of the treatments would be to reduce tree cover and improve understory grass and forb composition while maintaining or increasing sagebrush cover. Preferred treatment methods would be mastication or whole tree thinning (e.g., feller buncher). Chaining could also be considered.

Objectives specific to Treatment Unit 3 include:

- Achieve the following successional class distribution within treated sagebrush communities (+/- five percent): 10 percent A, 40 percent B, 20 percent C, 20 percent D, and 10 percent E;
- Improve greater sage-grouse habitat by maintaining or improving sagebrush canopy cover to 15 to 25 percent, increasing herbaceous foliar cover to a minimum of 10 percent, and reducing standing tree cover in priority and general habitat;
- Promote browse species (bitterbrush, mahogany, etc.) within big game habitat; and
- Suppress and stabilize cheatgrass while promoting desired vegetation species.

Treatment Unit 4 – North Cherry

Treatment Unit 4 consists of 2,094 acres of public land (approximately 2,094 acres NFS) primarily dominated by pinyon and juniper trees that have become established in sagebrush communities. Approximately 70 percent of that area, or 1,465 acres, would be targeted for treatment. BpS types targeted for treatment include Great Basin Xeric Mixed Shrublands, Inter-Mountain Basins Big Sagebrush Shrubland, and Inter-Mountain Basins Montane Sagebrush Steppe. The goal of the treatments would be to reduce tree cover and improve understory grass and forb composition while maintaining or increasing sagebrush cover. Treatments would focus mainly on areas where pinyon and juniper have become established within these communities (succession classes D, E, and UN). Preferred treatment methods would be mastication or whole tree thinning, prescribed fire, and invasive species suppression.

Objectives specific to Treatment Unit 4 include:

- Achieve the following successional class distribution within treated sagebrush communities (+/- five percent): 15 percent A, 35 percent B, 20 percent C, 20 percent D, and 10 percent E;
- Improve greater sage-grouse habitat by maintaining or improving sagebrush canopy cover to 15 to 25 percent, increasing herbaceous foliar cover to a minimum of 10 percent, and reducing standing tree cover in priority and general habitat;
- Promote browse species (bitterbrush, mahogany, etc.) within big game habitat; and
- Suppress and stabilize cheatgrass while promoting desired vegetation species.

Treatment Unit 5 – Big Wash

Treatment Unit 5 consists of 4,323 acres of public land (approximately 2,784 acres NFS and 1,539 acres BLM). Approximately 75 percent of Treatment Unit 5, or 3,250 acres, would be targeted for treatment. Treatments would target Great Basin Xeric Mixed Shrublands, Inter-Mountain Basins Big Sagebrush Shrubland, and Inter-Mountain Basins Montane Sagebrush Steppe BpS types. The Inter-Mountain Basins Montane Riparian System would also be targeted for tree removal. Treatments would focus mainly on areas where pinyon and juniper have become established within these communities (succession classes D, E, and UN). Primary treatments would include chaining, mastication, seeding, hand thinning, and invasive species suppression.

Objectives specific to Treatment Unit 5 include:

- Achieve the following successional class distribution within sagebrush treated communities (+/- five percent): 10 percent A, 40 percent B, 20 percent C, 20 percent D, and 10 percent E;
- Achieve the following successional class distribution within Inter-Mountain Basins Montane Riparian Systems communities (+/- five percent): 23 percent A, 76 percent B, and one percent C;
- Improve greater sage-grouse habitat by maintaining or improving sagebrush canopy cover to 15 to 25 percent, increasing herbaceous foliar cover to a minimum of 10 percent, and reducing standing tree cover in priority and general habitat;
- Reduce tree densities in previous treatments to maintain original project objectives;
- Promote browse species (bitterbrush, mahogany, etc.) within big game habitat;
- Suppress and stabilize cheatgrass while promoting desirable vegetation species; and

- Create mosaics of treated and non-treated areas to mimic a “natural landscape” to meet visual resource objectives and to maintain wildlife cover adjacent to foraging areas.

Treatment Unit 6 – Cracker Johnson

Treatment Unit 6 consists of 1,848 acres of public and private land (approximately 1,823 acres BLM and 25 acres private). Approximately 80 percent of this area, or 1,478 acres, would be targeted for treatment. The following BpS types would be targeted for treatment: Great Basin Xeric Mixed Shrublands, Inter-Mountain Basins Big Sagebrush Shrubland, and Inter-Mountain Basins Montane Sagebrush Steppe. The Inter-Mountain Basins Montane Riparian System would also be targeted for tree removal. Treatments would focus mainly on areas where pinyon and juniper have become established within these communities (succession classes D, E, and UN). Preferred treatment methods would include chaining, mastication, hand thinning, and seeding.

Objectives specific to Treatment Unit 6 include:

- Achieve the following successional class distribution within sagebrush treated communities (+/- five percent): 10 percent A, 40 percent B, 20 percent C, 20 percent D, and 10 percent E;
- Achieve the following successional class distribution within Inter-Mountain Basins Montane Riparian Systems communities (+/- five percent): 10 percent A, 75 percent B, and 15 percent C;
- Improve mule deer habitat by maintaining or improving shrub cover to 15 to 25 percent, increasing herbaceous foliar cover to a minimum of 10 percent, and promoting browse species (bitterbrush, mahogany, etc.) within big game habitat;
- Suppress and stabilize cheatgrass while promoting desirable vegetation species;
- Improve riparian species composition in areas suitable for riparian vegetation; and
- Create mosaics of treated and non-treated areas to mimic a “natural landscape” to meet visual resource objectives and to maintain wildlife cover adjacent to foraging areas.

Treatment Unit 7 – Overland Pass

Treatment Unit 7 consists of 5,631 acres of public land (approximately 4,228 acres BLM and 1,403 acres NFS). Approximately 75 percent of this area, or 4,223 acres, would be targeted for treatment. The following BpS types would be targeted for treatment: Great Basin Xeric Mixed Shrublands, Inter-Mountain Basins Big Sagebrush Shrubland, and Inter-Mountain Basins Montane Sagebrush Steppe. Treatments would focus mainly on areas where pinyon and juniper have become established within these communities (succession classes D, E, and UN). Preferred treatment methods would include chaining, mastication, hand thinning, and seeding.

Objectives specific to Treatment Unit 7 include:

- Achieve the following successional class distribution for treated sagebrush communities (+/- five percent): 25 percent A, 40 percent B, 20 percent C, and five percent D, and 10 percent E;
- Improve mule deer habitat by maintaining or improving shrub cover to 15 to 25 percent, increasing herbaceous foliar cover to a minimum of 10 percent, and creating patches of hiding cover adjacent to foraging areas;
- Promote browse species (bitterbrush, mahogany, etc.) within big game habitat;
- Suppress and stabilize cheatgrass while promoting desirable vegetation species; and
- Create mosaics of treated and non-treated areas to mimic a “natural landscape” to meet visual resource objectives and to maintain cover for wildlife adjacent to foraging areas.

Treatment Unit 8 – East Bench

Treatment Unit 8 consists of 1,561 acres of public land (approximately 1,054 acres NFS and 507 acres BLM). Approximately 80 percent of this area, or 1,249 acres, would be targeted for treatment. The Great Basin Xeric Mixed Shrublands and Inter-Mountain Basins Big Sagebrush Shrubland BpS types would be targeted for treatment. Treatments would focus mainly on areas where pinyon and juniper have become established within these communities (succession classes D, E, and UN). Preferred treatment methods would include hand thinning and mastication.

Objectives specific to Treatment Unit 8 include:

- Achieve the following successional class distribution for treated communities (+/-five percent): 10 percent A, 40 percent B, 40 percent C, and five percent D, and five percent E;
- Improve greater sage-grouse habitat by maintaining or improving sagebrush canopy cover to 15 to 25 percent and reducing standing tree cover in preliminary priority and general habitat;
- Create mosaics of treated and non-treated areas to mimic a “natural landscape” to meet visual resource objectives and to maintain cover for wildlife adjacent to foraging areas;
- Promote browse species (bitterbrush, mahogany, etc.) within big game habitat;
- Reduce tree densities in previous treatments to maintain original project objectives; and
- Suppress and stabilize cheatgrass while promoting desired vegetation species.

Treatment Unit 9 – Lower East Bench

Treatment Unit 9 consists of 696 acres of public land (approximately 423 acres BLM and 273 acres NFS). Approximately 80 percent of this area, or 557 acres, would be targeted for treatment. The Great Basin Xeric Mixed Shrublands and Inter-Mountain Basins Big Sagebrush Shrubland BpS types would be targeted for treatment. Treatments would focus mainly on areas where pinyon and juniper have become established within these communities (succession classes D, E, and UN). The preferred treatment method would be hand thinning.

Objectives specific to Treatment Unit 9 include:

- Achieve the following successional class distribution for treated sagebrush communities (+/- five percent): 10 percent A, 40 percent B, 40 percent C, and five percent D, and five percent E;
- Improve greater sage-grouse habitat by maintaining or improving sagebrush canopy cover to 15 to 25 percent and reducing standing tree cover in priority and general habitat; and
- Suppress and stabilize cheatgrass while promoting desired vegetation species.

Treatment Unit 10 – East Sherman

Treatment Unit 10 consists of 813 acres of public land (approximately 813 acres NFS) primarily dominated by pinyon and juniper trees that have become established in sagebrush communities. Approximately 50 percent of the unit, or 407 acres, would be targeted for treatment. The following BpS types would be targeted for treatment: Inter-Mountain Basins Big Sagebrush Shrubland, Inter-Mountain Basins Montane Sagebrush Steppe, and Great Basin Pinyon-Juniper Woodland. Inter-Mountain Basins Curl-leaf Mountain Mahogany Woodland and Shrubland may also be treated incidentally. The goal of the treatments would be to reduce dense fuel loading and improve understory grass and forb composition and cover. Treatments would focus mainly on areas where tree cover is dense (succession classes D, E, and UN). The preferred treatment method for this unit would be prescribed fire.

Objectives specific to Treatment Unit 10 include:

- Achieve the following successional class distribution within treated communities (+/- five percent): 32 percent A, 26 percent B, 15 percent C, 15 percent D, and 13 percent E;
- Create mosaics of treated and non-treated areas to mimic a “natural landscape” to meet visual resource objectives and to maintain cover for wildlife adjacent to foraging areas;
- Reduce fuel loading in treated areas to provide a fuel break for potential wildfires;

- Promote browse species (bitterbrush, mahogany, etc.) within big game habitat; and
- Suppress and stabilize cheatgrass while promoting desired vegetation species.

2.3.3 Treatment Design Features

The following design features are built in to the Proposed Action in order to minimize or reduce potential impacts of the Project. Design features are listed below by resource category.

2.3.3.1 Wildlife

- Greater sage-grouse – Treatment application would not occur within three miles of active leks from March 1 to June 30, during breeding and nesting season.
- Migratory birds – Avoid treatments during the migratory bird nesting season, March 15 to July 31. If treatment application is to be implemented during the nesting season, a migratory bird nesting survey would be conducted, by which an agency biologist would determine the appropriate survey methods (e.g., timing, frequency, etc.) and restrictions needed prior to implementation to minimize impacts to migratory birds.
- Western Burrowing Owls (*Athene cunicularia hypugea*) - Avoid treatments in areas determined to be potential burrowing owl habitat from March 15 to August 31. If treatment application is to be implemented during this season, a pre-clearance survey would be conducted, by which an agency biologist would determine the appropriate survey methods (e.g., timing, frequency, etc.) and restrictions needed prior to treatment implementation to minimize impacts. Additionally, Project equipment would be stored or staged within occupied burrowing owl habitat.
- Raptors – Avoid conducting treatments from March 1 to August 31 within a half-mile of active raptor nests, unless nest has been determined inactive for at least five years. Pre-treatment surveys would be conducted by a qualified biologist to determine presence and location of any active raptor nests.
- Big game – Avoid conducting treatments within big game calving/fawning/kidding/lambing grounds and crucial summer range from April 15 to June 30.
- Pygmy rabbits (*Brachylagus idahoensis*) – Ground disturbing activities and prescribed fire would occur outside of the pygmy rabbit breeding season, January 15 through June 30, in areas that are deemed as pygmy rabbit habitat by the corresponding land management agency biologist. Pre-treatment surveys would be conducted by a qualified biologist in potential pygmy rabbit habitat to determine presence and location of any pygmy rabbit burrows or colonies. The colonies would be flagged and avoided.
- Treatments would be applied in a mosaic pattern and islands of trees would be left for wildlife cover.

- Speed limits within the Project Area would be restricted to 20 miles per hour (mph) or less during treatment application.
- Agency surveys for the presence of springsnails would be carried out at Cracker Johnson Spring No. 2 prior to treatment.

2.3.3.2 Old-Growth Pinyon and Juniper Trees

Avoid removal of pinyon and juniper trees displaying old-growth characteristics. Old growth trees usually occur on rock outcrops and steep slopes with soils that are shallow, rocky, and coarse textured. Old-growth characteristics include the following from Tausch et al. (2009):

- Crown shape: Flattened, rounded, or uneven tops;
- Branch structure: In open stands, large branches near the base of the tree;
- Deadwood: Dead branches, bark missing, and juniper may be covered by a light green lichen;
- Bark: Juniper - thick and fibrous with well developed furrows; Pinyon - Thick and more plate-like structure than furrowed; and
- Leader growth: Juniper - generally less than one inch in the upper quarter of the tree; Pinyon - generally less than two inches in the upper quarter of the tree.

2.3.3.3 Visual Resources

Mechanical treatments would include runners of trees along the drainages and islands of undisturbed vegetation to maintain diversity for wildlife, to achieve a natural appearance to meet Visual Resource Management (VRM) and Scenic Integrity Objective (SIO) objectives, and provide visual diversity and cohesion with the surrounding landscape. Islands would vary in size, shape, and distribution within the treatment areas. Photo 1 and 2 represent a “natural” appearance of the interface between woodland sites and rangeland sites, with runners of trees along the drainages. Both photos are taken from the same visual observation point. Photo 1 is an aerial photo while Photo 2 is a landscape photo. Prior to Project implementation, drainages and islands would be mapped to produce a mosaic pattern. Remaining trees and undisturbed vegetation would be left in an arrangement similar to that depicted in the photos.



Photo 1 Aerial Photo Depicting an Example of Natural Appearance of Woodland/Rangeland Interface with Runners of Trees along the Drainages and Washes



Photo 2 Photo Depicting an Example of the Natural Appearance of Woodland/Rangeland Interface with Runners of Trees along the Drainages and Washes

To achieve a blended vegetated deviation pattern, boundary edges of all treatments would have a gradual gradient pattern rather than a straight line effect. This gradation provides a variety of sizes and shaped vegetation where trees are removed along the boundary, thereby blending the density of trees to create a natural un-sculpted edge appearance. This same pattern would be applied to all created island buffers within a treatment area.

2.3.3.4 National Historic Trails

The Overland Pass, Pony Express Route, and California Trail are within BLM VRM Class II and USFS SIO Moderate. Class II objectives are to retain the existing character of the landscape. Allowed change is low and activities may be visible, but should not attract attention of the casual observer. Moderate is where the landscape appears slightly altered. Noticeable deviations must remain visually subordinate to the landscape character being viewed.

- In the National Historic Trails (NHT) corridor, mechanical treatments would include runners of trees along washes, drainages, and depressions and islands of trees to achieve a natural appearance and meet VRM objectives. Prior to project implementation, stringers and islands would be mapped to produce a mosaic pattern.
- In the NHT corridor, hand-cutting, “lop and scatter”, and carefully designed mastication treatments would be preferred to chaining, prescribed burn, and other mechanical treatments.
- Treatments in the NHT corridor may include mechanical thinning using mastication, and/or a combination of hand-thinning and mastication techniques. Tree-thinning activities in the viewshed of the NHT would create a natural mosaic with the intent of ultimately restoring the historic fabric of the trail environment.
- Within the NHT corridor, mastication may take place given the following stipulations:
 - A Class III cultural resource inventory would be completed for all ground disturbing treatments. All identified cultural resources would be evaluated for eligibility to the National Register of Historic Places (NRHP). In addition all historic sites within the VRM Class II corridor would be evaluated on an individual basis by their own merit, and as contributing and non-contributing to the NHT’s.
 - No mastication would be conducted within 50 meters of known historic properties and trails. The areas within 50 meter buffers may be treated by hand cutting and removal, with lop and scatter techniques for visual and protective measures.
 - To protect the visual integrity of the trail system and preserve the existing character of the landscape, treatments within the NHT corridor would leave vegetation mosaics and remnant areas of old-growth woodland where they still exist. Mature pinyon trees scattered throughout thinned areas, existing sagebrush,

and native grass communities would remain intact, and natural islands and stringers of standing pinyon/juniper woodland would be left throughout the corridor. This would ensure that the vegetation of the corridor is graduated into surrounding treatments and the environment would be restored to a natural condition similar to the historic environment of the NHTs.

- Screens or shields, including stringers of trees or islands of vegetation would be used to protect views from the NHTs.
- Mastication equipment would use “balloon tires” rather than tracked vehicles.
- Mastication would take place when the ground is dry and firm. Mastication on frozen ground would be optimal.
- Operators would masticate trees in as few passes as possible, and avoid excessive turns, sharp turns, or excessive back and forth movement with the masticator to minimize ground disturbance.
- Mastication would not leave a dense layer of biomass material that may inhibit sagebrush and other plant growth. Any biomass material left on site would be restricted to depths of less than 10 centimeters thick. Some hand clean-up or hand scattering may be necessary.

2.3.3.5 Cultural Resources

The USFS, BLM, and the Nevada State Historic Preservation Office (SHPO) have completed a Draft Programmatic Agreement to avoid impacts to cultural resources within the Project Area (Appendix C). Measures included in the programmatic agreement would be incorporated into all treatments proposed for this Project.

2.3.3.6 Mineral Resources

A survey for mining claim markers in documented active claim sites would be conducted prior to treatment application. All active mining claim marker locations and tag information would be recorded. Active mining claim markers or stakes would be avoided to the extent practical. Active mining claim markers that are destroyed by prescribed burning, thinning, or chaining operations would be re-staked using a legal mining claim marker. The re-staking of mining claim markers would occur in coordination with the existing mining claimants to ensure accurate, legal staking procedures that would minimize damage to claims. Additionally, all active mineral resource operations would be avoided.

If any mining sites or dumps are discovered within the Project Area, operations would be avoided in order to minimize risk from potentially hazardous materials or mine features. Sites would also be reported to the appropriate agency hazardous material coordinator.

2.3.3.7 Land Use and Access

No new roads would be constructed or created during Project implementation. Off-road travel with heavy equipment and vehicles would occur during implementation of mechanical treatments. Any temporary two-track roads or skid trails created during off-road travel would be decommissioned and rehabilitated following treatment. Loading and unloading any equipment would occur on existing roads to minimize off-road disturbances and impacts. Signs would be posted along roads within or adjacent to treatment units in regards to travel restrictions to assist in mitigating impacts of future cross-country travel. No off-road travel would be authorized for harvest of fuelwood by the public, unless specifically allowed by the authorized officer and subject to the following considerations and restrictions that would be determined at the time of authorization:

- Vehicle size limitations;
- Timing restrictions;
- Avoidance areas for sensitive resources;
- Soil conditions;
- Pre-treatment off-road travel could be authorized for greenwood/fuelwood collection in specific areas as long as avoidance areas are closed;
- Off-road travel would not be authorized for the duration of grazing closure for the same area, if applicable;
- Following treatment, off-road travel could be allowed until the biomass has been removed or for a period not to exceed two years following the opening of the area for off-road fuelwood collection; and
- If off-road travel is authorized for fuelwood harvest, the area would be monitored by agency personnel and could be closed if impacts are considered inappropriate.

2.3.3.8 Grazing Management

Coordination with the affected livestock permittees within grazing allotments being treated would be conducted prior to any treatment occurring. Any livestock grazing closure for the purpose of vegetation treatment would be done through the grazing decision or agreement process and would occur prior to the treatment. Except in hand thinning areas, livestock grazing would not be authorized within the treatment areas during implementation of the selected treatments. Livestock grazing may resume within treatment areas that exhibit at least 10 percent foliar cover of desirable perennial grasses and forbs. Seeded areas would be closed to livestock grazing for two growing seasons or until the following vegetation objectives have been met:

- A minimum of five or more desirable perennial plants per square meter are firmly rooted. Desirable perennial plants are those plants that are native or introduced and have the ability to maintain ecosystem processes and provide forage for livestock and wildlife; or
- At least 10 percent foliar cover of desirable perennial grasses and forbs is present.

Monitoring sites would be established prior to Project implementation; however, additional sites may be established within one year following treatment completion. Monitoring locations would be measured annually during the livestock grazing closure period. The closure period may be extended until vegetation objectives have been met. Once objectives are met, livestock grazing would resume as authorized on the grazing permit or through a grazing agreement.

An Interdisciplinary Team would conduct a review of the resource monitoring data and objectives to determine if objectives have been met and when livestock grazing should be resumed. If environmental factors prevent attainment of resource management objectives following the mandatory rest period, an Interdisciplinary Team would review resource monitoring data and determine an appropriate grazing regime with the permittee. Any terms and conditions specific to livestock grazing within the Project Area would also be discussed and included in any annual grazing authorization, which could require a new grazing decision to be issued.

2.3.3.9 Wild Horses

An enforced speed limit would minimize the risk of wild horse and vehicle collisions. Fencing of treatment units is not anticipated; however, if any fencing should be used, it would be designed to not prohibit free roaming behavior of wild horses (e.g., open ended). Gates with opening devices would be installed at the corners of any fences. Finger gates would be installed at each end of any enclosure fence to allow animals to escape if they become trapped.

2.3.3.10 Sensitive Plant Species

Known locations of sensitive plant species, susceptible to major ground disturbance, would be excluded from the treatment areas. Prescribed burning treatments could be implemented, as well as hand thinning activities, for fire adapted sensitive plant species. Currently, there are no known locations of sensitive plant species within the Project Area as described in *Special Status Plant Survey Report for Overland Pass/Big Wash Restoration Project* (ENLC, 2012) (Appendix D).

2.3.3.11 Hydrology

To minimize adverse impacts to channels, soil compaction, and soil loss, disturbance within the 11 12-digit Hydrologic Unit Code (HUC 12) watersheds (same as Level 6 watersheds) overlapping the Project Area would not exceed 15 percent of the total threshold of concern

(TOC), utilizing the Cumulative Watershed Effects Equivalent Roaded Acre Model. Treatment application may be staged over the life of the Project to meet treatment goals, depending on the current watershed condition.

Crossing ephemeral drainage features, washes, or draws would be avoided unless deemed absolutely necessary. If the crossing or entering of drainage features must be undertaken, ingress and egress would be as close to 90 degrees to draw long-axis as possible and with as little bank disturbance as practicable. Slash or woody material of sufficient size and depth could be placed in ephemeral drainage features to protect banks and draw bottoms at designated crossing sites and would be removed when the crossing is no longer needed. Crossing would also not occur during rain events or when soil moisture level is causing rutting. Recontouring of drainage feature banks or bottoms would occur as needed following completion of treatment, restoration of drainage crossing, or otherwise as identified by the agency hydrologist or designee.

2.3.3.12 Cadastral Resources

Surveys would be conducted for cadastral monuments and markers prior to any surface disturbing activities. If any monuments or markers are disturbed, they would be restored after treatment where possible or survey notes updated to reflect such disturbance.

2.3.3.13 Private Land

There are private lands located within the boundaries of proposed treatment units. These private lands would not be treated unless a cooperative agreement is in place between the land management agency and the landholder.

2.3.3.14 Air Quality

A State of Nevada burn variance permit would be required from Nevada Division of Environmental Protection (NDEP) prior to prescribed fire implementation, which deals with smoke management. All national and state air quality standards would be met during Project implementation.

2.3.3.15 Non-Native, Invasive and Noxious Species

On BLM administered lands, stipulations in the Weed Risk Assessment (Appendix E) and the BLM Ely District Integrated Weed Management Plan and Environmental Assessment (BLM, 2009) would be carried out at the time of implementation within each treatment unit. On NFS lands, stipulations identified in Weed Risk Assessment, and USFS Manual 2000-National Forest Resource Management, Chapter 2070, Vegetation Ecology (USFS, 2008) would be carried out at the time of implementation within each USFS treatment unit.

Herbicides could be used to minimize establishment or reduce occurrence of invasive and noxious species within the treatment units. Herbicide application would follow all Standard Operating Procedures listed on the label. Herbicide applications on BLM administered land would follow all Standard Operating Procedures listed in Table 2-8 of the final *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* (BLM, 2007b). Herbicide applications on NFS lands would follow regulations and stipulations specified by the USFS, including but not limited to the following:

- Only herbicides in which the USFS has a signed Pesticide Use Permit would be used;
- Applicators must follow the USFS National Pollutant Discharge Elimination Permit requirements;
- Treatment locations would be added to the Terra noxious weed database and the USFS FACTS database; and
- Any requirements specified in the 1996 Preliminary EA - Noxious Weed Control Program for the Humboldt-Toiyabe National Forests (USFS, 1996b).

Prescribed burning would not occur in areas with a high probability of increasing cheatgrass cover after treatment. The Interdisciplinary Team would determine when prescribed fire could be used as a treatment, based on the understory present at the time of treatment. This assessment would include evaluation of site characteristics and capability, current cover of cheatgrass, and potential to increase cheatgrass after burning.

2.3.3.16 Rights-of-Way

All utility lines and other rights-of-way (ROW) structures would be avoided during treatment application. Above ground structures associated with buried utility lines would also be avoided. Any potential ROW holders within the treatment units would be notified prior to treatment.

2.3.3.17 Fencing

To accomplish the overall and treatment-specific objectives, fencing of all or parts of treatment areas may be required. Fencing may be required to restrict large ungulate (wild and domestic) herbivory on treated areas. All fences for the purpose of restricting ungulate herbivory on treated areas would be temporary in nature and would remain in place only until the vegetation objectives are met. Fencing would be placed on-site in such a way that visual impacts would be minimized to the fullest extent practicable. If possible, existing fences would be utilized to restrict livestock from entering treated areas. Temporary fencing for the purpose of restricting livestock would be installed around treatment areas as needed and would be removed after

objectives for the treatment area had been achieved. Fencing would be open-ended and designed to allow free roaming of wild horses.

Fencing would be built to deer and antelope specifications (i.e., BLM Nevada State Office fence engineering specifications Drawing No. NV-02834-53). This includes a 42-inch high fence with the lowest wire being 16 inches above ground. The fence would be installed using white-top steel posts, three strands of barbed wire, and one smooth strand wire on the bottom. The fence would be flagged with black and white markers to alert wildlife and wild horses of its existence. Markers would be constructed according to Natural Resource Conservation Service (NRCS) specifications (Appendix B). Gates with opening devices would be installed on each end of the fence.

Electrical fencing may be used as a cost-effective alternative that meets the objectives. Electric fencing would typically be three or four strands attached to a fiberglass or metal pole to a height of five or six feet. Corner posts would be constructed of wood. The fencing would be solar powered with a battery box to store electrical charge. The box containing batteries would be camouflaged to the surroundings to the largest degree possible. Electrical fencing would be marked with signs warning the public of the electrical nature of the fence. Electrical fencing would be used until objectives are met.

2.3.4 Monitoring

Effectiveness monitoring would occur at least bi-annually following treatment application to determine effectiveness and recovery. Monitoring would follow agency approved methods. Typical monitoring methods include cover, composition, and density. If effectiveness monitoring does not indicate desired recovery or movement toward objectives within a three to five year period, additional treatments could be prescribed. Supplementary treatments include additional seeding with approved seed mixes, additional pile burning to reduce fuels, hand thinning, fuelwood harvest authorizations, herbicide application, and chaining. Results from effectiveness monitoring could also be used to modify proposed treatments in other units.

2.4 NO ACTION ALTERNATIVE

Under the No Action Alternative, vegetation treatments would not occur and the vegetation communities would continue to decline in health and quality. The existing conditions include areas where pinyon and juniper have created a departure from the historic range of variability for vegetation types. The current departure from the historic range of vegetation type variability results in areas where trees (i.e., pinyon and juniper) are the dominant vegetation and shrubs are no longer the dominate understory, which impacts mule deer and greater sage-grouse habitats, and increases the potential for catastrophic fires. Approximately 13,000 to 14,900 acres of the Project Area are in need of vegetation treatments to improve mule deer and greater sage-grouse

habitat and prevent catastrophic fires. The No Action Alternative would result in continued establishment of pinyon and juniper, and the continued decline of herbaceous vegetation in the understory of the trees. Also, pinyon and juniper trees would continue to encroach sagebrush dominated communities and increase in density where already established, reducing the quality of habitat for greater sage-grouse and other wildlife species as well as the vegetation community resistance and resilience. Hazardous fuels would remain in the Project Area, increasing the risk of catastrophic wildfire.

Cracker Johnson Spring No. 2 would not be restored; however, current resource management would be maintained in the area.

2.5 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL

2.5.1 Elimination of Treatment Methods

Public scoping brought forward some suggestions for elimination of treatment methods, but elimination of all treatments would be similar to the No Action Alternative, which is analyzed in this EA. Elimination of particular treatment methods, such as prescribed fire, would not meet the purpose and need of the Project; therefore, this alternative was not carried forward for detailed analysis.

