Environmental Assessment (DOI-BLM-ID-B030-2016-0003-EA)

BLM

Soda Fuel Breaks Project

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1.0 Introduction

1.1 Background

The Soda Fire is the largest wildfire recorded in Southwestern Idaho, continuing recent trends in increasing frequency and size of very large wildfires in southwestern Idaho and southeastern Oregon. The amount of upper elevation sagebrush steppe (4,500-6,500 feet) consumed by the Soda Fire is unprecedented, particularly in northern Owyhee County, Idaho. The Soda Fire destroyed private and public infrastructure, threatened multiple communities, and consumed valuable wildlife habitat (sagebrush and bitterbrush communities). The impact to vegetative communities has left the system vulnerable to the spread/increase in invasive annual grasses and an increase in fire frequency. The fire burned a total of 279,144 acres in Owyhee (Idaho) and Malheur (Oregon) counties (Figure 1-1).

After the fire, a BLM Interdisciplinary Team (IDT), which included local resource specialists from the Owyhee Field Office (BLM Idaho) and Malheur Field Office (BLM Oregon), assessed values affected by the fire. The team consisted of individuals representing hydrology, soils, geology, cultural resources, wildlife, vegetation, fisheries, recreation, rangeland management, engineering, hazardous materials, noxious weeds, fuels, and geographic information systems (GIS). Data from the field assessments were compiled, and added to existing, pre-burn information to identify values threatened by potential post-fire effects. The timelines associated with emergency response planning required a rapid assessment of post-fire changes to values at risk at a landscape level. Information was generated from field reconnaissance, review of relevant literature, management plans, GIS databases, and discussions with stakeholders. Based on report assessments from each specialist group, threats and primary objectives were identified and detailed in the BLM Post-Fire Recovery Plan Emergency Stabilization and Burned Area Rehabilitation 2015 Plan (Soda Fire ESR Plan).

As identified in the Soda Fire ESR Plan, a system of fuel breaks is needed to minimize the threat of wildfire to human life and property; the threat of wildfire in rehabilitation efforts and investments in the burned area; and the threat of wildfire to habitat within and outside of the burned area.

Values at Risk

- Wildland Urban Interface (WUI) areas
- Public and private infrastructure (e.g., outbuildings, fences, comm. towers, power poles)
- Vegetation/habitat rehabilitation investments (e.g., seedings, seedling plantings within burn perimeter)
- Sage-grouse and other wildlife habitat within and adjacent to burn

Threats to Values at Risk

- Wildfire (short- and long-term)
- Altered fire regime (i.e., increase in fire frequency and rates of spread) promoting/exacerbating spread of disturbance related species (e.g., cheatgrass, medusahead) (long-term)