2.5.2 Hand Thinning Only

Hand thinning as the only treatment method was considered but eliminated from further analysis because it would not meet the purpose and need of the Project. Some of the treatment areas are lacking a desirable perennial understory and would require seeding for a successful response. These areas may also need seedbed preparation to improve success, which is provided by the mechanical treatment methods. The multitude of the treatment methods in the Proposed Action allow for the best method(s) to be used to create desirable outcomes and improve greater sage-grouse and mule deer habitat.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS

3.1 INTRODUCTION

This chapter presents the existing environment (i.e., the physical, biological, social, and economic values and resources) of the Project Area and environmental impacts that could occur as a result of the Proposed Action and No Action Alternative, as described in Chapter 2.0. Individual discussions are presented by resource area.

The affected environment section describes the existing conditions and trend of issue-related elements that may be affected by implementing the Proposed Action. Description of the affected physical, biological, and human resources is based upon data gathered from field investigations, BLM data, USFS data, and data and files from other agencies.

Environmental impacts may include either direct or indirect effects. Direct effects are caused by and occur at the same time and place as the action. Indirect effects are caused by the action, occur later in time or farther removed in distance, and are reasonably foreseeable. Cumulative effects are discussed in Chapter 4.0. Herein, the terms "effect" and "impact" are synonymous.

In accordance with NEPA requirements, an effect should be discussed in terms of context and intensity. In this EA, context refers to the location, type, or size of the area to be affected. Intensity refers to the severity or level of magnitude of an impact. Context is also defined temporally in this EA as temporary, short-term, or long-term, based on the anticipated duration of the effects. The intensity of effects in this EA is defined as major, moderate, minor, or negligible. Effects with major intensity would be equivalent to having a significant impact on a resource. These terms are described in Table 3.1-1.

Table 3.1-1 Definition of Effect Duration and Intensity

Attribute of Effect		Description Relative to Resource
Duration	Temporary	Occurring during treatment activities.
	Short-term	10 years or less.
	Long-term	More than 10 years.
Intensity	Negligible	Alternative would not cause detectable changes in existing conditions and would not have any measureable effects on the resource.
	Minor	Alternative would have detectable changes in existing conditions, but the changes would be slight and generally affect only a limited number or portion of the resource.
	Moderate	Alternative would result in clearly detectable changes in existing conditions and/or would affect a broad range of the resource.

Attribute of Effect		Description Relative to Resource
	Major	Alternative would result in a large, easily measureable change in existing conditions that is severe or exceptional and/or would affect nearly all of the resource across a large, expansive area. Major effects are equivalent to having a significant impact on a resource.

Pursuant to 40 CFR 1500.1(b) and 1500.4, the analysis and information provided herein are summaries of the complete analysis. Unless specifically stated otherwise, additional supporting information, as well analysis assumptions and methodologies, is contained in the Administrative Record, on file with the BLM Ely District and USFS Ruby Mountains Ranger District.

To comply with NEPA, the BLM must address specific elements of the environment, subject to requirements defined by Supplemental Authorities associated with each element as specified by statutes, regulations, or executive orders (BLM, 2008a). Table 3.1-2 identifies the Supplemental Authority elements that are addressed in this EA. Supplemental Authority elements determined to be not present or present yet not affected were not carried forward for analysis or discussed further in the EA. Supplemental Authority elements determined to be present that may be affected were carried forward for analysis in the EA, and are further discussed below. The elimination of elements determined to be not present or not affected follows the Council on Environmental Quality (CEQ) policy, as stated in 40 CFR 1500.4.

Table 3.1-2 Supplemental Authority Elements Considered for Analysis

Supplemental Authority Element*	Not Present	Present/ Not Affected	Present/ May be Affected	Rationale/Reference Section
Air Quality			X	Section 3.2
Areas of Critical Environmental Concern	X			Element not present.
Cultural Resources			X	Section 3.3
Environmental Justice	X			Element not present.
Fish Habitat	X			Element not present.
Floodplains	X			Element not present.
Forests and Rangelands (Healthy Forest Restoration Act (HFRA) projects only)	X			The Proposed Action is not an HFRA project. Element not present.
Human Health and Safety (Herbicide projects only)			X	Section 3.4
Migratory Birds			X	Section 3.5
Native American Religious Concerns			X	Section 3.6
Non-Native, Invasive and Noxious Species			X	Section 3.7
Prime or Unique Farmlands	X			Element not present.
Threatened and Endangered Species			X	Section 3.16
Wastes, Hazardous or Solid	X			Element not present.

Supplemental Authority Element*	Not Present	Present/ Not Affected	Present/ May be Affected	Rationale/Reference Section
Water Quality (Surface and Ground)			X	Section 3.8
Wetlands and Riparian Zones			X	Section 3.9
Wild and Scenic Rivers	X			Element not present.
Wilderness/Wilderness Study Area/Lands with Wilderness Characteristics	X			Element not present.

*See H-1790-1, Appendix 1, Supplemental Authorities to be Considered (BLM, 2008a).

In addition to the resources or elements managed under supplemental authorities, other resources of the human environment that have been considered for analysis in this EA are listed in Table 3.1-3. Resources that may be affected are further described and analyzed in the EA. Table 3.1-3 provides rationale for the resources that would not be affected by the Proposed Action or No Action Alternative.

Table 3.1-3 Other Resources or Uses Considered for Analysis

Other Resources	Not Present	Present, Not Affected	Present, May Be Affected	Rationale/Reference Section
Climate Change			X	Section 3.10
Inventoried Roadless Areas			X	Section 3.11
Land Use and Access		X		Resource not affected.
Minerals		X		Resource not affected.
National Historic Trails			X	Section 3.12
Rangeland Resources and Livestock Grazing			X	Section 3.13
Recreation			X	Section 3.14
Soils and Hydrology			X	Section 3.15
Special Status and Candidate Species			X	Section 3.16
Vegetation Resources			X	Section 3.17
Visual Resources			X	Section 3.18
Wild Horses			X	Section 3.19
Wildlife			X	Section 3.20

3.2 AIR QUALITY

3.2.1 Affected Environment

The analysis area for impacts to air quality consists of the HUC 8 watersheds including South Fork Humboldt (HUC 16040103) and Long-Ruby Valleys (HUC 16060007), which encompass approximately 3,466,694 acres. This area was chosen because the Project Area overlaps with the watersheds and the area represents an ecologically connected area with clear topographical

boundaries against which to measure impacts to air quality and visibility from the Proposed Action.

The Clean Air Act (CAA) established National Ambient Air Quality Standards (NAAQS) for seven criteria pollutants: carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter 10 microns in diameter or less, particulate matter 2.5 microns in diameter or less, and sulfur dioxide.

The Environmental Protection Agency (EPA) developed a classification system for distinct air pollution control regions pursuant to the CAA. In Nevada, the regions are based on geographical boundaries and hydrographic basins. Each region has been classified as Attainment, Non-Attainment, or Maintenance for each of the criteria air pollutants. Regions classified as Attainment are areas in which a pollutant has either not exceeded the NAAQS or there has not been sufficient ambient monitoring data to further classify the region. A Non-Attainment classification represents an area in which a pollutant has exceeded the NAAQS. The Maintenance designation is used for areas in which a pollutant has exceeded the NAAQS, but has since been reduced to attainment levels.

White Pine and Elko counties (including the Project Area) are classified as Attainment or unclassified for all criteria pollutants (NDEP, 2011). No data are available regarding emissions and concentrations of criteria pollutants within the analysis area specifically.

3.2.2 Direct and Indirect Effects of Proposed Action

The Proposed Action would create surface disturbance on approximately 13,000 to 14,900 acres. This surface disturbance and workers traveling along existing, unpaved roads would create temporary fugitive dust. Revegetation and stabilization of treatment areas would reduce these impacts to negligible and temporary. The spring restoration would have no impacts to air quality.

There would also be a temporary increase in engine exhaust emissions from equipment used to conduct the treatments and to get work crews to the site. These additional emissions would have no measurable impact to air quality, and would be negligible.

Some proposed treatments call for prescribed burning. Smoke from any prescribed burning would result in a temporary impact to air quality. A smoke variance permit would be required from NDEP prior to prescribed fire implementation. Smoke management measures would be specified in the burn plan. There would be temporary (24 to 36 hours) degradation to air quality while burning operations take place, but because of the remote location of the Project Area, impacts to the public would be negligible.

Impacts to air quality from fugitive dust, vehicle emissions, and prescribed fire would be transitory in nature and would remain below the NDEP Bureau of Air Quality Planning emission standards. All national and state air quality standards would be met during Project implementation. The Proposed Action would not exceed the NAAQS for any criteria pollutants. Impacts to air quality as a result of the Proposed Action would be temporary and negligible.

3.2.3 Direct and Indirect Effects of No Action Alternative

The No Action Alternative would have the potential for temporary minor impacts to air quality from pollutants produced during large, catastrophic wildfire. The potential for wildfire increases as the fuel loads (i.e., pinyon and juniper trees) increase within the Project Area.

3.3 CULTURAL RESOURCES

3.3.1 Affected Environment

The analysis area for impacts to cultural resources includes the public land located within the Project Area. This area represents the area of potential effects for purposes of review under Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA). The NHPA sets forth procedures for considering effects to historic properties and supports and encourages the preservation of prehistoric and historic resources. It directs federal agencies to consider the impacts of their actions on historic properties.

Cultural resources and traditional cultural properties (TCP) are protected under the NHPA, the Archaeological Resources Protection Act of 1979, the American Indian Religious Freedom Act of 1978, and the Native American Graves Protection and Repatriation Act of 1990. A TCP is a property associated with cultural practices or beliefs of a living community that are rooted in that community's history, and are important in maintaining the continuing cultural identity of the community (Parker and King, 1998). This property type may be determined eligible for the NRHP if it meets criteria found in 36 CFR 60.4 and NRHP Bulletin Number 38 (Parker and King, 1998).

Surveys for cultural resources and TCPs in the Project Area would be completed prior to initiation of vegetation treatments.

3.3.2 Direct and Indirect Effects of Proposed Action

Surveys for cultural resources and TCPs would occur prior to implementation of the Proposed Action. The USFS, BLM, and the Nevada SHPO have completed a Draft Programmatic Agreement to avoid impacts to cultural resources and TCPs within the Project Area (Appendix C). Measures included in the programmatic agreement would be incorporated into all treatments proposed for this Project.

With the implementation of treatment design features described in Section 2.3.3.4, the Proposed Action, including the spring restoration, would result in negligible impacts to cultural resources and TCPs.

3.3.3 Direct and Indirect Effects of No Action Alternative

The No Action Alternative would have potential minor impacts to cultural resources and TCPs, because a Class III cultural survey would not be conducted and wildfire could damage present resources. Without a Class III cultural survey, proactive management for the protection of TCPs and cultural resources would not occur in the event of wildfire.

3.4 HUMAN HEALTH AND SAFETY (HERBICIDE PROJECTS)

3.4.1 Affected Environment

Human health and safety was evaluated in the *Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States Programmatic Environmental Impact Statement* (BLM, 2007b). There are no known existing human health and safety concerns or issues in the Project Area related to herbicides.

3.4.2 Direct and Indirect Effects of Proposed Action

The Cracker Johnson Spring No. 2 restoration would have herbicide application as a treatment method for non-native, invasive and noxious species. Direct impacts to a person coming into contact with Project-related herbicides may include skin irritation, chemical burns, and eye irritation or damage. Direct impacts could also occur from drift or accidental spraying; however, this impact is unlikely due to the application methods proposed. Indirect impacts could occur if a person ingests a plant, seed, or berry that has been sprayed with the herbicide. Stipulations in the Weed Risk Assessment (Appendix E) would require that areas treated with herbicides be adequately posted to notify the public of the activity and of safe re-entry dates, if a public notification requirement is specified on the label of the herbicide. Given the remote nature of the Project, requirements for notification of application, and that herbicide would be targeted to non-native, invasive and noxious species, direct and indirect impacts would be unlikely.

3.4.3 Direct and Indirect Effects of No Action Alternative

Under the No Action Alternative, no herbicide applications would occur. Therefore, no direct or indirect effects on human health and safety would result from this alternative.

3.5 MIGRATORY BIRDS

3.5.1 Affected Environment

Migratory birds are those listed in 50 CFR 10.13 and include all native birds commonly found in the United States, with the exception of native resident game birds. Migratory birds are protected under the Migratory Bird Treaty Act (MBTA) (16 United States Code 701-718h),

which prohibits the taking of migratory birds, their parts, nests, eggs, and nestlings without a permit. Federal agencies are directed to protect migratory birds by integrating bird conservation principles, measures, and practices under Executive Order 13186, signed January 10, 2001.

Additional direction comes from the Memorandum of Understanding (MOU) between the USFS and the United States Fish and Wildlife Service (USFWS) that was signed in 2008. The purpose of the MOU is to conserve and reduce take of migratory birds. A similar MOU between the BLM and the USFWS was signed April 12, 2010. This MOU has management objectives and recommendations to avoid or minimize potential impacts to high priority migratory bird species. The purpose of the MOU is to strengthen migratory bird conservation through enhanced collaboration between the BLM and USFWS in coordination with state, tribal, and local governments.

Migratory birds include those species of birds that breed and nest in the Project Area and then migrate south prior to the onset of winter. A variety of other migratory bird species may also pass through the Project Area during migration. Migratory songbirds are found in virtually every habitat in the Great Basin, and usually half or more of the breeding birds in any sampled area are migratory (Robinson, 1997). In general, avian diversity is lowest in Great Basin cold desert habitats during the winter season. Diversity increases as migrant species arrive to nest in the area with the onset of spring. Different times of year would yield different amounts and species of migratory birds.

The diversity of migratory birds that could be found in the Project Area is large. Some species may breed and nest in the Project Area prior to migration, and a variety of others may pass through the area during migration. Table 3.5-1 contains a list of migratory bird species that have the potential to occur in the Project Area that are also on either the BLM or USFS Sensitive Species lists. It is assumed that any of these species could be used as an indicator species for the majority of migratory birds that occur within the Project Area. Further detailed analysis on migratory birds can be found in the *Specialist Report and Biological Evaluation, Wildlife, Overland Pass Habitat Improvement Project* (JBR, 2014f).

Table 3.5-1 Priority Migratory Bird Species and Habitats

Species	Scientific Name	Nesting Habitat	Foraging Habitat
Brewer's sparrow	<i>Spizella breweri</i>	Sagebrush	Sagebrush
Western burrowing owl	<i>Athene cunicularia hypugea</i>	Sagebrush, grassland	Sagebrush, grassland
Loggerhead shrike	<i>Lanius ludovicianus</i>	Sagebrush	Sagebrush
Sage sparrow	<i>Amphispiza belli</i>	Sagebrush	Sagebrush
Gray flycatcher	<i>Empidonax wrightii</i>	Pinyon and Juniper	Pinyon and Juniper
Pinyon jay	<i>Gymnorhinus cyanocephalus</i>	Pinyon and Juniper	Pinyon and Juniper

Species	Scientific Name	Nesting Habitat	Foraging Habitat
Black rosy finch	<i>Leucosticte atrata</i>	Mountain Brush	Mountain Brush
Sage thrasher	<i>Oreoscoptes montanus</i>	Sagebrush	Sagebrush

3.5.2 Direct and Indirect Effects of Proposed Action

Direct effects which could occur to migratory birds are associated with direct mortality of birds from mechanical and prescribed fire treatments. Mortality is unlikely due to treatment design features described in Section 2.3.3 and the mobility of bird species. Direct effects to migratory birds would also include temporary displacement from the treatment areas, including Cracker Johnson Spring No. 2, during Project implementation. Displaced birds would likely reestablish once treatment activities are completed. Thus, the impact to migratory birds would be temporary and negligible.

Long-term indirect effects would occur from a loss of pinyon-juniper habitat for species such as pinyon jay or other pinyon-juniper dependent species. However, abundant pinyon-juniper habitat would remain both within the Project Area and in the surrounding area. Thus, the long-term impacts to migratory bird species dependent on pinyon-juniper habitat would be minor. Sagebrush-obligate species such as sage sparrow and Brewer's sparrow would see a long-term increase in habitat quantity and quality. The Project would contribute to long-term stable trends for sagebrush-obligate migratory birds in the Project Area.

Short- and long-term effects to migratory birds from implementation of the Proposed Action would be expected to be negligible to minor. Impacts associated with the Project would not result in reducing population viability, existing distribution, or result in a downward trend in habitat capability. Additionally, the Proposed Action would be in compliance with the MBTA, as no take of migratory birds, nests, eggs, or nestlings would be anticipated.

3.5.3 Direct and Indirect Effects of No Action Alternative

Under the No Action Alternative some minor, long-term indirect effects would occur because sagebrush habitat would continue to be replaced with pinyon-juniper habitat. Species dependent on pinyon-juniper habitat may become more common as sagebrush is replaced. However, sagebrush-obligate species would be expected to become less common.

3.6 NATIVE AMERICAN RELIGIOUS CONCERNS

3.6.1 Affected Environment

Federal agencies are required to consult with Native Americans on actions that may affect their traditions or uses of public lands. The agency must provide tribes a reasonable opportunity to identify its concerns about historic properties, advise on the identification and evaluation of

historic properties, including those of traditional religious and cultural importance, articulate its views on the undertaking's effects on such properties, and participate in the resolution of effects.

The BLM and USFS have consulted with federally-recognized Indian tribes that have a cultural affiliation based on traditional use, ancestral ties, and/or oral histories associated with the Project Area. These tribes include:

- Battle Mountain Band Council;
- Confederated Tribes of the Goshute Reservation;
- Duckwater Shoshone Tribe;
- Elko Band Council;
- Ely Shoshone Tribe;
- Moapa Band of Paiutes;
- Paiute Indian Tribe of Utah;
- Skull Valley Band of Goshute Indians;
- South Fork Band Council;
- Te-Moak Tribe of the Western Shoshone Indians of Nevada;
- Wells Band Council; and
- Yomba Shoshone Tribe.

Tribal consultation indicated the need to minimize impacts to the Fort Ruby site, and for Tribal participation during any cultural inventory process. The Fort Ruby site is located adjacent to, but outside of the Project Area.

3.6.2 Direct and Indirect Effects of Proposed Action

Treatment design features have been incorporated into the Proposed Action to minimize impacts to visual resources seen from the Fort Ruby site. The Programmatic Agreement (Appendix C) includes additional measures to protect Native American religious concerns. Therefore, the Proposed Action, including the spring restoration, is anticipated to have negligible impacts on Native American religious concerns.

3.6.3 Direct and Indirect Effects of No Action Alternative

Under the No Action Alternative, there would be no impacts to Native American religious concerns.

3.7 NON-NATIVE, INVASIVE AND NOXIOUS SPECIES

3.7.1 Affected Environment

The Nevada Revised Statutes defines a noxious weed as "any species of plant which is, or likely to be, detrimental or destructive and difficult to control or eradicate." The BLM defines a

noxious weed as "a plant that interferes with management objectives for a given area of land at a given point in time." Noxious weeds are defined by the USFS in Forest Service Manual 2080.5 as "those plant species designated as noxious weeds by the Secretary of Agriculture or by the responsible State official. Noxious weeds generally possess one or more of the following characteristics: aggressive and difficult to manage" (USFS, 2011b). The State of Nevada maintains a noxious weed list. The USFS incorporates the state list as it applies to NFS land. For the purposes of the analysis, any species that is designated and published as a noxious weed on the Nevada state list was considered to be a noxious weed species.

Executive Order 13112 defines an invasive species as an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health. The BLM defines an invasive weed as a "non-native plant that disrupts or has the potential to disrupt or alter the natural ecosystem function, composition, and diversity of the site it occupies."

The USFS and BLM provided Geographic Information Systems (GIS) shapefiles of mapped weed occurrences within the Project Area (BLM, 2012d; USFS, 2012a). NDOW also collected vegetation data in the Project Area in 2011. From these sources, several species of noxious and invasive species have been identified within the Project Area, which are listed in Table 3.7-1. Further detailed analysis of non-native, invasive and noxious species is available in the *Specialist Report, Vegetation Resources and Noxious and Invasive Weeds, Overland Pass Habitat Improvement Project* (JBR, 2014d).

Table 3.7-1 Non-Native, Invasive and Noxious Species Identified Within the Project Area

Common Name	Scientific Name	Present Within Treatment Unit(s) (Yes/No)
Black henbane	<i>Hyoscyamus niger</i>	No
Bull thistle	<i>Cirsium vulgare</i>	No
Canada thistle	<i>Cirsium arvense</i>	No
Cheatgrass	<i>Bromus tectorum</i>	Yes
Halogeton	<i>Halogeton glomeratus</i>	Possible
Leafy spurge	<i>Euphorbia esula</i>	Yes
Musk thistle/nodding plumeless thistle	<i>Carduus nutans</i>	Yes
Poison hemlock	<i>Conium maculatum</i>	No
Russian knapweed/hardheads	<i>Acroptilon repens</i>	Yes
Russian thistle	<i>Salsola</i> sp.	Possible
Scotch thistle/Scotch cottonthistle	<i>Onopordum acanthium</i>	Yes
Spotted knapweed	<i>Centaurea stoebe</i>	Yes
Whitetop/hoary cress	<i>Cardaria draba</i>	No

Source: (BLM, 2012d; ENLC, 2012; NDOW, 2011; USFS, 2012a)

3.7.2 Direct and Indirect Effects of Proposed Action

The risk for the spread and establishment of non-native, invasive and noxious species would primarily result from the disturbance to soil and native vegetation cover during implementation of the treatments. Non-native, invasive and noxious species may also be spread or establish from the use of Project equipment in the area. Hand thinning, greenwood/fuelwood harvest, and seeding treatments would typically result in less disturbance and require less equipment than the other treatments, and would generally have less risk for spreading or establishing non-native, invasive and noxious species. Chaining, mastication and prescribed burn treatments would typically have a greater risk due to the increased ground disturbance, removal of existing vegetation, and equipment associated with their implementation. Additionally, cheatgrass could easily invade the burned and mechanically treated areas, particularly in areas that have a limited shrub and herbaceous understory and seed bank.

A Weed Risk Assessment was completed for the Project and is included as Appendix E. According to the assessment, the Project has a risk rating of moderate when all treatments are considered collectively. The rating accounts for the likelihood for weeds to spread throughout the Project Area and the consequences of weed establishment within the Project Area. Invasive species suppression (Section 2.3.1.8) could also be used to limit establishment of non-native invasive and weed species.

Stipulations in the Weed Risk Assessment would require that all equipment and vehicles used for treatment application, monitoring, and inspection be cleaned and washed prior to entering and leaving the Project Area to reduce the spread of weeds. Stipulations would require that treatment areas be monitored for noxious weeds through the life of the Project. If the presence or spread of noxious weeds is noted during monitoring, appropriate weed control procedures, as determined in consultation with BLM or USFS, would be implemented. With reclamation of Project disturbance and compliance with the stipulations of the Weed Risk Assessment, the Proposed Action, including the spring restoration, would be anticipated to have negligible short-term impacts and no long-term impacts from the spread or establishment of non-native, invasive and noxious species.

3.7.3 Direct and Indirect Effects of No Action Alternative

The No Action Alternative would not result in the surface disturbance or use of equipment that would be required from implementation of the Proposed Action. Existing vegetation cover within the Project Area would not be removed or disturbed, and conditions favorable for the establishment of non-native, invasive and noxious species would not be created. Noxious weeds would be treated under the Ely District Integrated Weed Management Plan, according to the District weed treatment schedule. However, existing populations of non-native, invasive species would continue to spread throughout the Project Area at their natural rates. The No Action

Alternative would have minor, long-term effects from the spread of non-native, invasive and noxious species within the Project Area.

3.8 WATER QUALITY

3.8.1 Affected Environment

Eleven spring sites, as classified by the National Hydrography Dataset (NHD) (USGS, 2014), were identified within the Project Area. One additional spring, identified from the NDOW spring GIS data, is located in the Project Area (NDOW, 2014), for a total of 12 documented spring sites (Figure 3.8-1). Six spring sites identified in the NHD or NDOW databases are named, including: Tub Spring, Walker Spring, Pete Holm Spring, Cracker Johnson Spring No. 1, Cracker Johnson Spring No. 2, and Flyn and Hager Spring. Cracker Johnson Spring No. 1 is located within the Cracker Johnson treatment unit; however, no other known spring sites located within the Project Area are within the treatment units.

Water quality in the Project Area is protected under Section 303 of the Clean Water Act and 40 CFR Part 131 where applicable, and state water standards. All surface water located in or crossing through the Project Area are within water quality standards and beneficial use outlined within Nevada Administrative Code (NAC) 445A-120-23, including Standards Applicable to All Surface Waters (NAC, 1999), Standards Applicable to Beneficial Uses (NAC, 1995), and Classification and Reclassification of Waters (NAC, 2008). No water located within the Project Area is classified as “impaired” by NDEP or the EPA.

More detailed analysis information can be found in the *Specialist Report, Hydrology and Soils, Overland Pass Habitat Improvement Project* (JBR, 2014a).

3.8.2 Direct and Indirect Effects of Proposed Action

Under the Proposed Action, negligible, temporary impacts to water quality at the watershed scale (HUC 12) would be anticipated. These impacts may include increased sediment load in runoff from treatment areas due to removal of vegetation cover. Although, with the exception of Willow Creek, all drainages identified within the Project Area are classified by NHD as intermittent (i.e., flowing part of the year, every year), thereby decreasing potential for sediment deposit or influence on water quality. However, reconnaissance by USFS personnel indicate that many of the drainages within the Project Area are ephemeral (i.e., flowing only briefly during and following a precipitation event) (Hurja et al., 2010), further reducing the potential for sediment deposit or influence on water quality. Additionally, spreading treatments over a 10-year time frame would reduce the area at risk of increased runoff and erosion in any given year. Should any additional seeps or springs be identified during Project activities, they would be documented and avoided. Avoiding disturbance to seeps and springs would reduce potential impacts to water quality from increased sedimentation and runoff.

Minor, temporary direct impacts to water quality would be anticipated from the Cracker Johnson Spring No. 2 restoration implementation. Direct impacts include increased sedimentation during erosion control structure installation and temporary addition of chemicals during herbicide application. However, only herbicides approved for use in/near aquatic systems would be used, in accordance with manufacturer specifications, and meeting all state and agency approval requirements. In the long-term, the restoration activities would improve water quality by reducing sediment input to the channel and spring. Long-term, indirect effects from the spring restoration include reduced soil compaction, reduced sediment loading to the channel and spring, and improved water quality due to exclusion of ungulates and establishment of perennial species. Additionally, placement of a water trough outside of the fenced area would reduce organic pollutant input to the spring source.

3.8.3 Direct and Indirect Effects of No Action Alternative

Under the No Action Alternative, no impacts to water quality would be anticipated. Because water quality standards are currently being met within the Project Area there is no indication that continued management would cause a decline in water quality. White top would potentially increase within the associated riparian area and compete with desired vegetation.

3.9 WETLANDS AND RIPARIAN ZONES

3.9.1 Affected Environment

According to the NHD (USGS, 2014) and the National Wetlands Inventory (NWI) dataset (USFWS, 2014a), no wetlands or riparian zones occur within the Project Area. However, there is potential for undocumented wetlands or riparian zones to occur in association with any of the spring sites that occur within the Project Area (e.g., Cracker Johnson Spring No. 2). Further detailed analysis information can be found in the *Specialist Report, Hydrology and Soils, Overland Pass Habitat Improvement Project* (JBR, 2014a).

3.9.2 Direct and Indirect Effects of Proposed Action

Design features and Best Management Practices (BMPs) dictate that wetlands and riparian areas would be avoided in treatment units, with the exception of the Cracker Johnson Spring No. 2 restoration. Therefore, direct effects of the Proposed Action on riparian areas that may be associated with spring sites within the Project Area would be negligible. Negligible, short-term indirect effects from the Proposed Action may include increased water availability for riparian vegetation after removal of trees.

Direct impacts from the Cracker Johnson Spring No. 2 restoration would be negligible and short-term and would include trampling of riparian vegetation during fence installation and erosion control structures, as well as a reduction of noxious weeds from herbicide application.

Negligible, long-term indirect effects from the spring restoration would include reduced soil compaction and increased cover and density of riparian vegetation.

3.9.3 Direct and Indirect Effects of No Action Alternative

No direct effects to wetlands and riparian areas would be anticipated from the No Action Alternative. However, indirect effects would be likely to include continued establishment of upland and forest vegetation species into riparian areas, if any, and expansion into areas historically absent of such species. This establishment would be likely to result in decreased water availability for riparian vegetation from altered water up-take and nutrient cycling around riparian areas, if present.

3.10 CLIMATE CHANGE

3.10.1 Affected Environment

According to the BLM's Instruction Memorandum No. 2008-171 "Guidance on Incorporating Climate Change into Planning and NEPA Documents" dated August 19, 2008, climate change considerations should be acknowledged in EA documents. The Instruction Memorandum states that ongoing scientific research indicates that anthropogenic greenhouse gas (GHG) emissions and changes in biological carbon sequestration due to land management activities potentially impact global climate. Through complex interactions on a global scale, GHG emissions and net losses of biological carbon sinks lead to a net warming of the atmosphere. GHGs have been found to be capable of trapping heat in the atmosphere by decreasing the amount of heat radiated by the Earth out to space.

The GHG emissions are comprised of many separate chemicals, the most notable is carbon dioxide (CO₂) from fossil fuel development, large wildland fires, and activities using combustion engines. The leading causes of GHG emissions in 2005 for Nevada were attributed to electrical generation (approximately 48 percent) and transportation (approximately 30 percent). Nevada data, measured since 2005, indicated CO₂ to represent approximately 91 percent of GHG emissions (NDEP, 2008).

Emissions of GHGs within the vicinity of the Project Area are primarily from vehicle combustion emissions, but increased emissions also occur periodically from wildland fire. Emissions of GHGs are generally expected to be low due to the seclusion and extremely limited number of sources located in the vicinity of the Project Area.

3.10.2 Direct and Indirect Effects of Proposed Action

The Project would result in the emission of a small amount of GHGs as a result of vegetation burning, vehicle emissions, and decay of treated vegetation. Emissions associated with the Proposed Action would be a very small portion of the global budget of constituents affecting

global climate change. Additionally, the Proposed Action, including the spring restoration, would result in sequestration of carbon as a result of improved vegetative productivity and improved soil quality in the long-term. Thus, the Proposed Action would not be anticipated to have any measurable impacts to climate change.

3.10.3 Direct and Indirect Effects of No Action Alternative

The No Action Alternative would have potential temporary minor impacts to climate change, through the burning of fuels during catastrophic wildfire. As fuel loads increase throughout the project area due to pinyon and juniper tree establishment, the potential for large catastrophic wildfire increases, which would result in the release of GHGs during a fire.

3.11 INVENTORIED ROADLESS AREAS

3.11.1 Affected Environment

There is one Inventoried Roadless Area (IRA) overlapping the Project Area: Pearl Peak Roadless Area. The Pearl Peak Roadless Area consists of 71,372 acres, with 11,958 acres overlapping the Project Area, and 3,235 acres occurring within treatment units. The 2001 Roadless Rule establishes prohibitions on road construction and reconstruction, and timber harvesting on IRAs on NFS lands. The Project Area was evaluated to determine impacts to roadless characteristics, which include:

- High quality or undisturbed soil and water;
- Sources of public drinking water;
- Diversity of plant and animal communities;
- Habitat for threatened and endangered or sensitive species;
- Primitive, semi-primitive non-motorized, and semi-primitive motorized classes of dispersed recreation;
- Reference landscapes for research study;
- Natural appearing landscapes with high scenic quality;
- TCPs and sacred sites; and
- Locally unique characteristics.

3.11.2 Direct and Indirect Effects of Proposed Action

No long-term impacts would be anticipated to IRAs. Temporary, negligible impacts to roadless characteristics may occur during treatment implementation; however, less than five percent of the Pearl Peak Roadless Area would be affected by treatments. Temporary disturbance to soil, water, and air resources would occur during treatment application, including spring restoration, depending on treatment method. There are no sources of public drinking water within the Project Area. The Proposed Action would not decrease vegetation and animal community diversity, although local populations could vary in response to treatment (Sections 3.17 and

3.20). Threatened and endangered species would be avoided during treatment application, and the Proposed Action would likely improve habitat (Section 3.16). Impacts to recreation are discussed in detail in Section 3.14.2. No reference landscapes occur within the Project Area. Scenic integrity is discussed in detail in Section 3.18.2. Any identified TCPs would be avoided during treatment application. Locally unique characteristics include the Pony Express Trail (Section 3.12), Ruby Lake National Wildlife Refuge, and Fort Ruby (Section 3.14). Impacts to the wildlife refuge would be negligible because it is located outside the Project Area. Additionally, no new roads would be constructed during Project implementation and any two-track roads or skid trails created during treatment application would be decommissioned and rehabilitated following treatment. More detailed analysis information can be found in the USFS IRA worksheets available in the Administrative Record. Design features (Section 2.3.2) would minimize impacts to existing roads and treatment areas. Additionally, the Proposed Action would result in diverse plant communities, which meets the goals of IRAs. Therefore, impacts anticipated to IRAs from the Proposed Action would be negligible.

3.11.3 Direct and Indirect Effects of No Action Alternative

Under the No Action Alternative there would be no impacts to IRAs. The No Action Alternative involves no treatments or management actions which would impact IRAs.

3.12 NATIONAL HISTORIC TRAILS

3.12.1 Affected Environment

As described in BLM Manual 6280 (BLM, 2012c), NHTs are managed to recognize the nationally significant resources, qualities, values, and associated settings of the areas through which such trails may pass, including the primary use or uses of the trail. Properties eligible for the NRHP may be identified along the NHT, including segments of the NHT.

Two NHTs cross through the Project Area: the Hastings Cutoff of the California Trail and the Pony Express Trail. On the east side of the Project Area, the Hastings Cutoff follows Ruby Valley Road and eventually turns west and follows Overland Pass over the Ruby Mountains. After exiting Overland Pass, the Hastings Cutoff turns northwest and continues out of the Project Area. The Pony Express Trail enters the east side of the Project Area from the southeast and eventually follows Overland Pass and the Hastings Cutoff. After exiting Overland Pass, the Pony Express Trail turns southwest and continues out of the Project Area.

The BLM VRM System was used to analyze the potential visual impacts of the proposed Project on the historic integrity and character of the NHTs. BLM VRM classes provide objectives that identify various permissible levels of landscape alteration while protecting the overall visual quality of the region. The VRM classes that have been designated for the BLM-administered public land within the Project Area include Class II, Class III, and Class IV. Three Key

Observation Points (KOPs) were selected for the visual analysis: Cultural KOP 1, Cultural KOP 2, and Traveling Cultural KOP (Figure 3.12-1). Refer to Section 3.18 for a detailed description of VRM classes and each KOP. Photos from each KOP are presented in Appendix G.

Cultural KOP 1

Cultural KOP 1 is located where the Pony Express Trail and Hastings Cutoff of the California Trail meet on the east side of Overland Pass. This KOP is located within BLM VRM Class II, and VRM Class II and Class III are visible to the north and south. BLM VRM Class II is also visible to the east and west. NFS lands designated as Moderate SIO are visible to the west and northwest. There is a sign at the KOP that states that this is the Pony Express Trail and that it lasted from 1860 to 1861. The sign directs viewer attention toward the south.

The view from Cultural KOP 1 is of an open, panoramic landscape that is typical of the Great Basin and is representative of basin and range topography. Sign of human impacts are limited to the road surface of Overland Pass. In all directions, views of the foreground and middleground are dominated by nearly flat valley floors. Vertical relief is restricted to steep mountains in the background. Simple horizontal lines make up the flat and gently rolling foreground and middleground. Bold diagonal lines with pyramidal shapes are found in the background in association with vertical relief of the steep mountains. Landform colors in the background consist of dull, low-chroma shades of gray with seasonal white-dotted snow-covered mountains. Landform colors in the foreground and middleground are shades of tan and gray, and the texture is smooth to medium. The texture of the landforms in the background is generally indistinguishable.

Vegetation cover in the foreground is predominately sagebrush and shrubs. Sagebrush and shrubs are globular in form whereas the small amounts of visible grasses appear spiked. The middleground contains the same vegetative species as the foreground, but pinyon and juniper trees are also present. To the west, northwest, and north, pinyon and juniper trees adjacent to the roadway obstruct views of the middleground. In all directions, weak irregular lines separate the differences in vegetative density and type that exists between the foreground and middleground. There is a bold line in the middleground created where sagebrush and the pinyon-juniper woodland converge. The colors in the foreground and middleground are brown, gray-green, and pale tan with some isolated dark-green hues in the middleground. The texture of the vegetation is coarse in the immediate foreground and medium to smooth in the middleground. Pinyon-juniper woodland vegetation varies from patchy to dense in all directions throughout the background, creating soft irregular lines. Taller trees rising above the horizontal band-shaped form of foliage have a conical or triangular-shaped form. The color of the woodland vegetation is dark green, very dark brown and very dark gray.

Structures in the foreground and middleground consist of Overland Pass, an unpaved road. Depending on the contour, the road creates a bold to moderate line that varies from serpentine to straight. The road surface is tan and appears to have a smooth texture. The Pony Express Trail informational sign is visible to the south. There are no other structures visible in the landscape.

Cultural KOP 2

Cultural KOP 2 is located where the Pony Express Trail and Hastings Cutoff of the California Trail meet on the west side of Overland Pass. This KOP is located within and surrounded by BLM VRM Class II. NFS lands designated as Moderate SIO are visible to the north and northeast.

To the north and northeast, the view from Cultural KOP 2 is of an enclosed landscape. To the east, the view is of a focal landscape. Both views are typical of the Great Basin and are representative of basin and range topography with limited sign of human impacts. In all directions, the foreground consists of nearly flat valley floors, with hills dominating the middleground. Views of the background are blocked by topography to the north and northeast. To the west, there are steep pyramidal-shaped mountains. To the north and northwest, the general line in the foreground and middleground is horizontal where the landform meets the skyline. To the east, lines are diagonal, focusing on a single point on the horizon. Throughout, landform colors in the foreground and middleground are shades of tan and gray, and the texture is smooth to medium. The texture of landforms in the background is smooth due to their distance from the KOP.

Vegetation cover type and density is similar in the foreground and middleground. The vegetation includes sagebrush, shrubs, pinyon and juniper trees, and scant grasses. Sagebrush, shrubs, and juniper trees are globular in form whereas grasses appear spiked. Subtle differences in vegetation type and cover in the foreground and middleground are characterized by weak, irregular lines. The colors in the foreground and middleground display gray-green and dark green hues. The texture of the vegetation is slightly coarse to medium in the foreground and middleground.

Structures in the foreground consist of the Overland Pass road. Depending on the contour, the road creates a bold to moderate line that varies from serpentine to straight. The unpaved surface of the road is tan and appears to have a smooth texture. There are no other structures visible in the landscape.

Traveling Cultural KOP

Traveling Cultural KOP captures views traveling east and west along the Pony Express Trail and Hastings Cutoff of the California Trail through Overland Pass. This KOP is an approximately

7.8-mile stretch of Overland Pass, which begins and ends at junction points of the Hastings Cutoff of the California Trail and Pony Express Trail to the east and to the west of the Ruby Mountains. This KOP crosses BLM-administered public lands designated as VRM Class II and NFS lands designated as Moderate SIO. BLM Class III and Class IV are visible to the south.

The view from Traveling Cultural KOP consists of enclosed, focal, and panoramic landscapes that are typical of the Great Basin landscape and basin and range topography. Aside from the road over Overland Pass, there are limited signs of human impacts. Between the west end of the KOP and the summit of Overland Pass, views are enclosed to the north and south, and focused on where the road meets the horizon. Views of the background throughout the landscape are extremely limited due to the topography in relation to the road. From the summit to the eastern end of the KOP, the landscape opens up to panoramic views toward the north and south, but views are focused on the road. Irregular, diagonal lines make up the landforms. Weak lines are formed in the lower valleys and silhouetted ridgelines are present in the panoramic views. Dominant colors include dull tans and light browns where exposed soils are visible.

Vegetation throughout the foreground and middleground is characterized by alternating dense clumps of pinyon-juniper woodland with occasional blanketed strips of sagebrush along the road. The dense woodland areas create a solid, horizontal band-shaped form above the surface of the ground. Taller trees rising above the horizontal band-shaped form of foliage have a conical or triangular-shaped form. Individual trees create vertical lines. Strong and irregular lines are created from changes in tree density and occurrence of sagebrush. Vegetation throughout the panoramic landscape consists of low sparse grasses and sagebrush in the foreground and middleground. The vegetation appears globular or spiked. Scattered stands of pinyon-juniper woodland create weak and less prominent lines into the background. The color of the woodland vegetation is vivid dark green. The sagebrush and other shrub components are seasonally characterized by gray-green, light green and yellow hues. Scant perennial grasses throughout the foreground and middleground add seasonal faint golden and light green hues. The irregular heights of trees in the pinyon-juniper woodland display a coarse texture while the sagebrush and shrub component appear to have a smooth and carpeted texture.

Structures throughout the entire KOP are limited to the road which the KOP traverses. The road is flat to slightly diagonal as elevation increases and ranges from serpentine to straight. Lines formed from the edges of the road vary from strong to weak depending on the contour of the road. The dirt road is light brown in color and smooth in texture.

3.12.2 Direct and Indirect Effects of Proposed Action

Cracker Johnson Spring No. 2 is not visible from any KOP location, therefore restoration activities would not be anticipated to have any impacts on the NHTs in the Project Area.

3.12.2.1 Cultural KOP 1

The treatment units that would be visible from Cultural KOP 1 include the East Bench, Lower East Bench, and Overland Pass units. All three treatment units would occur in the foreground, middleground, and background of the landscape visible from Cultural KOP 1.

The visual contrast created by the proposed treatments within the East Bench and Lower East Bench treatment units would be the same as described for KOP 1 and KOP 2 in Section 3.18.2. Because the Overland Pass treatment unit would be located roughly the same distance from Cultural KOP 1 as the East Bench treatment unit would be from KOP 1 and KOP 2, and because this analysis assumes any and all of the treatments may occur within each unit, the visual contrast within the Overland Pass unit would be the same as described for the East Bench unit from KOP 1 and KOP 2. Accordingly, implementation of the Proposed Action does not conflict with the objectives of BLM VRM Class II or Class III or the objectives and landscape characteristics of USFS Moderate SIO.

While the Project would remove existing woodland cover from the existing visual setting of the NHTs from Cultural KOP 1, native sagebrush and herbaceous species would colonize and appear natural. Changes to the scenic quality of the existing visual setting of the NHTs would not conflict with the intended purpose(s) or use(s) of either NHT in the Project Area. Impacts to the scenic and visual integrity of NHTs would be negligible to minor and short-term. Minor impacts would dissipate to negligible over time, as sagebrush establishes within the treatment units.

Cultural surveys have not been conducted for the Project Area, but would be conducted prior to any treatment application. Cultural sites and TCPs would be avoided during treatment application; therefore, no impacts to the cultural integrity of the NHTs would be anticipated.

3.12.2.2 Cultural KOP 2

The Big Wash treatment unit would be visible from Cultural KOP 2. This treatment unit is the same treatment unit that would be visible from KOP 4, and from roughly the same angle of view. Thus, the visual contrast described for the proposed Project at KOP 4 (Section 3.18.2) would also be anticipated at Cultural KOP 2. However, Cultural KOP 2 would be approximately 1.2 miles closer to the treatment unit, meaning some treatment activities would occur in the foreground. Visual contrast would be minimal, despite the closer proximity, because the proposed Project would repeat elements that are characteristic of the existing landscape. The proposed Project would not dominate the landscape and the level of change to the landscape would be low. Most contrast from the Project would be short-term and dissipate within several years following the treatments. The Proposed Action would not conflict with VRM Class II or Moderate SIO.

While the Project would remove existing woodland cover from the existing visual setting of the NHTs from Cultural KOP 2, native sagebrush and herbaceous species would colonize afterwards and appear natural. Changes to the scenic quality of the existing visual setting of the NHTs would be not conflict with the intended purpose(s) or use(s) of either NHT in the Project Area. Impacts to the scenic and visual integrity of NHTs would be negligible to minor and short-term. Minor impacts would dissipate to negligible over time, as sagebrush establishes within the treatment units.

3.12.2.3 Traveling Cultural KOP

Treatment units that would be visible from Traveling Cultural KOP include the Lower East Bench, East Bench, Cracker Johnson, Big Wash, and Overland Pass units. The removal of pinyon and juniper trees within all of the treatment units would create additional breaks between woodland communities and shrub communities. Roughly horizontal lines would be created where these communities converge. The vertical lines would appear soft and faint because they would mimic similar vertical lines from natural vegetation breaks in the existing landscape. Vertical lines associated with the trunks of individual trees would be slightly more discernible after treatments because of the reduced tree density. The reduced tree density would also allow for more visibility of mineral soils and rock outcroppings, which would add tan and gray colors to the landscape. Felled trees left within the treatment units would increase the occurrence of irregular horizontal to near-horizontal lines. Biomass material would add brown and tan colors as it decomposes. Dark green colors associated with pinyon-juniper woodland would be reduced within the treatment area. However, as sagebrush becomes established, gray-green colors would be added to the landscape.

The Proposed Action would have weak visual contrast with the existing landscape because the form, line, color, and texture elements associated with the proposed treatments would generally be repetitive of elements typical of the existing landscape features. Because native vegetation species would establish within areas where woodland is removed from treatment units, visual modifications would not dominate the landscape character, and the level of change would be low. Thus, implementation of the Proposed Action would not conflict with the objectives of VRM Class II or the objectives and landscape characteristics of Moderate SIO.

While the Project would remove existing woodland cover from the existing visual setting of the NHTs from Traveling Cultural KOP, native sagebrush and herbaceous species would colonize afterwards and appear natural. Changes to the scenic quality of the existing visual setting of the NHTs would be not conflict with the intended purpose(s) or use(s) of either NHT in the Project Area. Impacts to the scenic and visual integrity of NHTs would be negligible to minor and short-term. Minor impacts would dissipate to negligible over time, as sagebrush establishes within the treatment units.

3.12.2.4 Summary

Overall, impacts to the scenic and visual integrity of NHTs would be negligible to minor and short-term. Minor impacts to visual integrity would dissipate to negligible over time, as sagebrush establishes within the treatment units. Cultural sites and TCPs would be avoided during treatment application; therefore, no impacts to the cultural integrity of the NHTs would be anticipated. Cracker Johnson Spring No. 2 is not visible from the NHTs, therefore impacts from spring restoration would be negligible.

3.12.3 Direct and Indirect Effects of No Action Alternative

Under the No Action Alternative, elements (i.e., form, line, color, and texture) of the existing vegetative character would remain the same as what's described in the existing environment for each KOP. Over time, natural succession would result in continued establishment of pinyon and juniper trees, and the continued decline of herbaceous vegetation in the understory of the trees. Also, pinyon and juniper trees would continue to establish in sagebrush dominated communities and increase in density where already established. The form, line, color, and texture elements associated with pinyon-juniper woodlands would become more prominent in the landscape from all of the KOPs. Considering the pinyon-juniper woodland is a component of the existing landscape from each KOP, and continued establishment of pinyon-juniper is a natural pattern, visual contrast impacts would be negligible in the short-term and the long-term.

3.13 RANGELAND RESOURCES AND LIVESTOCK GRAZING

3.13.1 Affected Environment

The Project Area includes portions of eight grazing allotments. Four allotments are located on BLM land and four allotments are located on NFS land (Figure 3.13-1). No allotments are located in their entirety within the Project Area or treatment units. Table 3.13-1 provides a list of each allotment and the number of permitted active animal unit months (AUM) on each allotment.

Table 3.13-1 Livestock Grazing Allotments

Allotment	Allotment Number	Agency	Permittee	Livestock Type	Livestock Number	Allotment Acres (Public and Private)	Allotment Acres within Project Area	Allotment Acres within Treatment Units
Warm Springs	00606	BLM	Tumbling JR Ranch	Cattle	1,443	362,941	16,338	8,057
Cold Creek	00603	BLM	Tumbling JR Ranch Little Paris Sheep Company	Cattle Sheep	850 170	64,840	3,021	1,082
Warm Springs Trail	00622	BLM	Tumbling JR Ranch Little Paris Sheep Company	Sheep	9,300 2,080	66,289	370	0
Mitchell Creek	05440	BLM	Little Paris Sheep Company Pete and Julian Goicoechea	Sheep Cattle	176 166	18,894	2	<1
Cave Creek C&H	00203	USFS	Duval Ranching Company	Cattle	210	24,613	8,304	1,735
Cherry Spring C&H	00204	USFS	Harold Rother Farms, Inc. Tumbling JR Ranch	Cattle	75 65	7,048	5,281	1,877
Sherman Creek C&H	00224	USFS	Pete and Julian Goicoechea	Cattle	154	8,350	3,839	975
Corta S&G	00243	USFS	Little Paris Sheep Company	Sheep	1,300	64,100	1,462	56

Source: (BLM, 2014b; USFS, 2011a)

3.13.2 Direct and Indirect Effects of Proposed Action

According to the USFS LRMP, livestock grazing must be postponed for a minimum of two years following prescribed fires, plantings, and seeding. The Ely RMP indicates that monitoring would be conducted to determine when grazing could resume in burned treatment areas. In the short-term, allotments may be rested or rotations of livestock may be modified to accommodate this requirement, which would represent a short-term loss of AUMs. Treatments would occur over a span of 10 years; therefore, treatments would be spread out and permittees would be able to adjust accordingly. Resting units and/or allotments following treatments may cause some hardship for permittees because they may not be able to graze the permitted amount of livestock for consecutive years. Additional losses may occur if frequent site visits are necessary to maintain a temporary structure or aggressively manage livestock away from treated areas. Additionally, hand thinning could occur throughout portions of the allotments that are located within the Project Area yet outside of a treatment unit; although, livestock grazing in areas of just hand thinning would not be suspended.

On BLM land, approximately two percent of the Warm Springs allotment, approximately two percent of the Cold Creek Allotment, and less than one percent of the Mitchell Creek allotment would be impacted by the Proposed Action. Therefore, impacts would be negligible to these allotments, although temporary grazing exclusion may be necessary in the treated areas. Temporary fencing could be installed around treatment areas for cattle permits, but sheep could be herded to avoid the treated areas for sheep permits. Additionally, the Tumbling JR could rotate use to accommodate grazing exclusion in the treated areas. There are no proposed treatment units within the Warm Springs Trail allotment.

Cracker Johnson Spring No.2 is within the Warm Springs allotment. Spring restoration activities would cause negligible, temporary direct impacts to livestock. Impacts include avoidance of the water source due to treatment application, although livestock would be able to use the water trough as soon as Project activities at the spring were complete. Some small loss of forage would occur due to fencing of the area around the spring, but this would not cause a decrease in permitted AUMs. Other water sources within the allotment would still be available for use by livestock.

On NFS land, approximately seven percent of the Cave Creek C&G allotment would be treated. A change in rotation of the livestock operation would be necessary to accommodate the two-year rest period. Duval Ranching Company has two permits with the USFS. Resting the units that are treated would cause some hardship for the permittee because he would not be able to graze the permitted amount of cattle for two years. The allotment's grazing plan would need to be re-evaluated and a new plan established during the two-year rest to accommodate the permittee for

the impact. Therefore, direct impacts to the Cave Creek C&G permittee would be minor and short-term.

For the Cherry Springs C&H allotment, approximately 27 percent of the allotment would be impacted by the Proposed Action. The Tumbling JR ranch has taken personal non-use three out of the four years on their permit; therefore, two years of resource protection non-use is not expected to have an impact. Harold Rother Farms, Inc. has sufficient BLM permits and private land that a two-year rest or a reduced number of livestock is not expected to have an impact.

For the Corta S&G allotment, less than one acre would be impacted by the Proposed Action. Because of the nature of herding sheep, the Project Area can be avoided to allow a two-year rest on the treated portion of the Project Area. Impacts would not be expected.

For the Sherman Creek allotment (Treatment Unit 1), approximately 12 percent would be impacted by the Proposed Action. Sherman Creek has a large section of private land in the allotment that is being treated by NRCS and NDOW to reduce large pinyon-juniper stands in uplands areas, which is part of the Proposed Action within Treatment Unit 1. Pete and Julian Goicoechea have additional BLM and private land that can sufficiently accommodate their livestock for a two-year rest. Additionally, reduced numbers of livestock are not expected to have an impact to this permit.

Short-term impacts to rangeland resources from the loss of AUMs would be minor. Rangeland conditions are expected to improve in the long-term following implementation of the Proposed Action because the health, recruitment, and production of perennial grasses, forbs, and shrubs would improve. Livestock would eventually have access to increased amounts of forage and forage diversity after the treatment areas are reopened. The enhanced quality and quantity of forage in the Project Area would improve overall livestock performance.

No impacts to range improvements (e.g., water troughs, pipelines, cattle guards, fences) would be anticipated from the Proposed Action, because these elements would be avoided during treatment application or repaired/replaced if incidental damage were to occur.

3.13.3 Direct and Indirect Effects of No Action Alternative

Under the No Action Alternative, livestock grazing in the Project Area would occur as currently permitted. The No Action Alternative would have minor long-term impacts to rangeland resources and livestock grazing resources from the continued establishment of pinyon and juniper trees in sagebrush communities. As tree establishment continues, forage availability would decline causing more competition between wildlife, wild horses, and livestock. Reductions in livestock grazing AUMs could be possible with declining understory species.

3.14 RECREATION

3.14.1 Affected Environment

The information present below has been summarized from the *Specialist Report, Recreation Resources, Overland Pass Habitat Improvement Project* (JBR, 2014e).

3.14.1.1 Recreation Management Designation

The recreation opportunity spectrum (ROS) is the method employed by the USFS for the management of recreation resources. Specifically, the ROS provides a framework for defining the types of outdoor recreation opportunities the public might desire, and identifies the range of the spectrum that particular areas of the National Forest might be able to provide (USFS, 1982).

Data provided by the USFS indicates that NFS land within the Project Area has been designated as either Primitive, Semi-Primitive Non-Motorized, or Semi-Primitive Motorized ROS classes (Figure 3.14-1). Specifically, approximately 698 acres of NFS land are classified as Primitive ROS class, approximately 8,264 acres as Semi-Primitive Non-Motorized ROS class, and approximately 16,305 acres as Semi-Primitive Motorized ROS class. The setting, activities, and experiences that define each of the ROS classes, according to the *ROS Users Guide* (USFS, 1982) are presented in Table 3.14-1. However, the table is not comprehensive of all experiences and activities that may be present within the ROS classes.

Table 3.14-1 Typical Characteristics of ROS Classes

ROS Class	Recreation Setting	Recreation Activities	Recreation Experiences
Primitive	Unmodified natural environment of fairly large size. Interaction between users is very low and evidence of other users is minimal. At least 3 miles from all roads or trails with motorized travel. Essentially free from evidence of human-induced restrictions and controls.	Hiking, backpacking, camping, gathering forest products, fishing, hunting, mountain climbing, horseback riding, general leisure, sightseeing, cross country skiing, and snow shoeing.	Extremely high probability of experiencing independence, closeness to nature, tranquility, and isolation from sights and sounds of humans. Offers opportunity for self-reliance through application of outdoor skills in an environment with high degree of challenge and risk.
Semi-Primitive Non-Motorized	Predominantly natural or natural-appearing environment of moderate to large size. Interaction between users is low, but there is often evidence of other users. Between 0.5 and 3 miles from roads or trails with motorized use. Evidence of human-induced controls and restrictions may be present, but are subtle.	Generally the same activities as listed for the Primitive ROS class.	High, but not extremely high, probability of experiencing independence, closeness to nature, tranquility, and isolation from sights and sounds of humans. Offers opportunity for self-reliance in an environment with some challenge and risk.

ROS Class	Recreation Setting	Recreation Activities	Recreation Experiences
Semi-Primitive Motorized	Setting is the same as listed for the Semi-Primitive Non-Motorized ROS class, only motorized use is also permitted. Within 0.5 mile of primitive roads or trails with motorized use, but no closer than 0.5 mile from better than primitive roads.	Generally the same activities as listed for the Primitive ROS class. May also include off-highway vehicle (OHV) use, scenic or leisurely driving, and snowmobiling.	Same as listed for the Semi-Primitive Non-Motorized ROS class. Opportunity to use motorized equipment is also offered.

Source: *ROS Users Guide* (USFS, 1982)

The BLM-administered public land within the Project Area is designated as an Extensive Recreation Management Area (BLM, 2008b). BLM-administered public land designated as Extensive Recreation Management Area is typically available for dispersed, backcountry, and undeveloped recreational uses (BLM, 2008b). Special Recreation Management Areas do not occur within the Project Area.

3.14.1.2 Recreation Setting

In general, the recreation setting characteristics presented in Table 3.14-1 for the Primitive, Semi-Primitive Non-Motorized, and Semi-Primitive Motorized ROS classes accurately describe the recreation settings that occur within the Project Area. The specific physical, social, and managerial characteristics that give value to the recreation settings within the Project Area, and contribute to its existence as the specified ROS class settings, or Extensive Recreation Management Area, are described in detail below.

Physical Setting

The Project Area is generally characterized by steep slopes and deep, narrow canyons (USFS, 1986b). Vegetation communities found in the Project Area are described in Section 3.17.1. Vegetation species composition has been altered from wildland fires, which have burned approximately 1,651 acres within the Project Area since 1999 (BLM, 2014a). Whereas wildland fires may affect the recreational setting as a result of altering vegetation, wildland fires would primarily affect the visual setting rather than the recreation setting.

A large portion of the Project Area consists of a natural environment, with very little evidence of humans. However, human modification within the Project Area is slightly to moderately evident in certain areas and most commonly occurs in the form of unpaved roads and trails. The NFS land designated as Primitive ROS class within the Project Area has several roads or trails open to motorized use within three miles (USFS, 2011c). In general, the areas designated as Semi-Primitive Non-Motorized or Semi-Primitive Motorized are within 0.5 mile of roads and trails open to motorized use. Most of the BLM-administered public land within the Project Area is within a few miles of a road or trail with motorized travel. The roads and trails that cross the

Project Area are likely used for or in connection with dispersed recreation activities that occur in the area. Two NHTs also cross the Project Area: the Pony Express Trail and the Hastings Cutoff of the California Trail.