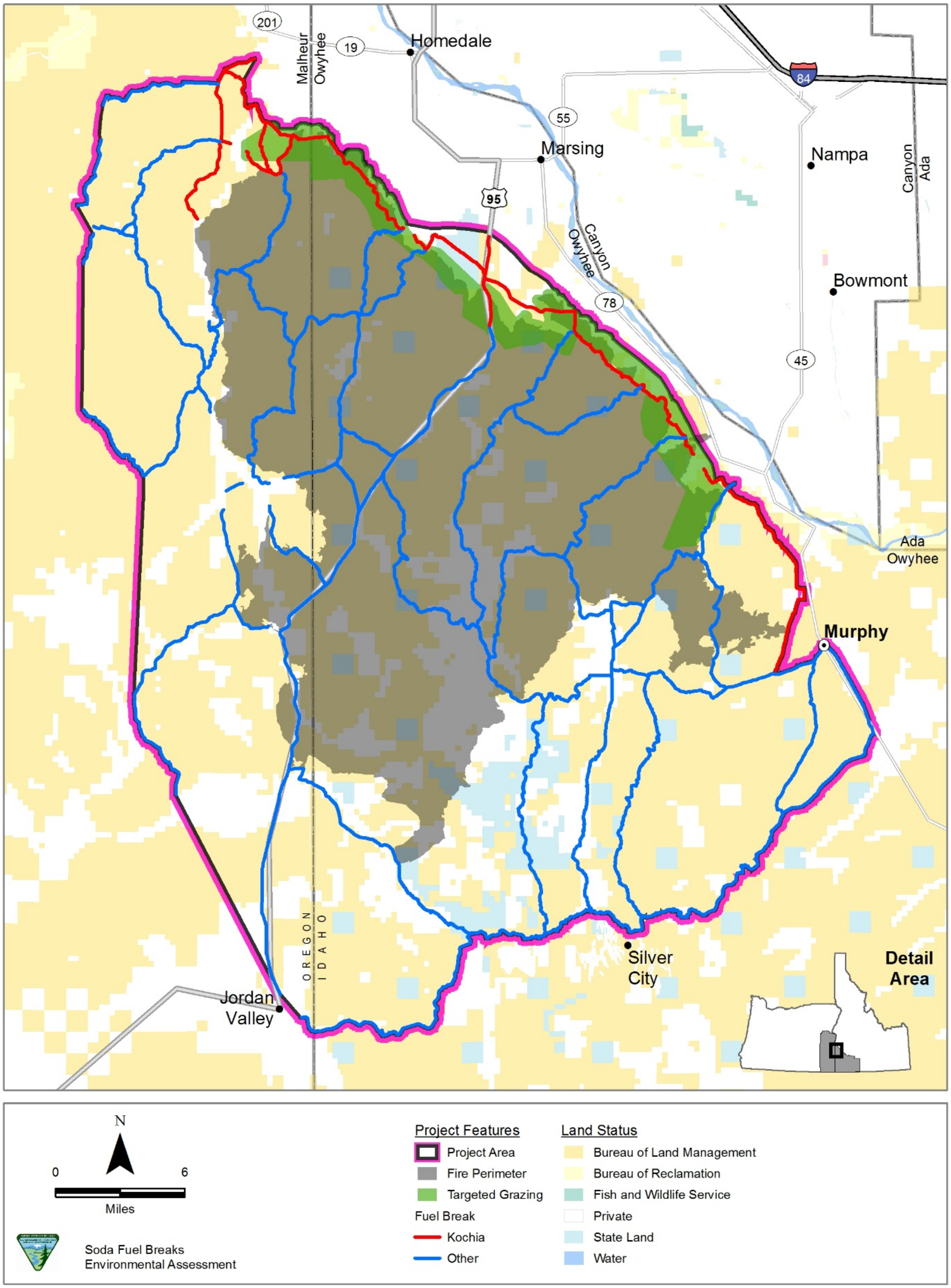

Figure 1-1: Project area.

1.1.1 Fire Behavior and Fuel Breaks

Established priorities for fire suppression considerations are life, property, and natural resources, respectively. Wildland fires away from the wildland/urban interface during multiple fire outbreaks cannot always receive sufficient suppression resources to extinguish the fire. Proactive actions such as fuel breaks provide fire suppression resources with opportunities to safely engage wildfires and to be more effective across a larger area with potentially fewer resources.

The National Wildfire Coordination Group (NWCG) defines fuel breaks as “a natural or manmade change in fuel characteristics which affects fire behavior so that fires burning into them can be more readily controlled” (NWCG 2012). Pro-active measures such as fuel breaks help to alleviate the amount of resources necessary to contain a fire in WUI areas and allow more suppression forces to be allocated to protect life, property, and important habitat in outlying areas. Fuel breaks are designed to reduce flame lengths, slow the spread of fast moving wildfire, and provide opportunities for firefighters to gain control of or contain a fire.

Research and decades of fire suppression experiences indicate fuel breaks have the potential to slow fires enough for suppression crews to control the incident, or alter fuel sufficiently to limit fire spread (Monsen and Memmott 1999). Boise and Vale District BLM fire personnel have observed the effectiveness of established fuel breaks. Boise District have shown that established fuel breaks provided a greater margin of safety for firefighters, effectively reduced flame lengths, and slowed the progression of wildfires (e.g., 2006 Ditto Rest, 2011 South Sim, and 2012 MM86 fires).

1.2 Purpose and Need for Action

The Soda Fire was the largest wildfire recorded in northern Owyhee County, continuing recent trends in increasing frequency and size of very large wildfires in southwestern Idaho and southeastern Oregon. The acreage of upper-elevation sagebrush steppe (4,500-6,500 feet) consumed by the Soda Fire is unprecedented, particularly in northern Owyhee County, Idaho. The Soda Fire destroyed private and public infrastructure, threatened multiple communities, and consumed valuable wildlife habitat (sagebrush and bitterbrush communities). As a result, the Soda Fire tripped a hard trigger included in the Idaho & Southwestern Montana Greater Sage-Grouse Approved Resource Management Plan Amendment (MD SSS 17) adaptive management strategy that requires Important Habitat Management Areas (IHMA) to be managed as Priority Habitat Managements Areas (PHMA) within the Biologically Significant Unit (BSU) of the Idaho West Owyhee Conservation Area. Overall, the impact to vegetative communities has left the ecosystem vulnerable to the spread/increase in invasive annual grasses, the creation of continuous fuel loads that will be more likely to catch and carry fire, in turn, create the high potential for an increase in fire frequency and fire size in the area.

After the fire, the BLM undertook massive Emergency Stabilization and Rehabilitation (ESR) efforts including seeding and seedling planting as the initial steps toward restoration and improvement of the sagebrush-steppe habitat impacted in the Soda Fire. Newly planted perennial grasses, forbs, and shrubs could become vulnerable to repeated wildfire if non-native invasive annual grasses become established in the affected area. Therefore, the purpose or goal of the fuel break project is to protect the investment of ESR efforts, to protect surrounding intact sage-grouse habitat, to protect private land in the WUI area, and to stem the subsequent threat of invasive plant expansion within and adjacent to the fire.