The Burro Lake Trail (USFS No. 17172) is reached via Forest Road 57515 (Figure 3.14-1). The approximately two-mile single-track multiple use trail is outside the Project Area; however, the two-track road to reach the Burro Lake trailhead crosses through the Overland Pass treatment unit.

The Fort Ruby Interpretive Trail is currently under construction, and is located near Fort Ruby Spring on the USFS and USFWS boundary. Fort Ruby is located outside of the Project Area; however, part of the appeal of this interpretive trail is that visitors look out on the landscape and see views similar to historic views. There are no power lines or other human development easily visible from the fort.

In addition to roads and trails, the Project Area includes various past disturbances associated with mining activities located on BLM-administered public land in the southeast portion of the Project Area. There are also structures, campsites, fenced areas, and other isolated evidence of humans scattered throughout the Project Area.

Social Setting

Recreational use of the Project Area is frequent, but users are generally dispersed and not concentrated. Developed recreation sites located near the Project Area are limited to the South Ruby Campground (Figure 3.14-1) located two miles south of the Ruby Lake Wildlife Refuge headquarters (Figure 3.14-1). Shantytown is a small community of cabins (Figure 3.14-1) located approximately one mile south of the South Ruby campground on private land adjacent to the Project Area. The cabins are owned by people who recreate in the area. Within the Project Area, there are also many additional dispersed camping areas.

In areas of NFS land within the Project Area designated as Primitive ROS class, users are typically easily able to find solitude and isolate themselves from other users engaged in dispersed recreation. Interaction with other groups or individuals is less likely to occur within these portions of the Project Area than in portions designated as either Semi-Primitive Non-Motorized or Semi-Primitive Motorized ROS class. However, there are opportunities for isolation and solitude within areas designated as either Semi-Primitive Non-Motorized or Semi-Primitive Motorized ROS class, but users may need to avoid trails and roads to find these opportunities. Users are less likely to encounter or interact with motorized vehicles within portions of the Project Area that are designated as Primitive and Semi-Primitive Non-Motorized ROS class; however, there are several roads or trails open to motorized use within 0.5 mile of Primitive and

the Semi-Primitive Non-Motorized ROS class. Interactions with motorized vehicles is a possibility on NFS land within the Project Area designated as Semi-Primitive Motorized ROS class, as well as on BLM-administered public land within the Project Area.

Regardless of the ROS class designation, forests and woodlands generally provide the best opportunity within the Project Area for users to isolate themselves and somewhat escape the sight and sounds of humans. Vegetation cover in shrubland areas do not buffer the sight and sounds of other users as well as the conifer trees found in forests and woodlands.

Managerial Characteristics

Developed recreation sites located within the Project Area are limited to the South Ruby Campground (Figure 3.14-1). There are also many dispersed campsites within the Project Area where no facilities are available.

There are numerous roads and trails located throughout the Project Area that provide access for a variety of dispersed recreation activities. Non-motorized use is permitted on all roads and trails that cross NFS land and/or BLM-administered public land within the Project Area. On BLM-administered public land, motorized access is limited to open existing roads and trails. The roads and trails open for motorized use on NFS land are shown on the Motor Vehicle Use Maps for the Ruby Mountains Ranger District (USFS, 2011c). Despite numerous roads and trails within the Project Area, approximately 11,958 acres of NFS land within the Project Area are within the Pearl Peak Roadless Area (03-27A). The southern edge of the Ruby Mountains Wilderness is approximately 18 miles north of the Project Area.

3.14.1.3 Recreation Activities

Recreationists engage in a variety of recreation activities within the Project Area. With the exception of camping at the South Ruby Campground and the many dispersed campsites, recreation activities within the Project Area are dispersed. Dispersed recreational uses throughout the Project Area include hiking, backpacking, picnicking, camping, gathering forest products, hunting, mountain climbing, horseback riding, general leisure, and sightseeing. During winter months, dispersed activities include cross country skiing and snow shoeing. Additional dispersed activities on BLM-administered public land and NFS land designated as Semi-Primitive Motorized ROS class within the Project Area include scenic or leisure driving, OHV use, and snowmobiling.

3.14.1.4 Recreation Experiences

Recreation experience is the response or feeling that a user has from observing or participating in a recreation activity within a particular recreation setting (Bureau of Reclamation, 2011). Recreationists participate in preferred activities within preferred settings in order to realize a

desired experience or set of experiences (USFS, 1982). Some of the most common experiences that recreation users seek within the Project Area include the following, which may vary across the three ROS classes (Bureau of Reclamation, 2011):

- Experience the sights, sound, and smells of nature;
- Gain a sense of adventure and challenge;
- View wildlife and natural wonders;
- Experience challenges and risks;
- Experience tranquility and peacefulness;
- Experience solitude;
- Experience new and different things;
- Sense of physical exertion;
- Have fun and pleasure;
- Get away from the usual demands of life; and
- Reduce stress.

Challenge and risk opportunities associated with remote settings, self-reliance, or survival may be important to users that visit the Project Area. The sense of adventure from exploration of pristine areas may also be an important experience to users that visit the Project Area. Users placing a high degree of importance on challenge and risk opportunities in remote settings or pristine areas would most likely recreate in the Primitive ROS class and areas of the Semi-Primitive Non-Motorized ROS class located farther from roads and trails with motorized use.

3.14.2 Direct and Indirect Effects of Proposed Action

3.14.2.1 Disruption, Degradation, or Loss of Dispersed Recreation Activities

Dispersed recreation would likely be restricted within each treatment unit during the implementation of treatment activities. Restrictions would include travel restrictions for OHV and other motorized use within the treatment units located on BLM-administered public land and on NFS land designated as Semi-Primitive Motorized ROS class. Recreationists affected by the restrictions would be temporarily displaced from the treatment units during treatment implementation. Approximately 26,652 acres within the Project Area would remain available to recreationists during project implementation. Displaced recreationists would most likely relocate to these areas or any of the numerous areas outside of the Project Area where dispersed recreational activities are available and are similar to those within the treatment units. Following completion of treatments, any fencing installed around treatment units may deter access for recreational use or other uses. The Project would change the landscape somewhat to the west of the Interpretive Trail at Fort Ruby, but measures would be taken during implementation to preserve the visual quality of the area. Impacts would be minor and temporary within treatment units that are not fenced after treatment completion.

Within treatment units that are fenced, which may range from none to all units, impacts would be minor and short-term to minor and long-term, depending on how soon desired vegetation communities become established following the treatments. Riparian restoration activities at Cracker Johnson Spring No. 2 would include fencing the spring source. This fencing would result in a long-term, minor impact. However, there are numerous areas adjacent to the Project Area where dispersed recreational activities are available and are similar to those around the spring.

There would be a sign placed on either side of Overland Pass during Project implementation. These signs would provide information, such as what is occurring in the area in regards to the Project, why the Project is occurring, and what users can expect to be occurring in the area (such as prescribed fires, temporary machinery, and temporary closures).

3.14.2.2 Conflict with the ROS Classes

During the active implementation of the treatments, project equipment would be readily apparent when visible and would produce mechanized and motorized noises. Additionally, the personnel required to operate the project equipment would cause an increased presence of humans within the treatment units. Increased human presence, project noise, and any visible equipment during implementation of treatments would temporarily diminish recreation experiences of independence, tranquility, and isolation from the sights and sounds of humans. Recreation settings with little to no evidence of other users would be diminished temporarily from project equipment and personnel. The diminished opportunity for these experiences and settings would occur within the treatment units as well as areas within close proximity to the treatments units where equipment noises may be heard or equipment may be seen.

After a treatment is completed, the temporary increased presence of humans from project personnel, and the noises and sights of project equipment would no longer affect the recreation experiences or settings within or near the treatment unit. However, completed treatments would alter the physical setting in each of the treatment units. The primary component of the physical setting that would be modified is the vegetation characteristics. There would be a reduction in tree cover, or the creation of mosaic patches of tree cover within many of the treatment units. Because the purpose of the Proposed Action is to enhance greater sage-grouse and mule deer habitat, wildlife viewing and hunting opportunities would improve.

Recreation experiences related to the enjoyment of forest character would become less available within areas where tree cover is reduced. Reduced tree cover may also increase sight distance and allow users to see roads, managerial controls, or other users. Mastication, mulching, and Ely chain treatments would be apparent to some users as evidence of humans or human controls.

Prescribed burns and hand thinning treatments may appear more natural to many users. Any trees that are chipped, mulched, or otherwise left within the treatment unit after felling may also be perceived as evidence of humans. Additionally, any fencing installed around the perimeter of a treatment area after the treatment is complete would increase human evidence and managerial controls within the Project Area.

Impacts from the reduction in tree cover on the recreation experiences, settings, and activities would be long-term because the vegetation in the treatment units would be managed primarily for forbs, shrubs and grasses. Impacts from any fencing installed around the treatment units may be short-term or long-term, depending on how quickly desired vegetation conditions are achieved after treatments are completed.

The temporary and long-term impacts on recreation opportunities resulting from the Proposed Action would occur within each of the ROS classes within the Project Area, as well as Extensive Recreation Management Area.

Approximately 239 acres (34 percent) of the NFS land designated as Primitive ROS class are within the boundaries of the East Sherman proposed treatment unit (Figure 3.14-1). Recreation within this treatment unit would be impacted from diminished opportunity for experiences and settings with minimal evidence of other people during implementation of treatment activities. The remaining area of Primitive ROS class within the Project Area is adjacent to the unit boundary and project noise and sights would be expected to impact the recreation setting and experiences in this area as well. However, there are approximately 2,074 acres of adjacent NFS land designated as Primitive ROS class located approximately 0.6 mile west of the area of Primitive ROS class within the Project Area. The temporary effects on experiences and settings from project equipment and personnel would not be expected to occur within Primitive ROS class outside of the Project Area, and displaced users would likely use it for the duration of the treatment within the Project Area. The temporary impacts on recreation within the Primitive ROS class would be minor.

Long-term impacts on recreation within Primitive ROS class of the Project Area would be moderate because users would be less likely to have an extreme probability of experiences free of the sights of humans, and less likely to find settings free of human-induced controls. However, over time, the long-term impacts within Primitive ROS class would eventually decrease from moderate as shrubs and grasses colonize the treatment unit and vegetation cover appears to have established more from natural succession rather than treatment activities.

Approximately 1,298 acres (16 percent) of the NFS land designated as Semi-Primitive Non-Motorized ROS class are within the boundaries of proposed treatment units (Figure 3.14-1). The

temporary impacts from diminished opportunity for experiences of independence, tranquility, and isolation from the sights and sounds of humans, and for settings with little to no evidence of other users or people would occur within this area. However, the majority of the remaining NFS land designated as Semi-Primitive Non-Motorized ROS class within the Project Area is at a sufficient distance from the treatment units that temporary impacts would be negligible. There are approximately 12,475 acres designated as Semi-Primitive Non-Motorized ROS class within two miles of the Project boundary where effects of project equipment and personnel would not be expected. Users displaced from the NFS land within the Project Area designated as Semi-Primitive Non-Motorized ROS would be expected to use the unaffected areas adjacent to the Project Area. The temporary impacts on recreation within the Semi-Primitive Non-Motorized ROS class would be minor.

Temporary impacts would be expected to affect the majority of Semi-Primitive Motorized ROS class within the Project Area. Temporary impacts would be minor because experiences of independence, tranquility, and isolation from the sights and sounds of humans are less critical to this ROS class. Because the Semi-Primitive Motorized ROS class offers opportunities to use motorized equipment, experiences including some degree of motorized noises and sights are to be expected (Table 3.14-1). Additionally, recreation setting within the Semi-Primitive Motorized ROS class often includes evidence of other people or users.

Long-term impacts on areas designated either Semi-Primitive Non-Motorized or Semi-Primitive Motorized ROS class would be minor. Impacts would be minor because experiences of independence, tranquility, and isolation from the sights and sounds of humans are less critical to these ROS classes, as are settings with little evidence of other users or human-induced controls. Users most sensitive to changes in experiences or settings would be likely to use any of the areas within close proximity to the Project Area that are designated Primitive or Semi-Primitive Non-Motorized ROS class. Implementation of the project treatments would not conflict with the management direction or standards for recreation resources provided by the LRMP.

The aforementioned temporary and long-term impacts on recreation experiences, settings, and activities resulting from the Proposed Action would also occur within Extensive Recreation Management Area. However, some Extensive Recreation Management Area within the Project Area would not be affected, and large areas of BLM-administered public land managed as Extensive Recreation Management Area within reasonable distance of the Project Area would not be affected. Thus, dispersed, backcountry, and undeveloped recreational opportunities would still remain available to users on BLM-administered public land. Implementation of the project treatments would not conflict with the recreation goals and objectives stated in the BLM Ely RMP.

3.14.3 Direct and Indirect Effects of No Action Alternative

Under the No Action Alternative, the existing conditions would continue to depart from the historic range of variability of vegetation types where pinyon and juniper increasingly dominate the vegetation. The existing setting, activities and experiences that define and characterize the dispersed recreation opportunities within the Project Area would not be impacted. However, hunting may be impacted from the No Action Alternative because the treatments specified in the Proposed Action are proposed, in part, to help improve mule deer habitat. The No Action Alternative would not directly or indirectly preclude or contribute to the disruption, degradation, or loss of dispersed recreation opportunities. The No Action Alternative would not conflict with any of the ROS classes within the Project Area. The No Action Alternative would not conflict with the management direction and standards set forth in the LRMP and BLM Ely RMP.

3.15 SOILS AND HYDROLOGY

3.15.1 Affected Environment

The information and analysis presented in this section has been summarized from the *Specialist Report, Hydrology and Soils, Overland Pass Habitat Improvement Project* (JBR, 2014a). Please refer to the specialist report for detailed methods and further analysis information.

The NRCS has mapped the soil associations on approximately 20,817 acres of the Project Area (NRCS, 2014). The most predominant soil associations mapped by NRCS within the Project Area include:

- Pookaloo-Cavehill-Rock outcrop association (4,713 acres);
- Palinor-Urmafot association (3,748 acres);
- Urmafot-Borvant-Biken association (4,058 acres);
- Bobs-Fax-Parisa association (1,673 acres);
- Onkeyo-Cavehill-Pookaloo association (1,975 acres); and
- Parisa gravelly loam (1,374 acres).

These soil associations are found on mountains and fan remnants throughout east-central Nevada. They have characteristics of being predominantly shallow, well-drained loam or silt loam with high gravel content, and the depth to water table is typically greater than 80 inches (NRCS, 1998).

An additional 22,635 acres of soil data within the Project Area was provided by NRCS, covering the majority of NFS lands in the Project Area. The NRCS data is under review, considered preliminary, undergoing refinement, and approximately 15 percent of the Project Area (3,383 acres) is incomplete. According to the soils data, dominant soil associations within the Project Area include the Karpp-Bobs-Chiara association (6,327 acres), Bobs-Borvant-Xine association

(5,144 acres), and Cavehill-Grink-Onkeyo association (4,426 acres). These soil associations are found on fans and fan remnants, as well as mountain slopes. They are shallow, well drained soils that exhibit a range of slight to high erosion potential by water and slight erosion potential by wind (NRCS, 1998).

Hydrologic resources specific to the Project Area include 49 drainages for a total length measuring approximately 76 miles (USGS, 2014) (Figure 3.15-1). Drainages in the Project Area are comprised of ephemeral drainages (approximately 73.7 miles) and a perennial stream (approximately 2.3 miles). Willow Creek is the only perennial stream that crosses the Project Area (USGS, 2014). Of the 49 drainages crossing through the Project Area, 21 drainages cross through or intersect eight of the 10 treatment areas, and all are ephemeral. Available data (USGS, 2014) indicate that the East Sherman and Walker Canyon treatment units contain no known hydrologic resources (Figure 3.15-1). Eleven spring sites, as classified by the NHD (USGS, 2014), were identified within the Project Area. One additional spring, identified from the NDOW spring GIS data, is located in the Project Area (NDOW, 2014), for a total of 12 documented spring sites (Figure 3.8-1).

There are 11, 12-digit HUC (HUC 12) watersheds, which are equivalent to Level 6 watersheds, that occur within or partially within the boundary of the Project Area (Figure 3.15-2):

- Big Wash;
- Cave Creek-Frontal Ruby Lake;
- Cherry Canyon;
- Fort Ruby Spring-Frontal Ruby Lake;
- Lower Conners Creek;
- Mill Spring;
- Ruby Lake;
- Sestanovich Creek;
- Sherman Creek-Huntington Creek;
- Walker Canyon-Huntington Creek; and
- Woodward Creek-Frontal Ruby Lake.

The condition of seven of the HUC 12 watersheds were evaluated in past analysis (USFS, 2014a) using the Watershed Conditions Classification Technical Guide (Potyondy and Geier, 2011). At the time of the analysis, all seven of the watersheds were classified as “Functioning at Risk”, primarily because of poor soils and aquatic habitat and poor to fair riparian and wetland vegetation.

3.15.2 Direct and Indirect Effects of Proposed Action

The proposed treatments would require minimal surface disturbance. Staggering the treatments over a period of 10 years would reduce the total soil disturbance at any given time during implementation of the Proposed Action. While soils with a high risk of erosion from water runoff would be impacted, erosion and sedimentation of streams and springs would be reduced with implementation of design features and BMPs. A complete list of hydrology BMPs specific to the Project can be found in Appendix F. Over time, as sagebrush and other native shrubs and herbaceous species establish within the treatment units, soil stability would increase and the potential for erosion would decrease. Accordingly, the Proposed Action would be expected to have temporary minor effects and negligible long-term effects to soils resources.

Increased flow within the channel below Cracker Johnson Spring No. 2 may occur after noxious weed removal; however, establishment of native vegetation would likely decrease flow due to plant uptake. No change to the amount and frequency of stream flow events emanating from drainage networks in the HUC 12 watersheds within or intersecting the Project Area due to variation in weather patterns would result from the Proposed Action. Intensity and duration of stream flow events may possibly be altered by increased runoff or reduced water uptake due to removal of vegetation. Because all drainages within the treatment units are ephemeral, temporary negligible impacts would be expected to hydrologic resources.

3.15.3 Direct and Indirect Effects of No Action Alternative

Under the No Action Alternative, there would be no direct effects to existing hydrologic and soil resources. However, if the No Action Alternative is implemented, indirect effects are likely due to continued establishment of pinyon and juniper trees, which results in reduced understory vegetation, critical for soil stabilization. This continued establishment would have long-term, minor indirect effects, such as increased risk of erosion due to a lack of understory species and increased bare ground.

3.16 SPECIAL STATUS AND CANDIDATE SPECIES

3.16.1 Affected Environment

For purposes of this analysis, the term “special status species” refers to any species satisfying one or more of the following conditions:

- Federally Threatened or Endangered Species: Any species that the USFWS has listed as an endangered or threatened species under the Endangered Species Act (ESA) throughout all or a significant portion of its range;
- Proposed Threatened or Endangered Species: Any species that the USFWS has proposed for listing as a federally endangered or threatened species under the ESA;

- Candidate Species: Plant and animal taxa that are under consideration for possible listing as threatened or endangered under the ESA;
- BLM Sensitive Species: 1) Species that are currently under status review by the USFWS; 2) Species whose numbers are declining so rapidly that federal listing may become necessary; 3) Species with typically small and widely dispersed populations; or 4) Species that inhabit ecological refugia or other specialized or unique habitats;
- USFS Sensitive Species: Species identified by a Regional Forester for which population viability is a concern; and
- State of Nevada Listed Species: Any species that the State of Nevada has listed as a threatened or endangered species under the NAC Chapter 503.

Information regarding any known or potential occurrences of special status plant and wildlife species within or near the Project Area was requested from USFWS, NDOW, and the Nevada Natural Heritage Program (NNHP). The USFWS responded with a letter (USFWS, 2014b). The NDOW responded with a letter, GIS data, and a series of maps (NDOW, 2012) focusing on the Project Area and a three-mile radius for general wildlife. The letter also included all known bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*) nest locations within 10 miles of the Project Area. The NNHP responded with a letter and list of species within a five kilometer radius of the project area (NNHP, 2014). Additional information was gathered from the Project Area survey conducted for special status plant species (ENLC, 2012) (Appendix D).

Detailed methods of analysis and more information can be found in the following reports: *Specialist Report and Biological Evaluation, Wildlife, Overland Pass Habitat Improvement Project* (JBR, 2014f) and *Specialist Report, Vegetation Resources and Invasive and Noxious Weeds, Overland Pass Habitat Improvement Project* (JBR, 2014d).

Plants

No threatened or endangered species were identified to occur within the Project Area (USFWS, 2014b). However, whitebark pine (*Pinus albicaulis*), a candidate species, was listed with potential to occur in the Project Area (USFWS, 2014b). According to NNHP (2014), two at risk species have occurrences near, but outside, the Project Area: Mount Wheeler sandwort (*Arenaria congesta* var. *wheelerensis*) and Holmgren smelowskia (*Smelowskia holmgrenii*). The Project Area was surveyed for the following list of nine species (five USFS Region 4 special status species and four BLM Ely District special status species) by the Eastern Nevada Landscape Coalition in 2012:

- Grouse Creek rockcress (*Boechera (Arabis) falcatoria*);
- Upswept moonwort (*Botrychium ascendens*);

- Dainty moonwort (*Botrychium crenulatum*);
- Slender moonwort (*Botrychium lineare*);
- Pennell draba (*Draba pennellii*);
- Nevada willowherb (*Epilobium nevadense*);
- Ruby Mountains primrose (*Primula capillaris*);
- Nachlinger catchfly (*Silene natchlingerae*); and
- Holmgren smelowskia.

None of the above listed species were found during the 2012 survey (ENLC, 2012). Additional analysis indicated the potential for Lamoille Canyon milkvetch (*Astragalus robbinsii* var. *occidentalis*) to occur within the project area (JBR, 2014c). Even though Lamoille Canyon milkvetch was not a target species in the 2012 sensitive species survey, this species is found in habitats similar to the surveyed moonwort species. The moonwort species and associated habitats were not observed during the survey, therefore Lamoille Canyon milkvetch is also likely not present in the Project Area. However, this species may still occur in the Project Area. Whitebark pine was also not a target species in the 2012 sensitive species survey, and was not found during the survey (ENLC, 2012). This species does not typically grow in any of the targeted treatment habitat types. Additionally, this is a relatively large sized plant that would be easy to identify and avoid during treatment application. Further detailed analysis and species specific information can be found in the *Biological Evaluation, Special Status Species, Overland Pass Habitat Improvement Project* (JBR, 2014c).

Wildlife

Greater sage-grouse have been documented in the Project Area (JBR, 2014f), and there are six known greater sage-grouse leks in the vicinity of the Project Area, three of which are active and three of which the status is unknown (NDOW, 2013). Greater sage-grouse is a BLM sensitive species, USFS sensitive species, and a candidate species for listing under status review by the USFWS. Greater sage-grouse is also a protected game bird managed in accordance with the *Greater Sage-Grouse Conservation Plan for Nevada and Eastern California* (NDOW, 2004).

Greater sage-grouse have the potential to exist throughout the Project Area, especially in areas dominated by sagebrush. Avoidance of pinyon-juniper habitats by greater sage-grouse has been documented (Freese, 2009); therefore, those habitat types within the Project Area may be avoided by greater sage-grouse. Greater sage-grouse could be expected to use the sagebrush habitat in the Project Area for the majority of their lifecycle requirements. According to NDOW (2012), the majority of the Project Area is categorized as low value or transitional habitat. Areas of essential/irreplaceable and important greater sage-grouse habitat occur in the northwestern, southern, and eastern portions of the Project Area (NDOW, 2012).

On March 15, 2012, the BLM issued a White Paper on greater sage-grouse habitat on BLM-managed and NFS land (BLM, 2012b). The paper states that the BLM and USFS will focus on two categories of greater sage-grouse habitat including Preliminary Priority Habitat (PPH) and Preliminary General Habitat (PGH). PPH comprises areas identified by the BLM as having the highest conservation value for maintaining sustainable sage-grouse populations. These areas include breeding, late brood-rearing, and winter concentration areas. PGH comprises areas of occupied seasonal or year-round habitat outside of priority habitat (BLM, 2012b). According to BLM habitat data (BLM, 2012b), there are approximately 6,369 acres of PPH and 5,997 acres of PGH within the Project Area. Additionally, on October 2, 2012, the USFS issued the Interim Conservation Recommendations for Greater Sage-grouse and Greater Sage-grouse Habitat (USFS, 2012b), which promotes the conservation of sustainable sage-grouse populations and their habitats by enhancing and restoring habitat conditions to meet sage-grouse life history needs.

Other special status species that have been documented either within the Project Area or in the vicinity of the Project Area include golden eagle (NDOW, 2012) and pinyon jay (JBR, 2014f). Golden eagle and pinyon jay are both designated as BLM sensitive species, and golden eagle are protected under the Bald and Golden Eagle Protection Act (BGEPA). BLM policy is to provide sensitive species with the same level of protection as is provided for candidate species (BLM, 2008c). Fifteen golden eagle nests have been identified within 10 miles of the Project Area (NDOW, 2012).

Other bird species that are designated as sensitive species by either BLM and/or the USFS that are likely to occur within the Project Area based on the presence of suitable habitat include western burrowing owl, ferruginous hawk (*Buteo regalis*), gray flycatcher, loggerhead shrike, sage thrasher, and Brewer's sparrow. The NNHP also indicated that habitat may be available for the Phainopepla (*Phainopepla nitens*), a NNHP at-risk species (NNHP, 2014).

The special status big game specie that may occur within the Project Area is bighorn sheep (*Ovis canadensis*). According to NDOW (2012), bighorn sheep distribution is present in the Ruby Mountains in the northeastern portion of the Project Area and the northern portion of the 3-mile radius of the Project Area.

Small terrestrial mammals considered special status species that could occur within suitable habitat in the Project Area include pygmy rabbit and dark kangaroo mouse (*Microdipodops megacephalus*). Potential pygmy rabbit habitat within the Project Area includes areas with deeper soils and big sagebrush on inset fans and the valley bottoms. It is not known if pygmy rabbits avoid habitats with pinyon and juniper cover. The dark kangaroo mouse is usually found

on stabilized sand dunes and in fine, gravelly soils (O'Farrell and Blaustein, 1974). There are no known dunes within the Project Area, although some gravelly soils do exist.

Suitable bat foraging and watering habitat exists within the Project Area, and a variety of special status bat species would be expected throughout the Project Area. The NNHP indicated that habitat for the long-legged myotis (*Myotis volans*) may occur in the Project Area (NNHP, 2014). Other special status bat species that are likely to occur include silver-haired bat (*Lasionycteris noctivagans*), California myotis (*Myotis californicus*), western small-footed myotis (*Myotis ciliolabrum*), long-eared myotis (*Myotis evotis*), little brown myotis (*Myotis lucifugus*), and fringed myotis (*Myotis thysanodes*) (JBR, 2014f).

Several springs within the Project Area are expected to provide habitat for springsnails, but formal surveys have not been completed to confirm the presence or absence of springsnails.

3.16.2 Direct and Indirect Effects of Proposed Action

Plants

The Proposed Action may impact individuals but is not likely to cause a trend toward federal listing or loss of viability for special status species, because there are no known occurrences within the Project Area. If occurrences become known, those locations would be marked and avoided during treatment application. Direct short-term impacts from treatment activity would include trampling, crushing, or burning of unmarked occurrences of individual plants. However, the long-term objective of the vegetation treatments is to improve ecological health and resilience within the Project Area, which would improve special status species habitat.

Bighorn Sheep

Injury or mortality of bighorn sheep would not be expected as a result of implementing the Proposed Action. If bighorn sheep were present in a treatment unit, it would be expected that they would vacate the unit prior to Project equipment and activities reaching their location. Noise and visual disturbances, as well as smoke and dust associated with treatment activities and equipment may cause avoidance of the treatment units during implementation. Displaced bighorn sheep would likely use similar habitat surrounding the treatment units, which is abundant within relatively close proximity to the Project Area. After implementation, bighorn sheep would be expected to return to the treatment units. Displacement would not be expected to result in mortality or reduced populations, and impacts would be temporary and negligible. Impacts to bighorn sheep habitat would be negligible as habitat is abundant in adjacent areas and treatments would be spaced over 10 years. Additionally, the Proposed Action would result in improved foraging habitat in the long-term for bighorn sheep.

Greater Sage-grouse

Direct effects to greater sage-grouse under the Proposed Action could include avoidance of the Project Area during implementation and mortality incidental to project vehicles, mechanical treatments, or prescribed burning. Vehicle-related mortality would be unlikely because speed limits would be limited to 20 mph or less within the Project Area. Direct effects would be lessened by treatment design features requiring treatments to be conducted outside of the lekking/nesting/early brood-rearing time periods.

Greater sage-grouse could be indirectly affected by modifications to habitat if the treatments do not yield the desired outcomes. Pinyon-juniper removal in the Project Area would be expected to enhance sagebrush habitat if treatments are successful, but there is risk associated with any vegetation treatment.

Hand thinning would directly remove pinyon and juniper from the Project Area and result in suitable greater sage-grouse habitat. Understory species already utilized by greater sage-grouse would remain intact and be immediately available for use. Prescribed fire in the pinyon and juniper established areas would allow native plant communities to regenerate thereby restoring and maintaining the sagebrush habitats. The reduction of pinyon-juniper canopy would increase sunlight and moisture available to the understory, allowing shrubs, grasses, and forbs to increase in density and cover. Vegetation desirable to greater sage-grouse would increase in these areas.

Chaining would directly remove tree cover and in the long-term would result in habitat that could be utilized by greater sage-grouse. Mastication or mechanical whole tree thinning can be a selective process and would occur where chaining isn't feasible. This process would disturb less understory vegetation. With the removal of tree species, desirable understory species would become established and the quality and quantity of sagebrush habitat would increase. However, approximately 10 to 15 years may be required before these areas are suitable sage-grouse habitat.

Direct impacts to sage-grouse from the restoration of Cracker Johnson Spring No. 2 include temporary displacement from the spring site during treatment activities; however, impacts would be negligible because other spring locations would be available throughout the Project Area. Once the restoration is complete and vegetation has established, the quality of this area for use by sage-grouse would improve.

Impacts to leks would include disturbance from increased traffic on Project Area access roads during treatment application. Three active leks occur within three miles of the Project boundary: Sherman Creek, Sherman Creek 2, and Blue Jay Road. Project Area access roads that may impact these leks include Ruby Valley Road, Overland Pass, and Huntington Valley Road. The

two Sherman Creek leks range from 1.4 to 1.75 miles from the Huntington Valley Road. Several other active and inactive leks in Ruby Valley range from 3.0 to 4.7 miles from the intersection of Ruby Valley Road and Overland Pass, and from 1.0 to 2.6 miles from the Ruby Valley Road. However, Project design features restrict treatment application within three miles of active leks during the lekking season (March 1 to June 30). Therefore, impacts to leks from Project access traffic would be negligible.

The Project would likely not cause the greater sage-grouse populations within the Project Area or the surrounding PMUs to decline. The Project would be localized and approximately 26,650 acres of available habitat within the Project Area would not be disturbed. Direct impacts would be temporary, negligible, and limited to individuals, and not entire populations. The greater sage-grouse population would be expected to increase or remain static as a result of the Proposed Action because the Project would enhance the quality of the habitat for this species. Long-term effects of the Proposed Action would be the increase in quantity and quality of sagebrush habitat within the Project Area. The determination is that the Proposed Action may impact individuals but is not likely to contribute to a trend towards federal listing or loss of viability.

Other Special Status Bird Species

To minimize impacts to nesting raptors, including golden eagle and ferruginous hawk, treatments would not be conducted from March 1 through August 31 within 0.5 mile of active raptor nests, unless the nest has been determined inactive for at least five years. If raptor nests are identified during implementation, the corresponding agency biologist would be notified immediately and the nest area would be avoided until a determination of the species and nest activity can be made. Agency biologists and the NDOW would be consulted prior to any treatment to determine if any additional measures should be implemented for treatment activities occurring outside the dates listed above.

Golden eagle and ferruginous hawk may avoid foraging habitat within a particular treatment unit during implementation of the treatment activities within the unit. This would be negligible as the surrounding area provides abundant foraging habitat and prey base, and displacement from treatment units would be temporary for the duration of treatment activities. In the immediate short-term there would be a decrease in prey base within the treatment units following the treatment activities. However, over time, prey base would be expected to increase and the quality of foraging habitat in the treatment units would increase.

Indirect effects to golden eagle and ferruginous hawk from the Proposed Action would be negligible and temporary to short-term. The Proposed Action would not be expected to directly impact either species beyond negligible short-term effects. Impacts associated with this Project would not result in reducing population viability, existing distribution, or result in a downward

trend in habitat capability, primarily because the Project would not change habitat composition over a large enough area. No take of golden eagle, ferruginous hawk, or any other raptors would be anticipated.

Treatments to be implemented under the Proposed Action are not planned for typical western burrowing owl habitat. Western burrowing owls do not use areas with dense shrub components or areas with pinyon and juniper cover. Design features would require avoidance of equipment storage and staging areas in areas with known western burrowing owls. Therefore, impacts to western burrowing owls from the Proposed Action would not be anticipated.

Direct and indirect effects of the Proposed Action on pinyon jay, gray flycatcher, loggerhead shrike, sage thrasher, and Brewer's sparrow are addressed in the discussion on impacts to migratory birds (Section 3.5.2).

Pygmy Rabbit

Temporary, negligible direct effects to pygmy rabbits as a result of the Proposed Action include noise disturbance and avoidance of the area during mechanical treatment activities. Prescribed burning and mechanical treatments would have negligible impacts from mortality, because treatments would not be conducted during the breeding season (January 15 to June 30), in occupied habitat, without pre-clearance surveys. Mortality from collisions with or crushing beneath Project vehicles would be unlikely because vehicles would be operated at speeds of 20 mph or slower.

Short-term indirect effects to pygmy rabbits would include any treatments that reduce sagebrush density from habitat that provides cover, as this may increase predation and influence rabbits to not use otherwise suitable habitat. Chaining would occur in areas with heavy tree cover, which are unlikely to provide high-fidelity burrows. However, chaining would remove some understory vegetation as well as the tree cover, possibly resulting in damage to burrows. Mastication would leave wood chips in the treatment areas, which may block burrow entrances. However, mastication would occur mostly in Phase II and III woodlands, which is not typically inhabited by pygmy rabbits. To reduce these impacts, mastication would occur outside of the pygmy rabbit breeding season in areas that are deemed as pygmy rabbit habitat by the corresponding land management agency. Under the Proposed Action sagebrush would be expected to increase over time, so indirect effects would be negligible and short-term.

The Proposed Action is not likely to cause pygmy rabbit populations to have long-term declines in population numbers or trends. The Proposed Action may impact individuals but is not likely to contribute to a trend towards federal listing or loss of viability.

Dark Kangaroo Mouse

Although dark kangaroo mice have not been observed within the Project Area, potential habitat for the dark kangaroo mouse is present, based on soils in the Project Area. The dark kangaroo mouse spends the majority of daylight hours, or when project work would be completed, in their burrows. It is unlikely that individual mice in their burrows would be impacted by any of the mechanical treatments. It is not known if prescribed fire activities would impact dark kangaroo mouse habitat. Habitat changes that would occur after trees are removed would potentially benefit kangaroo mice by increasing foraging habitat through the increase in herbaceous vegetation and the associated increase in seed production.

Short- and long-term effects associated with habitat disturbance are expected to be negligible. Impacts associated with habitat modification would not result in reducing population viability, existing distribution, or result in a downward trend in habitat capability, primarily because the current habitat is not ideal for dark kangaroo mice nor would Project activities directly harm mice, if present.

Bat Species

Direct effects associated with the Proposed Action may include disturbance of roosting bats from Project noise and mechanical mortality of bats roosting in pinyon or juniper trees within the treatment areas. Densities of roosting bats in trees would be expected to be very low. Bats using the area for nightly foraging or watering would be unlikely to be impacted as treatments would be carried out during daylight hours when bats are not in the area. Road-related mortality is not likely due to the 20 mph speed limits for Project equipment. Negligible direct effects to bats would be anticipated.

Indirect effects to bats would be related to the change in vegetative structure after treatments. This change in structure may cause a change in foraging habitats within treated areas. However, it is not expected that this change in structure would affect the foraging quality within the Project Area, as most species of Great Basin bats also use sagebrush habitat for foraging (Bradley et al., 2006; WBWG, 2005). Indirect effects would be negligible. The Proposed Action would not result in reducing population viability, or reduce existing distribution in the long-term, nor would these impacts result in a downward trend in habitat quality for bats.

Springsnails

Direct and indirect effects to springsnails (or aquatic invertebrates) would not be anticipated from the Proposed Action because of avoidance of springs during vegetation treatment. Springsnails were not found in Cracker Johnson Spring during a 2007 survey conducted by SRK Consulting (SRK, 2007). Therefore, the Proposed Action, including restoration at Cracker

Johnson Spring No. 2, would not result in reducing population viability, existing distribution, or result in a downward trend in habitat capability.

3.16.3 Direct and Indirect Effects of No Action Alternative

Plants

The No Action Alternative would not have any direct impacts to special status plant species. However, increases in pinyon and juniper tree density could impact site hydrology, and may have negligible long-term indirect impacts to species that require moist areas for growth.

Wildlife

Under the No Action Alternative pinyon-juniper establishment would continue to decrease the amount of sagebrush dominated habitat available within the Project Area. While no direct effects would occur, the indirect effects of declining habitat quality may impact individuals of sagebrush-obligate species and species strongly dependent on sagebrush, such as sage-grouse and pygmy rabbits. The No Action Alternative would not be likely to contribute to a trend towards federal listing or loss of viability of special status wildlife species within the Project Area.

3.17 VEGETATION RESOURCES

3.17.1 Affected Environment

Vegetation for the Project Area was described using the LANDFIRE BpS and succession classes layers (LANDFIRE, 2010) (Figure 3.17-1). BpS represents vegetation that may have been dominant on the landscape prior to Euro-American settlement and is based on both the current biophysical environment and an approximation of the historical disturbance regime. The succession class characterizes current vegetation conditions with respect to the vegetation species composition, cover, and height ranges of successional states that occur within each BpS. Succession classes can also characterize vegetation components, such as exotic species, that were not found within the compositional or structural variability of successional states defined for a BpS. Any BpS of less than one acre within the Project Area was omitted from the analysis. The BpS in the Project Area are based on terrestrial ecological classifications (NatureServe, 2011). Succession classes are described in Table 3.17-1, which was adapted from Table 3-8 in the *Interagency Fire Regime Condition Class Guidebook* (Barrett et al., 2010).

Table 3.17-1 Succession Class Descriptions

Succession Class Code	Succession Class Description	Forests and Woodlands	Shrublands and Grasslands
A	Early-seral, post replacement	Single layer; fire response shrub, graminoids, and forbs; typically less than 10 percent tree canopy cover; standing dead and down	Fire response forbs; resprouting shrubs; resprouting graminoids
B	Mid-seral, closed canopy	One to two upper layer size classes; greater than 35 percent canopy cover (crown closure estimate); standing dead & down; litter/duff	Upper layer shrubs or grasses; less than 15 percent canopy cover (line intercept)
C	Mid-seral, open canopy	One size class in upper layer; less than 35 percent canopy cover; fire-adapted understory; scattered standing dead and down	Upper layer shrubs or grasses; greater than 15 percent canopy cover shrubs
D	Late-seral, closed canopy	Single upper canopy tree layer; one to three size classes in upper layer; less than 35 percent canopy cover; fire-adapted understory; scattered standing dead and down	Upper layer shrubs or grasses; less than 15 percent canopy cover
E	Characteristic; late-seral, closed canopy	Multiple upper canopy tree layers; multiple size classes; greater than 35 percent canopy cover; shade-tolerant understory; litter/duff; standing dead and down	Upper layer shrubs or grasses; greater than 15 percent canopy cover shrubs
UN	Uncharacteristic native vegetation cover or structure or composition	Example: conifer established shrubland	
UE	Uncharacteristic exotic vegetation	Example: cheatgrass dominated community	

Table 3.17-2 shows the BpS and succession class acreages in the Project Area.

Table 3.17-2 Biophysical Settings and Succession Classes in the Project Area

Biophysical Setting	Succession Class (acres)							Total Acres
	A	B	C	D	E	UN	UE	
Great Basin Pinyon-Juniper Woodland	-	20.7	691.4	2,095.5	2,372.8	2,499.1	0.7	7,680.1
Great Basin Xeric Mixed Sagebrush Shrubland	-	574.6	344.7	583.6	-	2,796.2	39.2	4,338.3
Inter-Mountain Basins Big Sagebrush Shrubland	-	52.8	3,378.8	1,687.1	8,533.2	9,593.6	41.4	23,286.9
Inter-Mountain Basins Curl-leaf Mountain Mahogany Woodland and Shrubland	295.5	19.8	189.9	140.2	223.2	13.0	0.2	881.8
Inter-Mountain Basins Mixed Salt Desert Scrub	-	14.3	12.8	-	-	-	-	27.1
Inter-Mountain Basins Montane Riparian Systems	2.0	585.0	42.0	-	-	175.1	42.2	1,046.2
Inter-Mountain Basins Montane Sagebrush Steppe	7.4	1.1	1,245.3	1,143.2	7,474.0	606.6	29.6	10,507.1

Biophysical Setting	Succession Class (acres)							Total Acres
	A	B	C	D	E	UN	UE	
Inter-Mountain Basins Semi-Desert Grassland	-	-	-	-	-	2.4	0.2	2.6
Inter-Mountain Basins Semi-Desert Shrub-Steppe	-	8.5	-	-	-	39.9	0.4	48.7
Inter-Mountain Basins Sparsely Vegetated Systems	-	-	-	-	-	-	-	28.5*
Inter-Mountain Basins Subalpine Limber-Bristlecone Pine Woodland	5.9	1.3	0.2	-	-	-	-	7.4
Rocky Mountain Aspen Forest and Woodland	88.8	17.1	3.8	30.2	-	84.4	-	224.3
Southern Rocky Mountain Mesic Montane Mixed Conifer Forest and Woodland	2.2	42.6	5.1	-	-	-	-	49.9

*Total acreage for this community was not in a described succession class, but rather considered "sparsely vegetated", a National Land Cover Database cover class.

3.17.1.1 Biophysical Setting Descriptions

Great Basin Pinyon-Juniper Woodland

This ecological system occurs on warm, dry sites on mountain slopes, mesas, plateaus, and ridges, typically at elevations between 1,600 and 2,600 meters (5,250 to 8,530 feet) above mean sea level (AMSL). These woodlands can be dominated solely by or a combination of singleleaf pinyon and Utah juniper. Understory species are variable but include low sagebrush (*Artemisia arbuscula*), black sagebrush (*Artemisia nova*), big sagebrush (*Artemisia tridentata*), curl-leaf mountain mahogany (*Cercocarpus ledifolius*), and others. Typical herbaceous species include needle and thread (*Hesperostipa comata*), Idaho fescue (*Festuca idahoensis*), bluebunch wheatgrass (*Pseudoroegneria spicata*), and basin wildrye (*Leymus cinereus*).

Great Basin Xeric Mixed Sagebrush Shrubland

This ecological system occurs on flat to steep slopes on a variety of landforms, including flats and plains, alluvial fans, rolling hills, rocky hillslopes, saddles, and ridges between 1,000 and 2,600 meters (3,280 to 8,530 feet) AMSL. This system is associated with shallow, rocky soils that experience severe drought during the summer. These shrublands are dominated by black sagebrush at low and mid elevations, little sagebrush at higher elevations, and may have a co-dominance of Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) or yellow rabbitbrush (*Chrysothamnus viscidiflorus*). Numerous other shrubs may be present in the community, including shadscale (*Atriplex confertifolia*), jointfir (*Ephedra* sp.), spiny hopsage (*Grayia spinosa*), bud sagebrush (*Picrothamnus desertorum*), black greasewood (*Sarcobatus vermiculatus*), and horsebrush (*Tetradymia* sp.). The herbaceous layer is generally sparse and comprised of Indian ricegrass (*Achnatherum hymenoides*), desert needlegrass (*Achnatherum speciosum*), Thurber's needlegrass (*Achnatherum thurberianum*), squirreltail (*Elymus elymoides*), or Sandberg bluegrass (*Poa secunda*).

Inter-Mountain Basins Big Sagebrush Shrubland

This ecological system typically occurs in broad basins between mountain ranges, plains, and foothills between 1,500 and 2,300 meters (4,920 to 7,550 feet) AMSL. Soils are typically deep, well-drained and non-saline. These shrublands are dominated by basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*) and/or Wyoming big sagebrush. Other shrub species may co-dominate in disturbed stands, such as rubber rabbitbrush (*Ericameria nauseosa*), yellow rabbitbrush, antelope bitterbrush, and mountain snowberry (*Symphoricarpos oreophilus*). Common herbaceous species include Indian ricegrass, Idaho fescue, needle and thread, basin wildrye, western wheatgrass (*Pascopyrum smithii*), Sandberg bluegrass, and bluebunch wheatgrass.

Inter-Mountain Basins Curl-leaf Mountain Mahogany Woodland and Shrubland

This ecological system occurs on rocky outcrops or escarpments and forms small to large patch stands at 600 to 2,650 meters (1,970 to 8,700 feet) AMSL. Most stands occur as shrublands on ridges and steep rimrock slopes, but may also be composed of small trees in steppe areas. This community is dominated by curl-leaf mountain mahogany. The understory is typically sparse with common understory shrubs including mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and antelope bitterbrush. Herbaceous species generally included bluebunch wheatgrass and Idaho fescue.

Inter-Mountain Basins Mixed Salt Desert Scrub

This ecological system typically occurs between 1,520 and 2,200 meters (5,000 to 7,200 feet) AMSL, on all aspects, in valley bottoms, alluvial and alkaline flats, mesas, plateaus, playas, drainage terraces, washes, interdune basins, bluffs, and sandy or rocky slopes. This community is dominated by saltbushes (*Atriplex* sp.). Other shrubs commonly present or co-dominants in this community include Wyoming big sagebrush, yellow rabbitbrush, rubber rabbitbrush, Nevada jointfir (*Ephedra nevadensis*), spiny hopsage, winterfat (*Krascheninnikovia lanata*), bud sagebrush, or horsebrush. The herbaceous layer can be sparse to moderately dense with species such as Indian ricegrass, western wheatgrass, Sandberg bluegrass, alkali sacaton (*Sporobolus airoides*), thickspike wheatgrass (*Elymus lanceolatus* ssp. *lanceolatus*), James' galleta (*Pleuraphis jamesii*), and big galleta (*Pleuraphis rigida*).

Inter-Mountain Basins Montane Riparian Systems

This ecological system is found at higher elevations in mountain ranges between 1,220 to over 2,135 meters (4,000 to 7,000 feet) AMSL. This community often occurs as a mosaic of multiple communities that are reflective of the elevation, stream gradient, floodplain width, and flooding events. Important tree species include white fir (*Abies concolor*), Douglas fir (*Pseudotsuga menziesii*), gray alder (*Alnus incana*), water birch (*Betula occidentalis*), narrowleaf cottonwood (*Populus angustifolia*), Fremont's cottonwood (*Populus fremontii*), black cottonwood (*Populus*

balsamifera ssp. *trichocarpa*), white alder (*Alnus rhombifolia*), quaking aspen (*Populus tremuloides*), netleaf hackberry (*Celtis laevigata* var. *reticulata*), or Ponderosa pine (*Pinus ponderosa*). The shrub component can include a variety of species, such as Saskatoon serviceberry (*Amelanchier alnifolia*), silver sagebrush (*Artemisia cana*), redosier dogwood (*Cornus sericea*), black hawthorn (*Crataegus douglasii*), chokecherry (*Prunus virginiana*), Woods' rose (*Rosa woodsii*), Nootka rose (*Rosa nutkana*), various willow species (*Salix* sp.), and common snowberry (*Symphoricarpos albus*). The herbaceous layer is often dominated by a variety of sedges (*Carex* sp.), rushes (*Juncus* sp.), perennial grasses, and mesic forbs. Introduced forage and weedy species are often present in disturbed communities.

Inter-Mountain Basins Montane Sagebrush Steppe

This ecological system occurs on deep-soiled to stony flats, ridges, nearly flat ridgetops, and mountain slopes. This site is generally characterized by mild topography, fine textured soils, some source of subsurface soil moisture or mesic areas, zones of higher precipitation, and areas of snow accumulation. The community is composed of mainly mountain big sagebrush and silver sagebrush. Antelope bitterbrush may co-dominate or dominate some stands. Other shrubs typical within the community include snowberry, serviceberry (*Amelanchier* sp.), rubber rabbitbrush, wax currant (*Ribes cereum*), wild crab apple (*Peraphyllum ramosissimum*), and yellow rabbitbrush. Common graminoids include Idaho fescue, needle and thread, timber oatgrass (*Danthonia intermedia*), muttongrass (*Poa fendleriana*), Sandberg bluegrass, bluebunch wheatgrass, slender wheatgrass (*Elymus trachycaulus*), California brome (*Bromus carinatus*), needlegrass (*Achnatherum* sp.), spike fescue (*Leucopoa kingii*), and tufted hairgrass (*Deschampsia cespitosa*).

Inter-Mountain Basins Semi-Desert Grassland

This ecological system occurs on xeric sites between 1,450 and 2,320 meters (4,750 to 7,600 feet) AMSL, on swales, playas, mesas, alluvial flats, and plains. Dominant or co-dominant species are Indian ricegrass, threeawn (*Aristida* sp.), needle and thread, muhly (*Muhlenbergia* sp.), blue grama (*Bouteloua gracilis*), or James' galleta. Scattered shrubs are often present, and may include basin big sagebrush, Wyoming big sagebrush, saltbush, jointfir, coleogyne (*Coleogyne* sp.), broom snakeweed (*Gutierrezia sarothrae*), and winterfat.

Inter-Mountain Basins Semi-Desert Shrub-Steppe

This ecological system typically occurs at lower elevations on alluvial fans and flats with moderate to deep soils. This community is typically dominated by graminoids with an open shrub to moderately dense woody layer. Characteristic grasses include bluebunch wheatgrass, Indian ricegrass, blue grama, saltgrass, muttongrass, Sandberg bluegrass, alkali sacaton, needle and thread, James' galleta, and saline wildrye (*Leymus salinus*). Common shrub species are

shadscale saltbush, big sagebrush, yellow sagebrush, Greene's rabbitbrush (*Chrysothamnus Greenei*), jointfir, rubber rabbitbrush, broom snakeweed, and winterfat.

Inter-Mountain Basins Sparsely Vegetated Systems

This ecological system is comprised of cliff faces, narrow canyons, open tablelands, saline playas, eroded badlands, and active inland dunes. Vegetation is characterized by sparse cover of various species of trees, shrubs, forbs, and grasses.

Inter-Mountain Basins Subalpine Limber-Bristlecone Pine Woodland

This ecological system occurs on high-elevation ridges and rocky slopes above subalpine forest and woodlands. This site can be found on all aspects, but are more common on southwestern exposures on steep convex slopes and ridges between 2,530 and 3,600 meters (8,300 to 12,000 feet) AMSL. Stands are dominated by limber pine (*Pinus flexilis*) and bristlecone pine (*Pinus longaeva*). If present, the shrub and herbaceous layers are generally sparse and composed of xeric shrubs, graminoids, and cushion plants.

Rocky Mountain Aspen Forest and Woodland

This ecological system occurs between 1,525 and 3,050 meters (5,000 to 10,000 feet) AMSL and is limited by adequate soil moisture required to meet its high evapotranspiration demand and the length of the growing season or low temperatures. Stands are dominated by quaking aspen and have a general absence of conifer species. The understory may be complex with multiple shrub and herbaceous layers or simple with just an herbaceous layer.

Southern Rocky Mountain Mesic Montane Mixed Conifer Forest and Woodland

This ecological system occurs in cool ravines and on north-facing slopes from 1,200 to 3,300 meters (3,940 to 10,825 feet) AMSL. Douglas fir and white fir are the most common dominant tree species, but Engelmann's spruce (*Picea engelmannii*), blue spruce (*Picea pungens*), and Ponderosa pine may also be present. A variety of shrub and grass species are present in the tree understory.

3.17.2 Direct and Indirect Effects of Proposed Action

Under the Proposed Action, approximately 13,000 to 14,900 acres would receive vegetation treatment; although, additional treatment (hand thinning) may occur in Phase I woodlands outside of the treatment unit boundaries. All of the treatment units have preferred treatment methods for different phases of woodland succession, although the actual treatment method may change depending on budgetary constraints and site conditions at the time of treatment application. However, with the abundance of pinyon-juniper vegetation in the surrounding area the overall direct and indirect effects to the vegetation resources under the Proposed Action would be expected to be minor and short-term and long-term. The magnitude of the effects

would depend on the treatment method used and the condition of the vegetation community prior to treatment. Hand thinning, greenwood/fuelwood harvest, prescribed fire, and seeding would be used in conjunction with or in addition to the mechanical treatments (described below).

Mechanical Treatments

The mechanical treatments would result in a long-term reduction of pinyon-juniper vegetation within the Project Area. Pinyon-juniper vegetation is abundant in the surrounding area and not all pinyon-juniper vegetation would be removed within the Project Area. Additionally, sagebrush and other herbaceous species should increase after treatment of the pinyon and juniper trees. Accordingly, impacts of mechanical treatments to pinyon-juniper vegetation would be long-term and minor.

The required use of heavy equipment to conduct mechanical treatments may also result in crushing or removal of some amount of shrubs and herbaceous plants within the treatment units. However, shrub and herbaceous species response should occur within one to three years following treatment. Thus, impacts from inadvertent loss of shrubs and herbaceous plants from mechanical treatments would be short-term and negligible.

Direct and indirect effects to each of the possible mechanical treatments are discussed below.

Chaining

Anchor chains are primarily used to uproot trees and shrubs, create seedbeds, and to cover seed (Stevens, 1999). Chaining can be used to manipulate a community without disrupting the understory vegetation (Stevens, 1999). Understory species response was greatest in big sagebrush communities after treatment of pinyon and juniper trees with the Ely chain (Cain, 1972). Success in removing trees and shrubs varies with species composition, age structure, density, and rooting habit (Stevens, 1999). For example, when chaining, older juniper trees are killed more effectively than the more flexible, young pinyon trees (Stevens, 1999). When comparing the Ely chain to a smooth chain, the Ely chain is more effective at seedbed preparation, and removes more trees and shrubs (Stevens, 1999). Also, the selectivity of chaining varies with application season: winter chaining generally results in removal of trees and some shrubs, growing season chaining would leave more shrubs intact, and late growing season chaining (after soil moisture has been depleted) results in more complete uprooting of trees (Stevens, 1999). Additionally, chaining does not degrade soil and watershed resources when treatment is successful (Stevens, 1999).

Chaining is a more selective treatment method than fire and leaves a diversity of species and age-classes on the site. The slash and debris left from the chaining treatment can improve seedling establishment, while also increasing water infiltration and reducing run-off and erosion.

However, slash can also be piled and prescription burned at a later date to reduce fuel loads and decrease the risk of fire. Therefore, overall impacts from chaining would be minor and long-term.

Mastication and Other Mechanical Treatments

Mastication, or selective cutting (e.g., feller buncher), requires the use of heavy equipment. These treatment methods are more selective than chaining, because trees are felled, mulched, or masticated individually rather than in a swath. Some understory vegetation would be impacted by the use of wheeled or tracked equipment during the application of this treatment method. However, the crushing and trampling impacts of the equipment on vegetation survival would be negligible and temporary or short-term. Tree removal would allow understory species composition to improve by reducing competition with trees, thus increasing vegetation diversity.

Mastication is used to restore desirable vegetation and reduce the risk of catastrophic wildland fire (Young et al., 2013a). Mastication grinds and chips or shreds trees to remove tree cover and compact fuel loads (Tausch and Hood, 2007). Design features would require mulch or biomass from mastication to be less than six inches in depth. The mulch or biomass left on site after treatment can increase infiltration and decrease soil erosion (Cline et al., 2010), especially in areas where bare interspaces were present in the understory. Mastication also increases the time that soil water is available in the spring, which increases understory growth and recovery (Roundy, 2013; Young et al., 2013b). The mulch layer provides safe sites for seedling establishment, while decomposition of the mulch improves soil nutrients over time.

Feller-bunchers cut and lay groups of trees on the ground (Tausch et al., 2009). One benefit to the feller buncher treatment is that soil surface disturbance is usually minimal on dry soils (Tausch et al., 2009) and the "bunched" trees can be left in place to degrade or burned, scattered, or utilized for biomass. Design features would require felled trees to be limbed when trees are to be left on site to promote decomposition and reduce visual obstruction.

Hand-Thinning

Hand-thinning, or chainsaw cutting, is expected to have negligible long-term direct effects on the vegetation resources. This treatment method is primarily targeted for Phase I areas. Hand-thinning would also be used to create desirable edge effects for less selective treatments (e.g., chaining). Hand-thinning creates minimal soil disturbance (Tausch et al., 2009), while selectively removing established pinyon and juniper trees from sagebrush communities. Hand-thinning generally maintains and usually increases the vigor of non-sprouting shrubs, like sagebrush (Tausch et al., 2009), and would be anticipated to have negligible, short-term impacts to the shrub and herbaceous community.

Prescribed Fire

Prescribed fire is used to control woody species, increase herbaceous productivity, enhance forage quality and palatability, and prepare sites for seeding. The prescribed fire treatment is expected to have minor, short-term impacts to vegetation by causing plant mortality and removing the above ground biomass. Understory productivity may decrease the first year following the burn, but is expected to increase thereafter. The prescribed fire treatment is intended to improve the overall health of the vegetation community and increase diversity and resilience, though community recovery may take several years after the treatment.

The prescribed fire treatment is targeted for use in Phase I or II woodlands in established sagebrush communities within the Project Area. Tausch et al. (2009) suggest that sites in Phase I and II can have desirable understory response from prescribed fire, especially when perennial native species are still present in the understory. Prescribed fire can be difficult to carry through late Phase II and Phase III woodlands due to lack of ground and ladder fuels (Tausch et al., 2009), which is when a treatment method may be necessary prior to burning (e.g., hand thinning). Prescribed fire can also increase weeds after treatment, therefore this method would not be used in areas where cheatgrass cover is at a level where it would be expected to increase or dominate after treatment. The Interdisciplinary Team would determine when prescribed fire could be used, based on the understory present at the time of treatment.

When prescribed burning is used for pile or slash burning to reduce fuels and decrease wildland fire risk, direct effects are anticipated to be minor and temporary. The slash piles are relatively small in comparison to the treatment unit, and burning usually occurs with snow on the ground or after rainfall, therefore the effects would be negligible at the landscape level.

Greenwood/Fuelwood Harvest

Treatment areas may be open to public greenwood harvest pre-treatment or for fuelwood harvest post-treatment. Short-term impacts to vegetation resources would be negligible, but similar to those described for hand-thinning. Design features would restrict and control accessibility and timing of these harvests to minimize any impacts on the vegetation resources and treatment success.

Seeding

The seeding treatments are expected to have negligible impacts to the vegetation communities. Seeding is a preferred treatment method to be used in conjunction with tree removal treatments when the understory species present on site are not at levels adequate to respond naturally. Additionally, seeding treatments can be used in areas where weed invasion is likely or weed suppression is desirable. Seeding treatments would have no impacts relating to reduction in native plant populations within existing vegetation communities, especially when aerial

application is used. Some negligible, temporary impacts to existing vegetation may occur if tractors, ATVs or other equipment are used to apply seed.

3.17.3 Direct and Indirect Effects of No Action Alternative

Under the No Action Alternative, no changes in management would occur and direct impacts would not occur. The No Action Alternative would have minor long-term indirect effects on the vegetation resources. Sagebrush communities within the treatment units would continue to decrease as pinyon and juniper continues to increase. The acreages of succession classes D, E, and UN would increase within the Project Area, while succession classes A, B, and C would decline. A decline of these succession class would not comply with the goals and management directions described in the Ely RMP and the LRMP. Although no direct effects would occur from the No Action Alternative, the indirect effects would not improve vegetation diversity or ecosystem resistance and resilience.

3.18 VISUAL RESOURCES

Information presented below was summarized from the *Specialist Report, Visual Resources, Overland Pass Habitat Improvement Project* (JBR, 2014b).

3.18.1 Affected Environment

The direct and indirect effects to visual resources were assessed using a contrast analysis based on the BLM VRM System and the USFS Scenery Management System (SMS). BLM VRM classes provide objectives that identify various permissible levels of landscape alteration while protecting the overall visual quality of the region. The VRM classes that have been designated for the BLM-administered public land within the Project Area include Class II, Class III, and Class IV. The SMS uses a similar set of objectives, referred to as SIOs. The SIOs that have been designated for the NFS land within the Project Area include “Moderate”, “High”, and “Very High”.

The objectives and descriptions of the VRM classes and SIOs designated for the Project Area are presented in Table 3.18-1. The table is arranged such that each VRM class can be translated to its roughly equivalent SIO, and vice versa. VRM Class III and Class IV are roughly equivalent to SIOs that do not occur within the Project Area, but are presented in Table 3.18-1 for informational and comparison purposes.

Table 3.18-1 USFS Scenic Integrity Objectives and BLM Visual Resource Management Class Equivalents

USFS Scenic Integrity Objective	Scenic Integrity Objective Description/Characteristics	BLM Visual Resource Management Class	Visual Resource Management Class Description/Characteristics
Very High. (unaltered, preservation)	Landscapes where 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.	I	The objective of this class is to preserve the existing character of the landscape. The level of change to the characteristic landscape should be very low and should not attract attention.
High (appears unaltered, retention)	Landscapes where the valued 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.	I to II, depending on existing landscape character	-
Moderate (slightly altered, partial retention)	Landscapes where the valued landscape character "appears slightly altered." Noticeable deviations must remain visually subordinate to the landscape character being viewed.	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.
Low (moderately altered, modification)	Landscapes where the valued landscape character "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, vegetative type changes or architectural styles outside the landscape being viewed. They should not only appear as valued character outside the landscape being viewed but compatible or complimentary to the character within.	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.

USFS Scenic Integrity Objective	Scenic Integrity Objective Description/Characteristics	BLM Visual Resource Management Class	Visual Resource Management Class Description/Characteristics
Very Low (heavily altered, maximum modification)	Landscapes where the valued landscape character "appears heavily altered." Deviations may strongly dominate the valued landscape character. They may not borrow from valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes or architectural styles within or outside the landscape being viewed. However deviations must be shaped and blended with the natural terrain (landforms) so that elements such as unnatural edges, roads, landings, and structures do not dominate the composition.	IV	The objective of this class is to provide for management activities that require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements of the landscape.

Sources: (BLM, 1986; USFS, 1982)

Table 3.18-2 presents the approximate acres of BLM VRM classes and USFS SIOs within each treatment unit. These VRM and SIO classes are also shown on Figure 3.12-1.

Table 3.18-2 Existing Visual Resource Management Classes and Scenic Integrity Objective Levels for the Treatment Units

Treatment Unit	Total Acres*	BLM-Administered Public Land		NFS Land		Private Land
		VRM Class	Acres	SIO	Acres	Acres
Willow Creek	751	III	<1	Moderate	749	1
Lower East Bench	697	II	297	Moderate	273	-
		III	127	-	-	-
East Bench	1,560	II	312	Moderate	1,054	-
		III	194	-	-	-
Cracker Johnson	1,848	II	754	-	-	25
		III	538	-	-	-
		IV	531	-	-	-
East Sherman	813	-	-	Very High	239	-
		-	-	High	92	-
		-	-	Moderate	482	-
Walker Canyon	641	-	-	Moderate	546	95
Big Wash	4323	II	1,500	Moderate	2,784	-
		IV	39	-	-	-
North Cherry	2,094	-	-	Moderate	2,094	-
Sestanovich	213	-	-	Moderate	<1	213
Overland Pass	5,631	II	1,387	Moderate	1403	-
		III	2,841	-	-	-
Total	18,571	-	8,521	-	9,716	334

*Total acres do not necessarily equal the sum of BLM administered public land, NFS land, and private land because some VRM and SIO classification acreages overlap.

The BLM VRM system and the USFS SMS both rely on measuring or quantifying the degree of visual contrast that a project would have with the existing landscape to determine whether the project conforms to the applicable VRM class objectives or SIO. The degree of contrast is measured by comparing the major features of the project with the major features of the landscape. The basic design elements of form, line, color, and texture are used for the comparison of features and to describe the visual contrast created by a project. The contrast analysis is conducted from one or more KOPs, which are locations with critical views of a project or locations providing typical views encountered in the landscape (BLM, 1986). Typically, KOPs are selected along well-used roadways and trails, recreation sites, and near communities, as these are areas where the greatest number of people would see a project for the longest period of time.

The following KOPs were selected for the visual resources analysis presented in this EA:

- KOP 1 – Fort Ruby;
- KOP 2 – Hastings Cutoff of the California Trail/Ruby Valley Road;
- KOP 3 – Overland Pass Summit;
- KOP 4 – Jiggs Highway/Pony Express Trail;
- KOP 5 – Jiggs Highway/NF-381; and
- KOP 6 – Jiggs Highway.

The locations of the KOPs are displayed on Figure 3.12-1. Photographs of the existing landscape viewed from each of the KOPs are provided in Appendix G. A complete and detailed description of the existing landscape from each KOP is provided in the *Specialist Report, Visual Resources, Overland Pass Habitat Improvement Project* (JBR, 2014b).

In general the existing landscapes visible from most locations within the Project Area or from the immediately surrounding area (generally within 0.5 mile) can be described as typical of northeast Nevada. Views within interior portions of the Project Area are generally characterized by steep mountains and narrow ravines or canyons between ridges. Mountains and steep ravines are generally covered with vegetation consisting of conifer trees and mixed xeric shrubs, typical of mountains in the Basin and Range Province. Steep mountainous topography gives way to gentle rolling alluvial fans and nearly flat valley floors at the eastern and western boundaries of the Project Area. Vegetation cover in the alluvial fans and valley floors is characterized by low scattered shrubs. There are several groundwater springs scattered throughout the Project Area, and vegetation cover at these springs consists of riparian species, which are generally visually apparent against the backdrop of upland xeric shrubs.

Many views from within the Project Area and immediately surrounding area include human modifications and other alterations to the natural landscape. Roads and trails, including Overland Pass, are the most predominant landscape modification in the area. Other modifications and alterations include fences and other range improvements, wildland fire, surface disturbance related to mining, and management controls, such as interpretative information signage at landmarks. As shown on Figure 3.12-1, most KOPs are located along roads and trails because most visual receptors would be expected to occur in association with travel or recreation on roads and trails.

3.18.2 Direct and Indirect Effects of Proposed Action

Project equipment and crews would create temporary visual contrast during implementation of the treatment activities, regardless of the KOP from which they are viewed. Vegetation cover would be expected to partially shield views of equipment and crews from all of the KOPs during most of the Project implementation. Following implementation, equipment and crews would be removed from the Project Area. The impacts of the contrast created by the Project equipment and crews would be temporary and negligible.

The short-term and long-term impacts anticipated from the contrast created by changes to the vegetation communities and surface disturbance associated with the treatments would vary by KOP. These impacts are discussed separately for each KOP below.

KOP 1 – Fort Ruby

The treatment units visible from KOP 1 include East Bench and Lower East Bench to the northwest and west, and Overland Pass to the south. The East Bench, Lower East Bench, and Overland Pass treatment units include BLM-administered public lands that are designated as VRM Class II and III, and NFS lands with a SIO designation of Moderate.

The removal of pinyon and juniper trees within the East Bench and Lower East Bench treatment units would create additional breaks between woodland communities and shrub communities. Roughly horizontal lines would be created where these communities converge. The vertical lines would appear soft and faint because they would mimic similar vertical lines from natural vegetation breaks in the existing landscape. Vertical lines associated with trunks of individual trees would be slightly more pronounced after treatments because of the reduced tree density. The tall, rugged forms and lines of the mountains west of the treatment units would become more prominent from KOP 1 following removal of pinyon and juniper trees.

Felled trees left within the East Bench and Lower East Bench treatment units would increase the occurrence of irregular horizontal to near-horizontal lines. Scattered trees from hand thinning, mulch chips from mastication, and root wads from chaining would add coarse textures to the

units. Textures would become less coarse and eventually diminish entirely as scattered trees, mulch chips and root wads naturally decompose. The color of the vegetation would become slightly more gray-green as sagebrush establishes within both treatment units. Biomass material would increase the brown and tan hues within the treatment units as it decomposes.

The Overland Pass treatment unit is located approximately two miles south of KOP 1. At this distance, any visual contrast between the form, line, color and texture elements of the existing landscape and the Proposed Action would be indiscernible.

Implementation of the Proposed Action would result in weak visual contrast with the existing landscape because it would repeat form, line, color, and texture elements typical of the landscape features. The visual modifications resulting from the Project would not dominate the landscape character, and the level of change within the landscape would be low. Most contrast and changes would be expected to dissipate within the first 10 years following implementation of the treatments. Thus, the Proposed Action would have negligible short-term impacts on visual resources from KOP 1, and no long-term impacts. The Proposed Action would not conflict with the objectives of VRM Class II or Class III, or the landscape characteristics for the Moderate SIO (Table 3.18-1).

KOP 2 – Hastings Cutoff of the California Trail/Ruby Valley Road

The treatment units that would be visible from KOP 2 include East Bench and Lower East Bench to the northwest, west, and southwest, and Overland Pass to the south. The East Bench, Lower East Bench, and Overland Pass treatment units include BLM-administered public lands that are designated as VRM Class II and III, and NFS lands designated as Moderate SIO.

The visual contrast created by the proposed treatments within the East Bench and Lower East Bench treatment units would be the same as described for KOP 1. KOP 2 is located closer to the Overland Pass treatment unit than is KOP 1, and the visual contrast created by treatments within this unit would be somewhat discernible. However, the Overland Pass treatment unit is still more than approximately one mile from KOP 2, and any changes to form, line, and texture elements would be less prominent than changes within the East Bench or Lower East Bench treatment units. Removal of pinyon-juniper woodland may expose mineral soil and rock outcroppings, which would increase the abundance of tan and gray colors. A reduction of dark green colors from the removal of pinyon-juniper woodland would be slightly noticeable from KOP 2. Likewise, gray-green colors would become more abundant as sagebrush establishes within the treatment unit. There would be no noticeable changes in texture within Overland Pass treatment unit.

Implementation of the Proposed Action would result in weak visual contrast because it would repeat form, line, color, and texture elements typical of existing landscape features. Visual modifications resulting from the Project would not dominate the landscape character, and the level of change within the landscape would be low. Nearly all visual contrast and changes would be expected to dissipate within 10 years of implementation of the treatments. Thus, the Proposed Action would have negligible short-term impacts on visual resources from KOP 2, and no long-term impacts. The Proposed Action would not conflict with the objectives of either VRM class or the Moderate SIO (Table 3.18-1).

KOP 3 – Overland Pass Summit

The Overland Pass treatment unit is the only unit that would be visible from KOP 3. BLM-administered public lands within the treatment units are designated as VRM Class II and III, and NFS lands are designated as Moderate SIO.

Because the Overland Pass treatment unit is roughly the same distance from KOP 3 as the East Bench and Lower East Bench treatment units are from KOP 1 and KOP 2, and because this analysis assumes all of the treatments may occur within each of the units, the visual contrast anticipated from KOP 3 would be the same as described from KOP 1 and KOP 2. Accordingly, implementation of the Proposed Action would have short-term negligible impacts on visual resources and no long-term impacts. The Proposed Action would not conflict with the objectives of VRM Class II or Class III or the objectives and landscape characteristics of Moderate SIO.

KOP 4 – Jiggs Highway/Pony Express Trail

The Big Wash treatment unit is the only unit that would be visible from KOP 4. BLM-administered public lands within the treatment unit are designated as VRM Class II and III, and NFS lands are designated as Moderate SIO.

The removal of pinyon and juniper trees within the Big Wash treatment unit would create additional breaks between woodland communities and shrub communities. Roughly horizontal lines would be created where these communities converge. The vertical lines would appear soft and faint because they would mimic similar vertical lines from natural vegetation breaks in the existing landscape. Vertical lines associated with the trunks of individual trees would be slightly more discernible after treatments because of the reduced tree density. The reduced tree density would also allow for more visibility of mineral soils and rock outcroppings, which would add tan and gray colors to the landscape.

Felled trees left within the treatment unit would increase the occurrence of irregular horizontal to near-horizontal lines. Biomass material would add brown and tan colors as it decomposes. Textures associated with felled trees and biomass material would generally not be visible from

the KOP because of its distance from the treatment unit. Dark green colors associated with pinyon-juniper woodland would be reduced within the treatment area. However, as sagebrush becomes established, gray-green colors would be added to the landscape.

The Proposed Action would have weak visual contrast with the existing landscape because the form, line, and color elements associated with the proposed treatments would occur more than one mile from the KOP and would generally be repetitive of elements typical of the existing landscape features. Texture elements would not be discernible. Visual modifications would not dominate the landscape character, and the level of change would be low. Visual contrast and changes would be expected to dissipate within 10 years. Thus, implementation of the Proposed Action would have short-term negligible impacts on visual resources, and no long-term impacts. The Proposed Action would not conflict with the objectives of VRM Class II or III or the objectives and landscape characteristics of Moderate SIO (Table 3.18-1).

KOP 5 – Jiggs Highway/NF-381

The treatment units that would be visible from KOP 5 include the North Cherry and Walker Canyon units. Both treatment units are located on NFS lands designated as Moderate SIO.

The North Cherry treatment unit is approximately the same distance from KOP 5 as the Big Wash treatment unit is from KOP 4. Accordingly, the visual contrast that the Proposed Action would have within the North Cherry treatment unit would be approximately the same as described within the Big Wash unit for KOP 4.

The Walker Canyon treatment unit is located approximately two miles northeast of KOP 5. At this distance, any visual contrast between line and texture elements of the existing landscape and the Proposed Action would be indiscernible. Removal of pinyon-juniper vegetation would reduce the amount of dark green colors within the treatment unit. However, as sagebrush becomes established, gray-green colors would be added to the landscape. Variations in the hues of greens that would be visible would create the impression of large, irregular shaped forms. These forms would generally repeat the irregular shaped forms created by subtle changes in colors among the existing sagebrush cover and pinyon-juniper woodland within the existing landscape.

Changes to the landscape from the Proposed Action would be low and not dominate or affect its character. Visual contrast and changes would be expected to dissipate within 10 years of the treatments. Impacts on visual resources resulting from implementation of the Proposed Action would be short-term and negligible from KOP 5. There would be no long-term impacts anticipated from the Proposed Action. The Proposed Action would not conflict with the objectives and landscape characteristics of Moderate SIO.

KOP 6 – Jiggs Highway

The treatment units that would be visible from KOP 6 include the Willow Creek, Walker Canyon, North Cherry, and Sestanovich units. The treatment units are located on NFS lands designated as Moderate SIO.

The removal of pinyon and juniper trees within the Willow Creek and Walker Canyon treatment units would create additional breaks between woodland communities and shrub communities. Roughly horizontal lines would be created where these communities converge. The vertical lines would appear soft and faint because they would mimic similar vertical lines from natural vegetation breaks in the existing landscape. Vertical lines associated with trunks of individual trees would be slightly more pronounced after treatments because of the reduced tree density. However, trees in the eastern extents of the treatment units would continue to appear as large masses of woodland because of their distance from KOP 6. The tall, rugged forms and lines of the mountains east of the Willow Creek and Walker Canyon treatment units would become more prominent from KOP 6 following removal of pinyon and juniper trees.

Felled trees left within the treatment unit would increase the occurrence of irregular horizontal to near-horizontal lines. Biomass material would add brown and tan colors as it decomposes. Textures associated with felled trees and biomass material would generally not be visible from the KOP because of its distance from the Willow Creek and Walker Canyon treatment units. Removal of pinyon-juniper vegetation would reduce the amount of medium to dark green colors within the Willow Creek and Walker Canyon treatment units. However, as sagebrush becomes established, gray-green colors would be added to the landscape. Contrast from color elements would be negligible and generally dissipate with distance from the KOP.

The portions of the North Cherry and Sestanovich treatment units that would be visible from KOP 6 would be approximately two miles away or farther. At this distance, any visual contrast between line and texture elements of the existing landscape and the Proposed Action would be indiscernible. Removal of pinyon-juniper vegetation would reduce the amount of dark green colors within the treatment unit. However, as sagebrush becomes established, gray-green colors would be added to the landscape. Variations in the hues of greens that would be visible would create the impression of large, irregular shaped forms. These forms would generally repeat the irregular shaped forms created by subtle changes in colors among the existing sagebrush cover and pinyon-juniper woodland within the existing landscape.

Because contrast would be weak and visual changes from implementation of the Project would be expected to dissipate within 10 years of the treatments, impacts on visual resources from the Proposed Action would be negligible and short-term. Long-term impacts would not be expected.

The Proposed Action would not conflict with the objectives and landscape characteristics of Moderate SIO.

3.18.3 Direct and Indirect Effects of No Action Alternative

Under the No Action Alternative, elements (i.e., form, line, color, and texture) of the existing vegetative character would remain the same as what's described for the existing environment for each of the KOPs. Over time, natural succession would result in continued establishment of pinyon and juniper, and the continued decline of herbaceous vegetation in the understory of the trees. Also, pinyon and juniper trees would continue to establish in sagebrush dominated communities and increase in density where already established. The form, line, color, and texture elements associated with pinyon-juniper woodland would become more prominent in the landscape from all of the KOPs. Considering the pinyon-juniper woodland is a component of the existing landscape from each KOP, and continued establishment of pinyon-juniper woodland is a natural process, visual contrast would be negligible in the short-term and the long-term.

3.19 WILD HORSES

3.19.1 Affected Environment

The analysis area for impacts to wild horses includes the Project Area. This area was chosen because it represents the area in which impacts to wild horses would be limited.

The Project Area occurs in the northwest portion of the Triple B Herd Management Area (HMA) and is centered within the Cherry Springs Wild Horse Territory (WHT) (Figure 3.19-1). The 2008 Ely RMP (BLM, 2008b) combined three HMAs (Buck and Bald HMA, Butte HMA, and Cherry Creek HMA) into the Triple B HMA (approximately 1,255,000 acres). The decision to combine all or portions of the three HMAs was due to the historical interchange of wild horses between the three HMAs and was based on an in-depth analysis of habitat suitability and monitoring data as set forth in the *Ely Proposed Resource Management Plan/Final Environmental Impact Statement* (BLM, 2007a). The 2007 EIS evaluated each HMA for five essential habitat components and herd characteristics: forage, water, cover, space, and reproductive viability. Through this analysis and the subsequent ROD and approved RMP (BLM, 2008b), the boundaries were established to ensure sufficient habitat for wild horses, and an Appropriate Management Level (AML) was reviewed and set that would achieve a thriving natural ecological balance and rangeland health. The Cherry Springs WHT (approximately 23,794 acres) established an AML through the Cherry Springs WHT Management Plan (USFS, 1993), which was based on monitoring data and wild horse seasonal movement within the Cherry Springs WHT. The Triple B HMA is located in the southeast portion of the Project Area and is managed by the BLM Ely District Office. The Cherry Springs WHT is centered around the Project Area in Elko County and is managed by USFS Ruby Mountains Ranger District.

Movement of horses between the Triple B HMA and Cherry Springs WHT is seasonally motivated. Fences do exist within the Triple B HMA, but do not restrict wild horse movement due to the fact that the fences are open at the end. The range of the horses is limited by availability of forage and water. During summer months and dry years, water resources become very limited within the HMA and WHT. As water resources become limited, wild horses tend to concentrate around the water sources. The wild horse population within the Triple B HMA and Cherry Springs WHT generally summer at higher elevations and move down to the valleys during the winter months. Table 3.19-1 describes the estimated population levels and AML for each herd area.

Table 3.19-1 Wild Horse Population and Appropriate Management Levels

Herd	Estimated Population*	Appropriate Management Level**
Triple B HMA	1,311	250-518
Cherry Springs WHT	43	40-68

*Population estimates from 2014 BLM/USFS Flight Inventory.

** (BLM, 2011)

3.19.2 Direct and Indirect Effects of Proposed Action

Approximately 8,244 acres of the Triple B HMA and 6,457 acres of the Cherry Springs WHT are within treatment units and would be impacted by the Proposed Action. Removal of pinyon-juniper woodland would stimulate early seral species that would be suitable as forage for wild horses. Ground cover, species diversity, and soil stabilization are all expected to increase within the treated areas. Currently, the areas with high dominance of pinyon and juniper are not meeting desired range condition (USFS, 2011a). Ground cover of at least 60 percent is needed for functionality in pinyon-juniper types (USFS, 2005). The majority of Phase III sites are estimated to have less than 40 percent cover; therefore, Phase III woodlands would not be functioning properly.

The Proposed Action would temporarily displace wild horses during implementation of treatment activities. Temporary displacement would have a negligible impact because of the short duration, availability of nearby similar habitat, and because horses would be expected to return following treatment completion. Restoration of Cracker Johnson Spring No. 2 would temporarily displace wild horses during treatment activities; however, water would piped to a trough after treatment providing a constant water source. Fencing of the riparian area would exclude wild horses, though impacts would be negligible because forage is readily available to wild horses throughout the Project Area, the Triple B HMA, and the Cherry Springs WHT. The removal of pinyon-juniper in the Project Area would stimulate forage species, improve the quality, and increase the amount of forage available for wild horses. It would be anticipated that the wild horses would graze the treated area heavier than normal after treatment due to new

growth and an increase in grasses. Increased availability of forage from the Proposed Action would have a negligible long-term impact to the wild horses.

3.19.3 Direct and Indirect Effects of No Action Alternative

Under the No Action Alternative, impacts to wild horses would be negligible. Habitat for wild horses would change with increased pinyon-juniper woodlands, more decadent shrubs and fewer perennial, herbaceous plants for forage. Additionally, there would be increased competition among wildlife, livestock, and wild horses due to limited forage.

3.20 WILDLIFE

Information provided below has been summarized from the *Specialist Report and Biological Evaluation, Wildlife, Overland Pass Habitat Improvement Project* (JBR, 2014f).

3.20.1 Affected Environment

Information regarding any known or potential occurrence of wildlife resources within or near the Project Area was requested from NDOW. The NDOW responded with a letter, GIS data, and a series of maps (NDOW, 2012), focusing on the Project Area and a 3-mile radius for general wildlife. Information regarding migratory birds is provided in Section 3.5 and special status species information is described in Section 3.16. General wildlife information is summarized below.

The NDOW's response letter indicates that pronghorn antelope distribution is present in Ruby and Huntington Valleys in the eastern and western portion of the Project Area and the three mile radius. Elk (*Cervus elaphus*) distribution exists in the Ruby Mountains, extending through the central portions of the Project Area and 3-mile radius. Mule deer distribution exists throughout the entire Project Area and the majority of the 3-mile radius, excluding Ruby Lake in the northeast and Huntington Valley in the southwest.

3.20.2 Direct and Indirect Effects of Proposed Action

Injury or mortality of the big game species (e.g., antelope, elk, mule deer, etc.) and other wildlife species would not be expected as a result of implementing the Proposed Action. If these species were to occur in the treatment unit, it would be expected that they would vacate the unit prior to Project equipment and activities reaching their location. Wildlife that are known to burrow or that may be too slow to avoid equipment or mechanical treatment activities may become subject to mechanical-related mortality. However, the likelihood of this would be minimized by the speed limit restrictions in the Project Area. Additionally, treatments have been designed to occur at times of the year when mechanical related mortality would be at its lowest probability. Accordingly, impacts would be negligible and temporary for the duration of treatment implementation.

Noise and visual disturbances, as well as smoke and dust associated with treatment activities and equipment may cause wildlife and big game avoidance of the treatment units during implementation. Displaced wildlife and big game would likely use similar habitat surrounding the treatment units, which is abundant within relatively close proximity to the Project Area. After implementation, wildlife and big game would be expected to return to the treatment units. Displacement would not be expected to result in wildlife mortality or reduced populations, and impacts would be negligible.

Successful implementation of vegetation treatments would result in a long-term reduction of pinyon-juniper habitat within the treatment units. Concurrently, a long-term increase in sagebrush habitat containing greater amounts of herbaceous species for foraging would occur within the same treatment units. The reduction of pinyon-juniper habitat would be expected to have negligible impacts to wildlife species utilizing this type of habitat because pinyon-juniper habitat is abundant in the surrounding area, and the Proposed Action would not remove all pinyon-juniper habitat from within the Project Area. The long-term increase in desirable herbaceous species and transition to more diverse vegetation cover would improve habitat quality for big game and many wildlife species. Impacts to elk habitat would not be anticipated because they readily utilize pinyon-juniper woodlands, shrub-steppe, and grasslands. Improvement of forage quality and availability after treatment application would likely increase the utilization by elk in the Project Area. Impacts to pronghorn antelope habitat would not be anticipated because they utilize more open sagebrush-steppe areas. Antelope distribution and movement between Ruby and Huntington Valleys may increase in the Overland Pass corridor after treatment due to the reduction of pinyon and juniper trees.

Specifically, the Proposed Action may impact mule deer seasonal movement because some treatment activities would occur within a migration corridor. However, impacts would generally be short-term to temporary and negligible to minor, as habitat quality in the migration corridor would be expected to improve in the long-term with successful vegetation treatments. Impacts associated with the Proposed Action would not result in reducing population viability, existing distribution, or result in a downward trend in habitat capability, primarily because the Project would improve habitat for mule deer.

3.20.3 Direct and Indirect Effects of No Action Alternative

Under the No Action Alternative, sagebrush habitat would continue to decrease as pinyon-juniper habitat continues to establish and increase within the Project Area. The loss of sagebrush habitat would indirectly relate to reduced populations of wildlife species that use open sagebrush habitats and a reduction in mule deer summer and winter habitat within the Project Area. No

direct mortality would occur with the No Action Alternative but the indirect effects could continue to influence the downward trend of the mule deer winter habitat in the Project Area.

4.0 CUMULATIVE EFFECTS

4.1 INTRODUCTION

Cumulative effects (i.e. cumulative impacts) are defined in 40 CFR 1508.7 as “the impact which results from the incremental impact of the action, decision, or project when added to the other past, present, and reasonably foreseeable future actions (RFFA), regardless of what agency (Federal or non-Federal) or person undertakes such actions. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time”. In accordance with this definition, this section addresses the potential cumulative effects that would result from the implementation of the Proposed Action and the No Action Alternative when added to the other past, present, and RFFAs within the cumulative effects study areas (CESA).

These cumulative impacts would include both direct and indirect impacts resulting from the Proposed Action. These impacts are additive and may compound the degree of effect when combined with past, present and RFFAs. The significance of effects was determined based on context (i.e., the setting of the CESAs) and intensity (i.e., severity of the effect). Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment (40 CFR 1508.27(b)(7)). Factors that could be used to define the intensity of effects include the magnitude (relative size or amount of an effect), geographic extent, temporal extent, and frequency of the effects. The Proposed Action would be implemented over a 10-year period, and the majority of adverse impacts would dissipate within several years after implementation. Thus, a temporal extent of 15 years was used for this cumulative effects analysis.

Information utilized in the cumulative impacts assessment was gathered from the following sources: BLM’s Land and Mineral Legacy Rehost 2000 System (LR2000); the Nevada Atlas and Gazetteer; GIS shapefiles provided by the BLM, USFS, and Nevada Bureau of Mines and Geology (NBMG); and aerial photography. The BLM LR2000 database was queried for authorized multiple land use activities, pending ROW grants, mineral and non-mineral exploration, and mining permits. The USFS SOPA was also reviewed for past, present, and RFFAs on NFS land.

Table 4.1-1 lists the analyzed resources, the name and size of each CESA, and the figure number on which the geographic extent of the CESA is shown. Both the Proposed Action and No Action Alternative would have negligible impacts on air quality, cultural resources, human health and safety, Native American religious concerns, water quality, climate change, inventoried roadless areas, NHTs, and wild horses; therefore, cumulative effects to these resources would not be expected and these resources have not been carried through the cumulate analysis section. Actions are defined for the cumulative analysis in this EA as projects or other activities that could interact with the Proposed Action or No Action Alternative in a manner that would result

in a cumulative increase in impacts. Actions have been grouped as past, present, and RFFAs. The term “overall CESA boundary” is used in this section, which is defined as the total boundary of all the CESAs combined. The overall CESA boundary is the same boundary as the greater sage-grouse CESA (Figure 4.4-5).

Table 4.1-1 Cumulative Effects Study Areas

Resource	Cumulative Effects Study Areas		
	Acres	Description	Explanation
Non-Native, Invasive and Noxious Species and Vegetation	287,111	Includes the northeastern portion of the Diamond Mountains, southern portion of the Ruby Mountains, southern portion of the Maverick Springs Range, northwestern portion of the Tognini Mountains and Alligator Ridge, and the northern portion of Bald Mountain. (Figure 4.4-1).	This CESA was used because this is the area where vegetation resources have the potential to be affected by Project activities and non-native, invasive and noxious species.
Wetlands, Riparian Zones, Soils, Hydrology,	235,480	Big Wash, Cave Creek-Frontal Ruby Lake, Cherry Canyon, Fort Ruby Spring-Frontal Ruby Lake, Lower Conners Creek, Mill Spring, Sestanovich Creek, Sherman Creek-Huntington Creek, Walker Canyon-Huntington Creek, Woodward's Creek-Frontal Ruby Lake and Ruby Lake watersheds Hydrologic Unit Code (HUC) 12, including the Project Area (Figure 4.4-2).	These watersheds were used as the CESA in order to evaluate potential risk to these watersheds by the Proposed Action, and in order to evaluate past, present, and RFFAs impacts on these watersheds.
Rangeland	598,181	Warm Springs Allotment, Cold Creek Allotment, Cave Creek Allotment, Sherman Creek Allotment, Cherry Springs Allotment, Corta S&G Allotment, Warm Springs Trail Allotment (Figure 4.4-3).	These allotments were used for the CESA boundary because they encompass the Project Area and the permitted range that may be impacted by the Project activities.
Recreation	45,222	Project Boundary, South Ruby Campground, and Fort Ruby Historic Site/Fort Ruby Interpretive Trail (Figure 4.4-4).	This CESA was chosen because this is the area where dispersed recreation opportunities, and access to these recreation opportunities, would most likely be cumulatively impacted by past and present actions and RFFAs when combined with the Project activities. Effects from Project activities on recreation opportunities are unlikely to be cumulatively considerable beyond the CESA boundary.
General Wildlife	45,222	Project Area (Figure 4.4-5).	The Project area was used for the general wildlife CESA because it incorporates habitat within the Project Area where most of the impacts to general wildlife would occur.

Resource	Cumulative Effects Study Areas		
	Acres	Description	Explanation
Big Game	1,447,152	Hunt Units 103, 104, and 108 (Figure 4.4-5).	These hunt units were chosen because these hunt units contain the majority of the Ruby Mountains and surrounding valleys where big game that would be affected by Project activities carry out most of their lifecycle. The majority of migration from winter to summer habitats for big game animals impacted by Project activities occur within these hunt units.
Raptors	515,519	Project Area and a 10-Mile Buffer around the Project Area (Figure 4.4-5).	A 10-mile buffer was used for the raptors CESA because it incorporates habitat within and adjacent to the Project Area where most of the impacts to raptors would occur.
Greater Sage-grouse	6,445,953	Butte/Buck/White Pine, Ruby Valley, South Fork, and Diamond Population Management Units (PMU) (Figure 4.4-5).	These four PMUs were used for the greater sage-grouse CESA because all four bisect the Project Area. These PMUs also take in the area projected by the density and distribution calculation tool (4-mile buffer around the Project Area and around leks).
Visual	277,090	Visible areas within a 10-mile buffer of Project Treatment Units (Figure 4.4-6).	This CESA boundary was chosen because it encompasses the viewshed of the Project as represented by the KOPs, and it is the area where the effects of the Project could be viewed relative to other actions that have impacted or would be anticipated to impact visual resources.

4.2 PAST AND PRESENT ACTIONS

According to the Forest Service Handbook (FSH) 1909.15.1 (USFS, 2010) and the CEQ Guidance Memorandum on Consideration of Past Actions in Cumulative Effects Analysis dated June 24, 2005, CEQ regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions. CEQ regulations do not require agencies to catalogue or exhaustively list and analyze all individual past actions (CEQ, 2005; USFS, 2012c). In compliance with CEQ regulations, only those past actions that have resulted in present impacts were considered in this cumulative effects analysis. The approximate area of

surface disturbance that has resulted in the CESAs from each type of past and present action (e.g., sand and gravel operations, agriculture, railroad, etc.) is presented in Table 4.2-1.

Table 4.2-1 Past, Present, and Reasonably Foreseeable Future Actions for the Overland Pass Project Cumulative Effects Study Areas¹

CESA	Types of Activity												
	Oil, Gas and Geothermal Development ²	Sand and Gravel Operations	Mineral Exploration and Mining Operations	Agriculture ³	Powerlines, Telephone Lines and Communication Facilities	Urban Development ⁴	Public Purpose Sites	ROW-Roads ⁵	Railroad ⁵	Water Facilities and Pipelines	Agency Treatment Projects	Wildland Fires	Total Disturbance (Acres)
Past and Present Actions – Surface Disturbance Acres													
Non-Native, Invasive and Noxious Species and Vegetation Resources	6	53	5,375	521	195	NA	95	1,418	NA	2	36,510	11,407	55,582
Wetlands, Riparian Zones Soils, and Hydrology	6	48	5,154	485	22	78	125	1,156	NA	2	31,592	10,721	49,389
Rangeland Resources	66	566	9,753	261	404	46	121	3,263	NA	16	41,646	9,852	65,994
Recreation	NA	15	75	NA	9	NA	7	188	NA	NA	3,242	1,651	5,187
General Wildlife, Including Migratory Birds, Pygmy Rabbit, and Bat Species	NA	15	75	NA	9	NA	7	188	NA	NA	3,242	1,651	5,187
Big Game	108	1,317	10,082	622	4,038	78	125	8,132	NA	42	33,722	27,014	85,280
Raptors	18	111	8,880	1,055	195	78	125	2,494	NA	5	47,438	32,359	92,758
Greater Sage-grouse	552	10,459	24,580	93,479	15,408	30,259	2,382	46,760	5,274	1,410	53,038	367,152	650,753
Visual Resources	NA	58	2,683	983	195	39	90	1,309	NA	3	31,633	9,164	46,157

CESA	Types of Activity												
	Oil, Gas and Geothermal Development ²	Sand and Gravel Operations	Mineral Exploration and Mining Operations	Agriculture ³	Powerlines, Telephone Lines and Communication Facilities	Urban Development ⁴	Public Purpose Sites	ROW-Roads ⁵	Railroad ⁵	Water Facilities and Pipelines	Agency Treatment Projects	Wildland Fires	Total Disturbance (Acres)
Reasonably Foreseeable Future Actions – Surface Disturbance Acres													
Non-Native, Invasive and Noxious Species and Vegetation Resources	NA	20	3,198	NA	NA	NA	NA	NA	NA	NA	40,803	NA	44,021
Wetlands, Riparian Zones Soils, and Hydrology	NA	15	3,190	NA	NA	NA	NA	NA	NA	NA	40,455	NA	43,660
Rangeland Resources	NA	15	6,143	NA	NA	NA	NA	NA	NA	NA	112,291	NA	118,449
Recreation	NA	5	261	NA	NA	NA	NA	NA	NA	NA	3	NA	269
General Wildlife, Including Migratory Birds, Pygmy Rabbit, and Bat Species	NA	5	261	NA	NA	NA	NA	NA	NA	NA	3	NA	269
Big Game	NA	40	6,712	NA	23	NA	NA	NA	NA	NA	109,179	NA	115,954
Raptors	NA	20	4,245	NA	23	NA	NA	NA	NA	NA	70,129	NA	74,417
Greater Sage-grouse	NA	156	12,153	NA	262	NA	1,391	47	NA	17	407,142	NA	421,168
Visual Resources	NA	20	1,659	NA	NA	NA	NA	NA	NA	NA	38,491	NA	40,170

NA: Not applicable

1 - Acreages and actions were determined from the BLM's Legacy Rehost 2000 (LR 2000), aerial photography, USFS and BLM geospatial data, USFS SOPA and other pertinent documents. An NA in the table means disturbance specified is not applicable to the CESA.

2 - Oil, gas and geothermal development within each CESA were determined by a review of the "Nevada Oil and Gas Well Map" and "Nevada Geothermal Resources" map available through the Nevada Bureau of Mines and Geology. Most oil and gas wells have been plugged and abandoned, but they have been included as past disturbance.

Disturbance acreage assumes three acres of disturbance for each well site. If LR 2000 data included information on oil and gas pipelines, this was included into the disturbance acreage.

3 - Acreage for agriculture was determined by aerial photographs.

4 - It is not feasible to account for every individual residential home site within each CESA. The urban development disturbance provides the best estimate of disturbance resulting from urban development (primarily residential development), and is based on an aerial analysis of each CESA boundary.

5 - To determine road acreages within each CESA, Interstate 80 was assumed to consist of a 400 foot ROW, United States Highways were assumed to consist of a 100 foot wide ROW; State Routes were assumed to consist of a 50 foot ROW; and all other roads were assumed to consist of a 25 foot ROW. Railroads were assumed to consist of a 200 foot ROW.

Mineral Development and Exploration Actions

Surface disturbance from mineral development and exploration operations by CESA boundary are shown in Table 4.1-2. In general, past and present mining and exploration operations within the overall CESA boundary include: Ruby Hill mine, Bald Mountain operations (including North and South Operations, Alligator Ridge, Yankee, Winrock, and Casino), Robinson Mine, Rain Mine, Emigrant Mine, and Pan Mine (BLM, 2013). Past and present mining activities also include various exploration operations including: Easy Junior, Woodruff Creek, Limo Butte, Lookout Mountain, Maverick Springs, and Wheeler Ridge exploration operations (BLM, 2013; USFS, 2014b). Past un-reclaimed mining activities include the Illipah Mine and the Silverado mill (BLM, 2013). In addition, there are numerous past and present permitted sand and gravel operations throughout the CESA boundaries. There are also numerous authorized Notices of Intent (NOI) for mining exploration operations within the overall CESA boundary. However, disturbance from past NOIs has likely been reclaimed and is not included in this cumulative effects analysis

Utilities, Infrastructure, and Public Purpose Activities

Utilities and infrastructure within the CESAs include various transmission and distribution lines, communication facilities, and telephone and fiber optic lines. Major utilities within the CESAs include the ON Line Project, the Falcon to Gonder 345 kilovolt transmission line, and the Silver State fiber optic line. In addition there are various water and irrigation facilities within the CESAs. Approximate surface disturbance from utilities and infrastructure within the CESA boundaries are shown in Table 4.2-1.

Public purpose sites within the overall CESA boundary include sewage treatment facilities including the City of Elko, the City of Ely, and Eureka County sewage treatment facilities; parks and school sites; various recreation areas and campgrounds; Ely State Prison; and landfills in the City of Ely, Eureka County, and the City of Elko. Surface disturbance from public purpose sites within the CESA boundaries are shown in Table 4.2-1.

Roads and Railroads

There are numerous roads and miles of railroads within the overall CESA boundary. Roads include: Interstate-80; various United States (U.S.) Highways including U.S. Highway 50, U.S. Highway 6, and U.S. Highway 93; various State Routes including State Routes 228, 229, 278, and 379; various local and county roads; and other improved or unimproved roads and trails, including USFS designated roads and motorized trails shown on the Ruby Mountains Ranger District Motor Vehicle Use Maps. Railroads within the overall CESA boundary include the Union Pacific Railroad and the Northern Nevada Railroad. Surface disturbance from roads and railroads within the CESA boundaries are shown in Table 4.2-1

Agriculture

Agriculture within the overall CESA boundary primarily occurs in Eureka County; the Lund area of White Pine County; and at dispersed locations throughout Elko County, including along Ruby Valley Road, in the Lamoille area, and along State Route 230. Surface disturbance from agriculture operations within the CESA boundaries are shown in Table 4.2-1.

Urban Development

Urban development within the overall CESA boundary includes Carlin, the City of Elko, South Fork, Spring Creek, Lamoille, Ruth, the City of Ely, Lund, the Town of Eureka, and the Town of Wells. In addition to the above mentioned towns and cities, there are dispersed residential home sites throughout the overall CESA boundary. However, it is not feasible to account for every individual home site within the CESAs, so Table 4.2-1 accounts for the acres of disturbance associated with the most prevalent urban development within the CESAs.

Oil, Gas and Geothermal Development

Past and present oil, gas, and geothermal development projects were analyzed from NBMG data. Numerous oil and gas wells have been drilled throughout the all of the CESAs. Although many of the oil and gas wells have likely been plugged and abandoned, surface disturbance remains at some of the wells (NBMG, 2001). According to the NBMG “Nevada Geothermal Resources” map, there are two geothermal exploration projects that occur within the overall CESA boundary, exploration operations at Alligator Ridge and exploration in the Butte Valley area (Delcer Buttes) (NBMG, 2010). It was assumed three acres of disturbance for each well site. Surface disturbance from oil, gas, and geothermal developments are shown in Table 4.2-1

Wildland Fires and Vegetation Treatment Projects

Only those wildland fires that occurred in 1999 or later were considered in this cumulative effects analysis. Areas affected by wildland fires that occurred earlier than 1999 have generally recovered and would have no measureable cumulative effects. The total acres of wildland fires for each CESA are presented in Table 4.2-1.

Numerous vegetation treatments and aerial seeding projects have also occurred throughout the CESAs, including the 585 acre Smith Ranch Seeding Project at the Smith Ranch Fire area (USFS, 2013), and past chaining and treatments in the Overland Pass area. Surface disturbance from vegetation treatment projects within the CESA boundaries are shown in Table 4.2-1.

Grazing and Range Improvements

Grazing and grazing allotments occur throughout every CESA boundary. There are fencing and other range improvements within the CESAs as well. However, the grazing allotment acreage, and the acreage associated with range improvements, was not included in the disturbance

calculations in Table 4.2-1 because actual disturbance associated with grazing and range improvements is difficult to quantify.

Fuelwood Harvest

Personal-use fuelwood harvest occurs on NFS and BLM-administered land throughout the CESAs, but surface disturbance is not associated with this activity.

4.3 REASONABLY FORESEEABLE FUTURE ACTIONS

Mineral Development and Exploration Actions

Within the CESA boundaries there are various mining and exploration activities currently proposed with pending approval, including expansion of the Bald Mountain operations in White Pine County, the Gibellini Mine in Eureka County, and the Gold Rock Mine in White Pine County (BLM, 2013; USFS, 2014b). There are also numerous NOIs for exploration operations within the overall CESA boundary. Estimated surface disturbance from reasonably foreseeable future mineral development and exploration projects within the CESA boundaries are shown in Table 4.2-1. There are also several pending sand and gravel operations within the CESA boundaries.

Utilities, Infrastructure and Public Purpose Activities

There are several pending applications for various power line infrastructure (primarily electrical distribution lines) and water infrastructure, including a water pipeline to serve the reasonably foreseeable future Gibellini Mine. Reasonably foreseeable future public purpose activities include the expansion of the City of Elko landfill and sewage treatment facility (BLM, 2013). Surface disturbance from reasonably foreseeable future utilities, infrastructure and public purpose activities within the CESA boundaries are shown in Table 4.2-1.

Roads

There are several pending ROWs for road construction. Pending road construction consists primarily of new access roads to residences and communication sites, or for grazing operations. Surface disturbance from reasonably foreseeable future roads within the CESA boundaries are shown in Table 4.2-1.

Vegetation Treatment Projects

Reasonably foreseeable future vegetation treatment projects include: the Currant-Ellison Watershed Restoration Project; the Combs Creek Habitat Improvement and Fuels Reduction Project; the Egan Range Aspen Restoration Project; the Egan/Johnson Basin Habitat Improvement Project; the Ward Mountain Restoration Project; and, the Huntington-Newark Watershed Project. These projects are proposed for habitat improvements and restoration, water quality improvements, and fuels reduction throughout the CESAs. Surface disturbance from

reasonably foreseeable future vegetation treatment projects within the CESA boundaries are shown in Table 4.2-1.

Fuelwood Harvest

Fuelwood harvesting is expected to continue within the CESAs, with no anticipated surface disturbance associated with this activity.

Grazing and Range Improvements

Grazing and range improvements are expected to continue within the CESAs.

4.4 CUMULATIVE EFFECTS

4.4.1 Non-Native, Invasive and Noxious Species and Vegetation Resources

Within the CESA (Figure 4.4-1), the impervious surfaces and landscaping associated with urban development have permanently removed native vegetation cover. Native vegetation cover has also been permanently removed by the roads and trails in the CESA, public purpose sites, and mining activities. Other past and present actions have changed the species composition and structure of vegetation cover, mostly from removal of vegetation associated with surface disturbance. However, grazing has affected species composition because livestock select or avoid specific plant species, and vegetation species have differing levels of tolerance to grazing (Szaro, 1989). The management of vegetation cover within the ROWs for utility lines has also altered species composition. The objective of past, present and reasonably foreseeable future vegetation treatment projects within the CESA have generally been to directly or indirectly improve the health of vegetation communities. Wildland fire within the vegetation CESA has caused substantial changes to the composition and condition of the vegetation communities. Reasonably foreseeable future sand and gravel operations and mining and exploration operations would impact additional vegetation cover in the CESA (Table 4.2-1).

At the time of their construction or implementation, all of the past and present actions considered in this analysis may have introduced or contributed to the spread of non-native, invasive and noxious species within the CESA. Present actions that may continue to introduce or contribute to the spread of non-native, invasive and noxious species within the CESA include the maintenance of existing utility lines and water pipelines, maintenance and use of roads and trails, and livestock grazing. Many non-native, invasive and noxious species are prone to colonization of areas burned in wildland fire, and it is possible that these species occur in the CESA partially due to wildland fire. The RFFAs on BLM-administered or NFS land in the CESA would be subject to control and treatment of non-native, invasive and noxious species, thus reducing their impact on native vegetation cover.

Proposed Action

The Proposed Action would impact approximately 13,000 to 14,850 acres of vegetation cover within the CESA. Impacts would include modification of species composition and structure, direct mortality from treatment activities, indirect mortality from crushing, uprooting, and trampling of vegetation during implementation, and potential establishment or spread of non-native, invasive and noxious species. Modification of vegetation cover and intentional removal of certain vegetation types would be to improve the long-term ecological health and resiliency of the vegetation communities within the Project Area. Indirect mortality would be minimized with Project design features. Project design features would require the treatment and control of noxious weeds. The incremental impact of the short-term effects of the Proposed Action would be minor when combined with past, present and RFFAs.

No Action Alternative

Under the No Action Alternative, direct removal of vegetation or modification of vegetation within the Project Area would not occur. However, existing infestations of non-native, invasive species within the Project Area would not be treated. Existing noxious weed species on BLM-administered land would continue to be treated as described in the Ely District Integrated Weed Management Plan. Continued use of roads and continued recreation in the area may cause weeds to spread within the Project Area, as well as throughout other portions of the CESA. None of the reasonably foreseeable future vegetation treatment projects would treat specific infestations within the Project Area, but RFFAs on BLM- or NFS-administered land would require treatment of infestations elsewhere in the CESA. The incremental impact from the potential spread of non-native, invasive and noxious species throughout the Project Area would have negligible cumulative impacts on vegetation resources within the CESA.

4.4.2 Wetlands, Riparian Zones, Soils, and Hydrology

Past and present actions within the CESA (Figure 4.4-2; Table 4.2-1) have disturbed soils and most have caused soil compaction. Past and present actions have also removed vegetation cover, which combined with disturbed soils, has caused erosion and sedimentation of surface waters. Some past and present actions have also crossed streams and drainages, which may have resulted in additional erosion and sedimentation and other water quality impacts, as well as potentially impacting riparian zones. Past and present geothermal exploration activities and mineral exploration activities may have also had impacts on groundwater, although there is no known available data suggesting such impacts.

Proposed Action

The USFS Equivalent Roaded Acreage (ERA) Model was used to analyze and quantify the cumulative watershed effects (CWE). Impact potential is indexed by relating the impacts of all existing and planned actions in a watershed to the impact that would be expected from roads.

The sum of the indices represents the percentage of the watershed in road surface that would produce the same effects as the past and present actions and RFFAs (USGS, 1997). Analysis of the Proposed Action, incorporating all treatments and baseline conditions (i.e., past, present and RFFAs), resulted in a percent ERA increase of 1.29 percent, for a total percent ERA of approximately 28.6 percent of the threshold of concern during the first year of treatment. The total percent ERA would increase slightly during 2015 due to future vegetation treatments scheduled to occur, and then decrease every year afterward during recovery. The CWE ERA analysis indicates that the CESA would remain at Low Risk of adverse CWE through the temporal extent of the cumulative effects analysis. The ERA modeling input, data and results can be found in the *Specialist Report, Hydrology and Soils, Overland Pass Habitat Improvement Project* (JBR, 2014a).

The Proposed Action may result in increased sedimentation and soil erosion resulting from the removal of vegetation cover and soil disturbance, increased soil compaction resulting from increased vehicle and mechanical traffic, and potential increased evaporative loss from the site due to the change in microclimate above and around the Project Area. Cumulative impacts from implementing the Proposed Action are expected to improve the overall stability of soils and their resistance to erosion. Improving soil cover and stability by improving vegetative conditions through the implementation of treatments such as seeding, would improve the overall watershed condition, as well as soil stability, which would indirectly reduce potential for adverse cumulative impacts to soil resources.

As a result of project design features and BMPs, the long-term beneficial effects of the Proposed Action, the CWE ERA analysis, and the fact that RFFAs on BLM-administered and NFS land would be required to comply with all applicable laws and policies, cumulative impacts of the Proposed Action when combined with past and present actions and RFFAs would be minor and would decrease to negligible within several years following implementation.

According to the NHD (USGS, 2014) and the NWI dataset (USFWS, 2014a), no wetlands or riparian zones occur within the Project Area. However, there is potential for undocumented wetlands or riparian zones to occur in association with any of the spring sites that have been documented within the Project Area (Section 3.8.1). Impacts from the Proposed Action on riparian zones would primarily occur during the Cracker Johnson Spring No. 2 restoration, which would result in short-term, minor impacts (Section 3.9.2). The spring restoration ultimately would result in a long-term improvement to the riparian zone associated with Cracker Johnson Spring No. 2. As a result, and because the overall impact of the Proposed Action on riparian zones within the Project Area would be negligible, the Proposed Action would result in negligible cumulative impacts to wetlands and riparian zones within the CESA.

No Action Alternative

Under the No Action Alternative, there would be no immediate direct or indirect effects to existing hydrologic and soil uses or opportunities; thus, there would be no impact on these resources. Analysis of the CWE ERA for the No Action Alternative indicates that all impacts due to past, present, and reasonably foreseeable actions amount to approximately 20 percent of the threshold of concern. As such, the No Action Alternative would result in a Low Risk of adverse CWE, and would not have any cumulatively considerable impacts on hydrologic and soil resources. Indirect effects to wetlands and riparian zones would likely include continued establishment of upland and forest vegetation species into riparian areas. This establishment would be likely to result in long-term, minor effects on riparian vegetation.

4.4.3 Rangeland Resources

The impervious surfaces and landscaping associated with urban development have permanently removed vegetation cover in the CESA (Figure 4.4-3) that would otherwise be available for livestock grazing. However, since all of the urban development within the CESA has likely been existing for many years, and was likely developed on private property which would have restricted grazing access, cumulative impacts to rangeland resources from urban development is negligible. Vegetation cover suitable for grazing has also been permanently removed by the roads and trails within the CESA. Surface disturbance from other past and present actions has also removed vegetation cover, which has had long-term impacts on grazing forage. The surface disturbance from past and present actions may have contributed to the spread of non-native, invasive and noxious species in the CESA. Travel on roads and trails and wildland fires have also likely contribute to non-native, invasive and noxious species populations in the CESA which impact grazing by displacing native vegetation and grasses that are better suited for grazing.

Oil, gas, and geothermal development, sand and gravel operations, mineral exploration, and mining operations, and public purpose sites have directly removed land that would otherwise be available for livestock grazing.

Reasonably foreseeable sand and gravel operations and mining operations would remove additional area for grazing in the CESA. The LRMP requires postponement of livestock grazing for a minimum of two-years following vegetation treatments. Accordingly, reasonably foreseeable future vegetation treatment projects would temporarily reduce the area available for grazing within the CESA. The continued use of roads and trails in the CESA may contribute to additional establishment or spreading of non-native, invasive and noxious species that displace grazing forage. However, RFFAs on BLM-administered or NFS land would be subject to controlling and treating noxious weeds and possibly non-native, invasive species.

Proposed Action

The Proposed Action would result in direct impacts to livestock grazing area spread over 10 years. However, surface disturbance would be dispersed throughout the Project Area and grazing would generally be able to continue in many portions of the Project Area during implementation of treatments. Allotments may be rested or rotations of livestock may be modified for the two-year postponement required following treatments. However, the Proposed Action may increase forage in the area in the long term. Cumulative impacts would be minor since the treatments would occur over a 10-year period and would not eliminate grazing operations for the entire Project Area all at one time.

No Action Alternative

The No Action Alternative would not be anticipated to have any direct or indirect effects on rangeland resources. Because the proposed treatments would not be implemented, the No Action Alternative would not result in any new surface disturbance that may reduce the area available for grazing, or result in the need for resting allotments within the CESA. However, potential cumulative impacts to livestock grazing may include future reductions in permitted use as tree establishment continues and competition among wildlife and livestock increase due to limited forage availability.

4.4.4 Recreation Resources

Within the CESA (Figure 4.4-4), surface disturbance from past and present sand and gravel operations, mining and exploration operations, and existing roads and trails have impacted recreation settings and experiences by removing vegetation cover and modifying landforms in the otherwise natural-appearing landscape. Disturbance from past and present vegetation treatment projects and wildland fires has modified vegetation cover, but such modifications appear more natural than the loss of vegetation cover that has occurred from sand and gravel operations, mining, and roads and trails. Because the impacts to vegetation cover appear more natural, disturbance from vegetation treatment projects and wildland fires have generally had less impact on recreation experiences.

The amount of public land open to recreational use within the CESA has been reduced by present sand and gravel operations and mining and exploration operations. These areas are fenced and public access is prohibited for the operational life of the sand and gravel operation or mining and exploration operation. The loss of accessibility to these areas may have caused some recreationists to be displaced to surrounding areas, thereby increasing recreational use elsewhere in the CESA. If such an increase has occurred from displaced users, recreation settings and experiences related to solitude and isolation would be impacted from the potential for increased encounters with other users. Personnel of present sand and gravel operation and mining and

exploration operations travelling to and from these projects daily would also increase the potential for recreation users to encounter other people.

Existing roads and trails have increased accessibility within the CESA, including accessibility for motorized recreation. In areas near roads and trails open to motorized travel, recreationists are more likely to hear mechanical and motorized sounds and are more likely to encounter other users. The increased potential for these types of encounters have impacted recreation opportunities provided by settings with little to no human presence or modifications, and experiences of solitude, isolation, and tranquility.

The RFFAs in the recreation CESA include additional sand and gravel operations, mining and exploration operations, and vegetation treatment projects. Reasonably foreseeable future sand and gravel operations and mining and exploration operations would result in additional loss of public land available for recreation and additional long-term loss of vegetation cover and modification of landforms. The current area within the CESA providing recreation settings with little to no modification or evidence of humans would be reduced from these actions if located within or adjacent to these more pristine areas. These actions would also require additional personnel to operate, which would increase the potential for recreationists to encounter other users. Reasonably foreseeable future vegetation treatment projects would also increase the number of people within the CESA and would modify vegetation cover. However, the increased number of people and closure of the treatment areas would be temporary, occurring only during implementation of the treatment activities. Modifications to vegetation cover would generally appear natural following the completion of the treatment, and would have little impact on recreation setting and experiences.

Proposed Action

Surface disturbance from the Proposed Action would contribute to the cumulative recreation impacts that have resulted from surface disturbance associated with past and present actions, and RFFAs. Surface disturbance impacts would include modifying the recreation settings and experiences by altering vegetation cover and increasing the evidence of humans in the CESA. Surface disturbance from the Proposed Action is anticipated to recover relatively quickly after treatments are completed. Thus, the incremental impact of surface disturbance from the Proposed Action would be greatest during the 10 years of implementation, but would quickly diminish to negligible afterwards. In addition, the treatments would occur in phases which would reduce the overall long-term cumulative impacts from the Proposed Action.

Table 4.4-1 presents the approximate acres of each ROS class and BLM Extensive Recreation Management Area within the CESA that have been impacted from past and present actions and RFFAs, combined with the Proposed Action. The table only considers the direct impacts from

surface disturbance associated with past and present actions, RFFAs, and the Proposed Action. It does not include indirect impacts such as increased use in some areas due to displacement from areas closed or impacted by other actions.

Table 4.4-1 Cumulative Surface Disturbance by Recreation Management Designation

Recreation Management Designation	Acres of Surface Disturbance			Area Not Impacted (acres)
	Present Actions & RFFAs	Proposed Action	Total (All Actions)*	
Primitive ROS	0	239	239	459
Semi-Primitive Non-Motorized ROS	19	1,298	1,317	6,947
Semi-Primitive Motorized ROS	2,044	8,180	10,224	6,081
Extensive Recreation Management Area	3,374	8,520	11,894	6,484

*Sum of past and present actions, RFFAs and the Proposed Action.

There are no past and present actions or RFFAs within the Primitive ROS class. Approximately 34 percent of the NFS land designated as Primitive ROS class in the CESA would be impacted by the Proposed Action. Additionally, the noise and sights of equipment and personnel used to perform treatments would increase, but would be present only near the treatment area and for the duration required to complete the treatment. Approximately 459 acres (66 percent) of the NFS land designated as Primitive ROS class within the CESA would remain undisturbed from the Proposed Action and RFFAs, which would allow for uninterrupted recreation use over a large portion of this class during implementation of the Proposed Action. Since there are no other RFFAs within the Primitive ROS class which would result in a cumulative impact when combined with the Proposed Action; and because the Proposed Action impacts would be short-term, cumulative effects would be negligible to recreation resources within the Primitive ROS class within the CESA.

Approximately 16 percent of the NFS land designated as Semi-Primitive Non-Motorized ROS class would be impacted after implementation of the Proposed Action. However, approximately 6,947 acres (84 percent) of the Semi-Primitive Non-Motorized ROS class would not be impacted from the Proposed Action and the other past and present actions and RFFAs. This would allow uninterrupted recreation use on a large portion of the NFS land designated Semi-Primitive Non-Motorized ROS within the CESA. Because approximately 84 percent of the Semi-Primitive Non-Motorized ROS class would remain undisturbed, and the Proposed Action impacts would be short-term, the cumulative effects on recreation resources within the Semi-Primitive Non-Motorized ROS class would be negligible.

Approximately 63 percent of the NFS land designated as Semi-Primitive Motorized ROS class would be impacted by the Proposed Action and the past and present actions and RFFAs. Approximately 6,081 acres (37 percent) of the Semi-Primitive Motorized ROS class would not be impacted from the combined cumulative surface disturbance of the Proposed Action, past and present actions, and RFFAs. This would allow for uninterrupted recreation use within these areas of the ROS class. Because this ROS class is less dependent on isolation, solitude and tranquility for recreational enjoyment, and the fact that users in this class often encounter motorized traffic, other recreation users, and evidence of humans and human induced controls and restrictions, cumulative effects would be minor during implementation of the Proposed Action. In addition, approximately 96 percent of the disturbance in this ROS class is associated with vegetation treatments projects and wildland fires, and any continued impact on recreation resources from these two disturbance types is most likely negligible. Cumulative effects from the Proposed Action on the Semi-Primitive Motorized ROS class would be negligible after project treatments are completed and temporary closures and all required fencing is removed.

Approximately 6,484 acres (35 percent) of BLM-administered public land would not be impacted from the cumulative disturbance of the Proposed Action, past and present actions, and RFFAs. Approximately 65 percent of the BLM-administered public land within the CESA would be affected from the combined surface disturbance of the Proposed Action, past and present actions, and RFFAs. Most of the cumulative surface disturbance would result from the Proposed Action; however, the treatments from the Proposed Action would occur over a 10-year period, which would reduce impacts to recreation resources within the BLM-administered public land. In addition, a large percentage of the disturbance to the BLM-administered public land within the CESA is associated with vegetation treatments projects and wildland fires, and any continued impact on recreation resources from these two disturbance types is most likely negligible. Because recreation activities on the BLM-administered public land are less dependent on experiences of isolation, solitude and tranquility, and the fact that users in this class often encounter motorized traffic, other recreation users, and evidence of humans and human induced controls and restrictions, the cumulative effects during implementation of the Proposed Action would be minor. In addition, BLM-administered public land managed as Extensive Recreation Management Area and offering similar recreation opportunities is abundant in areas surrounding the CESA. After project treatments are completed and all fencing required is completely removed, cumulative effects to recreation resources from the Proposed Action on BLM-administered public land would be negligible.

No Action Alternative

The No Action Alternative would not be anticipated to have any direct or indirect effects on recreation resources. Because the proposed treatments would not be implemented, the No

Action Alternative would not result in any new surface disturbance within the CESA that may otherwise impact recreation settings and experiences.

4.4.5 Wildlife

For the cumulative effects analysis, wildlife was grouped into four categories: 1) raptors; 2) general wildlife including migratory birds, pygmy rabbit, and bat species; 3) big game; and 4) greater sage-grouse. The CESA description and explanation for each wildlife group is detailed in Table 4.2-1. The CESA boundary for each group is presented on Figure 4.4-5.

Raptors

The surface disturbance associated with the past and present actions in the CESA, as presented in Table 4.2-1, represents an equivalent area of either foraging or nesting habitat, or both, that has either been lost or modified. The surface disturbance associated with RFFAs in the CESA would modify or remove additional raptor habitat. Suitable habitat in the raptor CESA has also been fragmented from linear past and present actions, such as roads and trails, utility lines, pipelines, and railroads. Reasonably foreseeable future power lines and water pipelines would further fragment habitat in the CESA. While the effects to habitat from most of the past and present actions have generally directly impacted habitat quality or availability, most of the past and present vegetation treatment activities have directly or indirectly improved habitat quality. Surface disturbance associated with reasonably foreseeable future vegetation treatment projects would be expected to either directly or indirectly improve habitat quality.

The ongoing operation of some present actions, such as roads, urban development, and mining operations generate noise and visual disruptions and human activity that may cause raptors to avoid using habitat in the surrounding area. Present public purpose sites, particularly recreation sites also produce similar disruptions and are often associated with regular human activity, which may lead to avoidance of otherwise suitable habitat. Reasonably foreseeable future mining operations would create additional long-term noise and visual disruptions and human presence, potentially leading to additional avoidance of otherwise suitable habitat. Nest sites within proximity to reasonably foreseeable future mining operations may be abandoned if noise and visual disruptions and human activity are constant and of substantial intensity. Abandonment of nests would likely lead to mortality of the young birds. Mortality of adult birds from collisions with vehicles operated on existing roads may have also occurred, and would remain a possibility in the reasonably foreseeable future as travel on roads would continue.

Proposed Action

The Proposed Action would result in additional loss or modification of foraging and nesting habitat and additional human activity and auditory or visual disruptions in the CESA. Most of these impacts would be temporary and would only occur during treatment activities. The increase

in desirable understory species and the transition to more diverse ecosystems resulting from the Proposed Action would improve wildlife habitat quality in the long-term, but would also reduce tree cover and nesting area for some raptors. Adverse impacts to raptors nests would be avoided. The majority of surface disturbance from RFFAs in the CESA would be associated with vegetation treatment projects, and would generally improve habitat quality. Additionally, all RFFAs on BLM- and NFS-administered land would have to comply with all applicable laws and policies, and would incorporate project design features and environmental protection measures (EPM) to minimize impacts to raptors, and include mitigation measures to reduce unavoidable impacts. Consequently, the Proposed Action would have minor cumulative impacts on raptors when combined with the impacts from past and present actions and RFFAs in the CESA.

No Action Alternative

The No Action Alternative would not have any cumulative impacts on raptors.

General Wildlife, Including Migratory Birds, Pygmy Rabbit, and Bat Species

All of the past and present actions within the CESA have resulted in the loss or modification of habitat suitable for general wildlife and migratory birds. Noise and visual irritation from present mining and exploration operations and public purpose sites has affected wildlife by causing avoidance of the habitat near these actions. Noise and visual irritation from travel on roads and trails has also caused avoidance of nearby habitat. Roads and utilities have fragmented habitat in the CESA, as have wildland fires. Wildland fires and roads have also likely caused direct mortality of general wildlife and migratory birds, and potentially pygmy rabbit.

Livestock grazing may reduce ground cover and nutrient content of forbs and grasses which may have impacts to pygmy rabbit (Thines et al., 2004). Livestock grazing may also have damaged or destroyed rabbit burrows. Migratory birds have been impacted from grazing because nesting success is reduced from the loss of grass understory that is caused from grazing. The reduced grass understory may impact many species of general wildlife by creating increased competition for forage area.

Removal of sagebrush habitat associated with RFFAs may increase predation of pygmy rabbits and other wildlife, and would result in avoidance of otherwise suitable habitat. Removal of pinyon and juniper trees from RFFAs would further reduce habitat for pinyon-juniper dependent species, including the pinyon jay. However, the removal of pinyon and juniper trees would reduce the number of raptor perches in the CESA, which would likely decrease predation of pygmy rabbits and other small mammals, migratory bird nests, and reptiles.

Continued present actions and RFFAs have the potential of a “take” of golden eagle or migratory birds or their nests. The RFFAs proposed on BLM-administered or NFS land would be required

to comply with the MBTA and/or the BGEPA, so a “take” of nests or eagles from these actions would be unlikely. Very few of the RFFAs in the CESA are proposed on private land. Thus, a downward trend in nesting success or eagle populations in the CESA is unlikely in the reasonably foreseeable future.

Proposed Action

The Proposed Action would result in loss and modification of habitat, auditory or visual irritation, and possibly mechanical related mortality. Impacts from noise and visual irritation and mechanical related mortality would be temporary and would only occur during treatment activities. In addition, the proposed treatments would occur at times of the year when mechanical related mortality would be at its lowest probability (i.e., outside of the migratory bird breeding and nesting season), which would reduce disturbance to nesting birds or foraging habitat. The increase in desirable understory and transition to more diverse ecosystems resulting from the Proposed Action would improve wildlife habitat quality in the long-term, but would result in short-term habitat disruption. Additionally, removal of pinyon and juniper may impact species dependent on these habitats, including the pinyon jay. Cumulative impacts of the Proposed Action when combined with the impacts from past and present actions and RFFAs would not exceed minor or result in a loss of viability or trend toward federal listing for any wildlife species.

No Action Alternative

Indirect effects of the No Action would include continued loss of sagebrush habitat from establishment of pinyon and juniper trees. Cumulative impacts would be negligible because reasonably foreseeable future vegetation treatment projects would increase sagebrush habitat in the CESA, and the pinyon and juniper remaining within the Project Area would continue to provide habitat for pinyon jay and other species depending on pinyon-juniper habitat.

Big Game

All of the past and present actions in the CESA have resulted in the loss or modification of big game habitat. Past and present actions such as urban development, public purpose sites, roads and trails, oil, gas and geothermal development, and mineral exploration and mining operations (including sand and gravel operations) have resulted in the long-term to permanent loss of big game habitat. Past and present agriculture and management of vegetation within the ROWs for utility lines and water pipelines have modified habitat. Modification of habitat has decreased the habitat quality, and in some areas resulted in the loss of habitat. Wildland fire has also modified and destroyed habitat within the CESA.

Past and present vegetation treatment projects have generally improved the health of vegetation and habitat quality in the CESA. However, the removal of pinyon and juniper from these treatment projects has reduced the area of mule deer cover within the CESA.

Reasonably foreseeable future mining and exploration operations, sand and gravel operations and utility line ROWs would impact additional potential big game habitat within the CESA. Reasonably foreseeable future vegetation treatments would impact additional potential big game habitat, but habitat quality would generally improve following the vegetation treatment projects. However, cover for mule deer may be reduced after completion of vegetation treatment project.

Seasonal migration corridors for mule deer occur in the eastern and central portion of the big game CESA. Past and present mining and mineral exploration projects have removed habitat from some locations within the corridors. There are numerous roads and trails that also cross the corridor. While mule deer continue to migrate within these corridors, it is possible that mining and exploration operations and roads and trails have affected mule deer movement. It is also possible that wildland fires within the corridor have altered habitat and affected migratory movements. However, there is no known data available comparing migration numbers prior to the roads and trails, mining operations, and wildland fires that occur within the migration corridors.

Reasonably foreseeable future mining and exploration projects would partially be located within the same mule deer migration corridors that past and present mining and exploration projects are located. The projects would remove habitat from within the corridor, which may potentially affect seasonal mule deer migration. Additionally, reasonably foreseeable future vegetation treatment projects are also proposed partially within the corridors. Potential impacts to mule deer migration movement from vegetation treatment projects would be expected to be temporary, occurring only during implementation of the treatment activities. In the long-term, habitat quality would be improved within portions of the corridor where reasonably foreseeable future vegetation treatment projects are proposed.

Mule deer and other big game species have likely suffered mortality from vehicle collisions on the existing roads within the CESA. Continued travel on roads would be expected to result in additional mortality in the reasonably foreseeable future. Roads and trails, as well as utility lines and water lines have also fragmented habitat within the CESA. Recreational uses within the CESA have also caused avoidance of habitat near roads and trails and other public purpose sites with recreational uses. Recreational use of the CESA is expected to occur into the reasonably foreseeable future.

Proposed Action

During implementation of the Proposed Action, mule deer may avoid the Project Area due to the increased noise and visual irritations associated with project equipment and personnel. Short-term impacts to habitat following the proposed treatments may also affect big game use and habits within the Project Area, including within a migration corridor for mule deer. However, the Proposed Action would improve habitat quality in the long term. Long-term impacts would also result in a loss of mule deer cover from removal of pinyon and juniper trees, although this habitat type is abundant in the surrounding area. Most of the RFFAs in the big game CESA consist of vegetation treatment projects that would also have long-term improvements to wildlife habitat, but would also likely reduce the mule deer cover available within the CESA. However, other pinyon and juniper cover occurs within the CESA and would not be removed from the Proposed Action or any of the RFFAs proposed in the big game CESA. The cumulative impact would be negligible to minor because habitat quality would improve in the long-term, and because the viability of any big game species would not be reduced or jeopardized.

No Action Alternative

Indirect effects of the No Action Alternative would include continued loss of mule deer summer and winter habitat from establishment of pinyon and juniper trees in sagebrush habitat. Cumulative impacts would be negligible because reasonably foreseeable future vegetation treatment projects would increase sagebrush habitat in the CESA, and the pinyon and juniper remaining within the Project Area would serve as cover habitat for mule deer. The No Action Alternative would not be expected to have cumulative impacts on any other big game species.

Greater Sage-Grouse

Table 4.2-1 details past, present and RFFAs within the CESA. However, not all of the disturbance detailed on Table 4.2-1 is within designated greater sage-grouse habitat. The surface disturbance from past and present actions within the greater sage-grouse CESA have altered or removed approximately 279,571 acres of habitat that the BLM has designated as either essential/irreplaceable habitat, important habitat, or habitat of moderate importance. Approximately 35,272 acres of habitat was impacted from past vegetation treatment projects (BLM, 2012a). Past vegetation treatment projects generally improve greater sage-grouse habitat by increasing the amount and quality of sagebrush habitat within the CESA.

In addition to direct loss or modification of habitat, past and present urban development, public purpose sites, and roads, as well as present mining operations and recreational uses, have increased human activity and presence in the CESA. Increased human activity has caused visual and noise irritations that have likely led to avoidance of habitat near these activities. Existing roads, as well as railroads and utility lines have also caused fragmentation of greater sage-grouse habitat.

The RFFAs would impact an additional approximately 166,837 acres of greater sage-grouse habitat that the BLM has designated as either essential/irreplaceable habitat, important habitat, or habitat of moderate importance. However, the majority of the impacts (approximately 163,896 acres) would occur from reasonably foreseeable future vegetation treatment projects. Reasonably foreseeable future vegetation treatment projects may impact greater sage-grouse during operations from increased visual and noise irritation. However, these impacts would be temporary and limited to implementation of the treatment activities. Long-term impacts would generally improve greater sage-grouse habitat because the vegetation treatment projects would increase the amount of quality habitat available to greater sage-grouse in the CESA. The remaining approximately 2,941 acres of habitat that would be impacted from RFFAs would be largely from mining and exploration operations. Mining and exploration operations would have long-term permanent impacts on habitat.

Proposed Action

The Proposed Action may result in greater sage-grouse avoidance of the Project Area during implementation and direct mortality from vehicles, mechanical treatments, and prescribed burning. Short-term impacts may also result from habitat modification, but the Proposed Action would ultimately improve greater sage-grouse habitat in the long-term. The Proposed Action would not result in a trend toward federal listing or a loss of viability of greater sage-grouse when combined with the impact of the other actions in the CESA. Accordingly, the cumulative impact to greater sage-grouse from the Proposed Action would be minor.

No Action Alternative

Under the No Action Alternative, there would be no direct or indirect Project-related cumulative impacts to greater sage-grouse or habitat within the CESA. Pinyon and juniper trees would continue to establish in sagebrush habitat within the Project Area. This continued establishment would contribute to additional loss of sagebrush habitat within the CESA. Impacts may result from the additional loss of habitat. However, reasonably foreseeable future vegetation treatment projects would be anticipated to improve the amount and quality of greater sage-grouse habitat elsewhere in the CESA, thus reducing impacts to greater sage-grouse.

4.4.6 Visual Resources

Past and present actions have increased the number of artificial landscape features in the visual resources CESA (Figure 4.4-6). Existing utility lines have added power poles, overhead wires, and other related infrastructure to the CESA, which has increased form, line, color, and texture elements that contrast with the elements associated with natural landscape features. Roads and trails have added form and line elements that are generally straight and very geometric, which often contrasts with the irregular forms typical of the natural landscape features within the

CESA, such as rugged mountains and mixed shrub vegetation. Mining and exploration operations have reshaped landforms into somewhat geometric form elements, which tend to contrast with the natural landscape features. Urban development has increased contrasting form, line, color and texture elements, but the impact has been negligible due to the minimal urban development that has occurred in the CESA. Range improvements and public purpose sites have also contributed similar contrasting elements with negligible consequences to visual resources. The removal of vegetation cover associated with the surface disturbance from the aforementioned past and present actions has created additional visual contrast with the otherwise undisturbed vegetation cover in the surrounding proximity.

Wildland fire and vegetation treatment projects have had less impact on visual resources than the other past and present actions that have occurred in the CESA. Changes to the landscape from wildland fire and vegetation treatment projects appear more natural and have less visual contrast than features and changes associated with the other actions, such as power poles. Additionally, visual contrast associated with wildland fire and treatment projects has decreased with each growing season since they occurred, as vegetation cover has recovered or established.

Visual contrast within the CESA would increase with implementation of the RFFAs. Reasonably foreseeable future mining and exploration operations would require surface disturbance for access roads, haul roads, waste rock piles, and other features typical of mineral extraction activities. This surface disturbance would increase form, line, color, and texture elements which contrast with the elements of the natural landscape in the CESA. Additionally, mining equipment such as loaders and haul trucks would introduce line, color, and texture elements that are atypical of the natural landscape. Mining and exploration operations on BLM- or NFS-administered land would be required to reduce visual contrast as much as practicable and would be required to comply with the applicable visual resource management objectives. Reasonably foreseeable future vegetation treatment projects would also be subject to these requirements and compliance. Additionally, future vegetation treatment projects would be expected to have minimal visual contrast after implementation is completed because changes to the landscape would generally appear natural.

Proposed Action

The incremental impacts on visual resources from the Proposed Action would have a negligible cumulative impact. The cumulative impact would be negligible because the visual contrast created by the project would be negligible and short-term and generally not coincide with contrasting elements from reasonably foreseeable future mining and exploration operations. Additionally, the incremental increase in visual contrast from the Proposed Action when combined with the visual contrast from the other actions in the CESA would not result in noncompliance with any USFS SIOs or BLM VRM objectives.

No Action Alternative

Under the No Action Alternative, stands of pinyon and juniper would continue to increase in density and extent within the Project Area. However, implementation of reasonably foreseeable future vegetation treatment projects elsewhere in the CESA would reduce the density and extent of pinyon and juniper. Shrub and grass cover would become more abundant in these areas. The denser and more expansive stands of pinyon and juniper within the Project Area would contrast with the surrounding vegetation characterized by fewer trees and more shrubs and grasses. However, trees would still be relatively common throughout the CESA after RFFAs have been implemented, which would reduce the degree of contrast that trees within the Project Area have relative to the CESA. Cumulative impacts of the No Action Alternative would be negligible.

5.0 TRIBES, INDIVIDUALS, ORGANIZATIONS, AND AGENCIES CONSULTED

5.1 TRIBES

Battle Mountain Band Council - Michael Young, Chair
Confederated Tribes of the Goshute Reservation - Amos Murphy, Chair
Duckwater Shoshone Tribe - Virginia Sanchez, Chair
Elko Band Council - Gerald Temoak, Chair
Ely Shoshone Tribe - Alvin S. Marques, Chair
Moapa Band of Paiutes - William Anderson, Chair
Paiute Indian Tribe of Utah - Jeannie Borchardt, Chair
Skull Valley Band of Goshute Indians - Lori Bear Skiby, Chair
South Fork Band Council - Sim Malotte, Chair
Te-Moak Tribe of the Western Shoshone Indians of Nevada - Bryon Cassadore, Chair
Wells Band Council - Paula Salazar, Chair
Yomba Shoshone Tribe - David Smith, Chair

5.2 INDIVIDUALS

The following individuals were included in the mailing list during the scoping process.

Betty Baker	Vicki Huston
Nancy Baker	Larry Hyslop
Harvey Barnes	Dana Johnson
Lacy Bourdet	Don King
Doug Busselman	Edward Koch
John Carpenter	Bill Kohlmoos
Doug Carriger	Mike Lattin
Keith & Paula Carson	Frederick Leeds
Jacob Carter	Curt Leet
Steven Carter	Nevada Loper
Robert Dickenson	Leonard Markley
Richard Dielman	Jerry McGuire
John Ellison	Jay Nelson
Darrell Freeman	Pete & Rama Paris
J.J. Goicoechea	Mark Peplowski
Pete & Julian Goicoechea	Harry Peters
Kathy Gregg	Jack Prier
Tedd Heggie	Susan Purcell
Vaughn Higbee	Dean Rhodes
Craig Hoover	Mike Riordon
Bruce Hubbard	Doug Robison

Paula Roth
Joan Schulenberg
Debbie Shade
Marge/Marjorie Sill
Connie Simkins
James Tallerico
Gracian Uhalde

Thelora Warr
Richard Wright
Simone Zaga
John Zillich
Kathy Zillich
Tony Zunino

5.3 ORGANIZATIONS

The following organizations were included in the mailing list during the scoping process:

8 Mile Farms
America's Wildhorse Advocates - Garnet Pasquale
Barrick Goldstrike - Lands Department
Barrick Goldstrike - Gary Sundseth
Bridgeport Gold, Inc.
Bridgeport Ventures Inc.
Burrows Irrevocable Trusts
Center for Biological Diversity - Rob Mrowka
City of Caliente
City of Ely
City of Pioche
City of Wells
Columbus Gold US Corporation
Diamond X Bar Ranch - Ray Merkle
Duval Ranching Company
Eastern Nevada Landscape Coalition - Betsy McFarlan
Elko City Council - Jim Conner, Jay Elquist, Chris Johnson, Rich Perry, John Patrick Rice
Elko County Commission - Chairman
Elko County Conservation Association - Merlin McColm
Elko County Manager - Rob Stokes
Elko County Natural Resource Management Advisory Commission - Randy Brown,
Eleanor O'Donnell
Elko Free Daily Press - Editor
Ely City Council - Jennifer Lee
Ely Times
Friends of Nevada Wilderness - Shaaron Netheron
Gold Standard Royalty, Inc.
Great Basin Bird Observatory
Great Basin Resource Watch

Halstead Forsgren Inc., DBA Duckwater Cattle Company
Harold Rother Farms, Inc - Ira Renner, Shirley Rother
Intertech Services Corporation - Mike Baughman
Lincoln County Commission
Lincoln County Planning and Building - Cory Lytle
Moriah Ranches, Inc - David & Ruth Eldrige
Mule Deer Foundation, Bristlecone Chapter - Russel Lyons
Mule Deer Foundation, Elko Chapter - Barb Maple
Mule Deer Foundation - Farley Hicks
Nevada Cattlemen's Association
Nevada Mining Association
Nevada Wilderness Project
Nevada Wildlife Federation - President
Pescio Brothers
Rocky Mountain Elk Foundation - Less Smith
Ruby Lake Resort
Sierra Club - Chapter Chair
Southern Nevada Water Authority - Brandon Humphries, Bernard Petersen, Kimberly Reinhart,
Maria Ryan
Sniper Resources
Steptoe Ranch - Don Phillips
Tumbling JR Ranch
University of Nevada Cooperative Extension - Dan Nelson, Seth Urbanowitz
Wells Progress
Western Watersheds - Katie Fite
White Pine County Clerk - Linda Burleigh
White Pine County Commission
White Pine County Community and Economic Development - Jim Garza
White Pine County Public Land Users Advisory Committee - Craig Baker
White River Ranch
WHOA
XJ Ranch - Robert Burrows

5.4 AGENCIES

The following agencies were included in the mailing list during the scoping process:

Nevada Department of Wildlife - Curtis Baughman, D. Bradford Hardenbrook, Alan Jenne, Rory
Lamp, Caleb McAdoo
Nevada Division of Forestry

Nevada Division of Forestry - Resource Management Office
Nevada State Clearinghouse
United States House of Representatives - Representative Mark Amodei
United States Fish and Wildlife Service - Ruby Lake National Wildlife Refuge
United States Fish and Wildlife Service - Jill Ralston
United States Senate - Senator Dean Heller, Senator Harry Reid

6.0 LIST OF PRIMARY PREPARERS

BLM Staff members from the BLM, Ely District Office, the USFS Humboldt-Toiyabe National Forest Mountain City and Ruby Mountains Ranger Districts, and JBR/Stantec who contributed to this document are listed in the tables below.

Table 6.0-1 Bureau of Land Management Preparers

Name	Responsibility
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Renee Barlow	Cultural Resources / Archaeology
Kurt Braun	Cultural Resources / Archaeology
Randy Johnson	Hazardous Materials / Public Safety
Stephanie Trujillo	Lands / ROW
Miles Kreidler	Minerals / Mining
Travis Young	NEPA Compliance
TJ Mabey	Noxious and Invasive Weeds
Chris McVicars	Noxious and Invasive Weeds
Scott Standfill	Rangeland Resources / Livestock Grazing
Garrett Swisher	Rangeland Resources / Livestock Grazing
Erin Rajala	Recreation / Visual Resources
Elvis Wall	Tribal Coordination
Ruth Thompson	Wild Horses
Emily Simpson	Wilderness / Wilderness Characteristics
Marian Lichtler	Wildlife / Migratory Birds / Special Status Species

Table 6.0-2 United States Forest Service Preparers

Name	Responsibility
Troy Phelps	USFS Team Lead / Fire Management
Wendy Fuell	District Ranger
Matt Boisseau	Deputy District Ranger
Jose Noreiga	Acting District Ranger
Dirk Netz	Botany
Chimalis Kuehn	Cultural Resources / Archeology
Cheri Howell	Ecology
Sean Basso	Fire / Fuels
Robin Wignall	Hydrology / Soils
Nate Millet	Hydrology / Soils
Doug Clarke	NEPA Compliance
Birk Roseman	Range / Grazing
Nancy Taylor	Recreation / Visual Resources
David Reis	Recreation / Visual Resources
Fred Frampton	Tribal Coordination / Archeology
Brett Glover	Weeds
Kyra Walton Reid	Wildlife

Table 6.0-3 JBR/Stantec Preparers

Name	Responsibility
Kristi Schaff	Project Manager
Erica Freese	Assistant Project Manager Vegetation Resources / Non-native, Invasive and Noxious Species / Special Status Species / Native American Religious Concerns / Human Health and Safety / Inventoried Roadless Areas
Diana Eck	Resource Specialist - Visual Resources / Cultural Resources / Air Quality / Climate Change / National Historic Trails / Rangeland Resources / Wild Horses
George Dix	Resource Specialist - Recreation / Visual Resources
Chris Jasmine	Resource Specialist - Wildlife / Special Status Species / Migratory Birds
Steve Morton	Resource Specialist - Recreation / Cumulative
Jason Trook	GIS Specialist
Jasmine Vittori	Resource Specialist- Soils and Hydrology / Water Quality / Wetland and Riparian Zones

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FIGURES

APPENDIX A

Scoping Comment Matrix

APPENDIX B

Pipe-rail Fence and Fence Marker Construction Specifications

APPENDIX C

State Historic Preservation Office Programmatic Agreement

APPENDIX D

Special Status Plant Survey Report for Overland Pass/Big Wash Restoration Project

APPENDIX E

Weed Risk Assessment

APPENDIX F

Hydrology Best Management Practices

APPENDIX G

Key Observation Point Photos