There is a need to limit the ability of wildland fires to burn into the Soda Fire restoration area from the outside and to limit the ability of wildfires from starting inside the fire restoration area to burn out into intact native vegetation. Strategically placed fuel breaks within and outside the Soda Fire perimeter (see Figure 1-1) would meet this need. Fuel breaks enhance fire suppression efforts by (1) providing tactical and logistical opportunities to fire personnel, including easy and efficient access to fire prone areas, (2) compartmentalizing areas between fuel breaks to contain wildfires into more manageable units, and (3) minimizing fire spread after ignition. Fuel breaks, if implemented and maintained, provide fire suppression personnel with an opportunity to safely engage wildfires and to more effectively attack wildfires across a larger area with fewer resources. A system of fuel breaks created by a combination of mechanical, chemical and biological treatments would protect ESR investments, human life and property, and remaining habitat by reducing the spread of future fires, including human-caused fires ignited near the highway and agricultural lands in the burned area. This system of fuel breaks is also needed to restore and protect sagebrush cover within Idaho West Owyhee Conservation Area for the overall conservation of greater sage-grouse and this project is intended to be in place for as long as it takes for the habitat to be restored to desired management levels.

The Department of the Interior has interagency standards for fire and fire aviation operations, which are composed of orders. Standard firefighting Order # 3 states to "Base all actions on current and expected behavior of the fire" and Order #10 states to "Fight fire aggressively, having provided for safety first." These orders, along with others, are the basis any fuel break strategy. Strategically placed fuel breaks across the landscape serve to modify fire behavior (lower flame length or rate of spread) while the fuel break increases firefighting safety by providing areas of reduced fuel concentrations and reduced fuel continuity. Fuel breaks also provide quicker ingress and egress for firefighting personnel and required equipment such as dozers and fire engines.

Fuel breaks must be designed to address an expected or predicted fire behavior event such as the fire behavior experienced during the Soda Fire. Important fire behavior characteristics that need to be accounted for include flame length, rate of spread, fire line intensity, spotting distance, and residence or flaming front duration.

Fuel breaks must be designed to address specific fuels conditions on the ground taking into account the expected weather parameters (wind, temperature, and pH) and fire behavior to be addressed. Once the fuels, weather conditions, and expected fire behavior is identified, the specifications of a fuel break can be addressed.

Currently the Department of the Interior is catching 97% of wildfires during initial attack; it is the 3% that are escaping initial attack (such as the Soda Fire) that the fuel breaks are designed for.

Fuel breaks must meet four criteria to provide benefit to the fire community:

- Landscape level – at a scale commensurate with the wildfire issue

- Strategic for fire resources – located where firefighters want them and are going to use them. Firefighters must have confidence in the location and design or the fuel breaks will not be used.
- Timely – the fuel breaks need to be in place when the fire community needs them which is the fire season during June through mid-September in the Boise and Vale Districts.
- Logistically feasible and affordable – if the fuel breaks are difficult to implement and too expensive, they will not be carried into the future.

1.3 Conformance with Applicable Land Use Plans and Other Related Documents

Fuel breaks methods identified in the proposed action are consistent with the following applicable land use plans, as amended:

Land Use Plans

- Owyhee Resource Management Plan (RMP), 1999
- Southeastern Oregon RMP, 2002
- Snake River Birds of Prey National Conservation Area (NCA) RMP, 2008
- Approved Resource Management Plan Amendments (ARMPA) for the Great Basin Region Sage-Grouse Sub-regions (Idaho & Southwestern Montana, Nevada and Northeastern California, Oregon, and Utah), 2015

Conformance of the proposed action and alternatives with management direction contained in the Owyhee RMP, Southeastern Oregon RMP, Snake River Birds of Prey NCA RMP, and ARMPA for the Great Basin Region Sage-Grouse Sub-regions (hereafter referred to as Sage-Grouse ARMPA) is presented below.

Owyhee RMP

Although the Owyhee RMP does not specifically discuss fuel breaks, fuel breaks are exclusively constructed for the purpose of suppressing wildfire, which is discussed and allowed in the Owyhee RMP. The proposed action is in conformance with the following Owyhee RMP objectives:

- Improve unsatisfactory and maintain satisfactory vegetation health/condition on all areas.
- Maintain or enhance the condition, abundance, structural stage and distribution of plant communities and special habitat features required to support a high diversity and desired populations of wildlife.
- Improve and maintain perennial stream/riparian areas to attain satisfactory conditions to support native fish.
- Manage special status species and habitats to increase or maintain populations at levels where their existence is no longer threatened and there is no need for listing under the Endangered Species Act (ESA) of 1973, as amended.
- Suppress wildfires by taking appropriate management response utilizing the range of acceptable acreage limits listed for each fire management zone within the resource area.

The current Fire Management Plan is reviewed periodically and may be revised in conformance with the RMP.

- Ensure that BLM controlled management actions do not exceed the National Ambient Air Quality Standards by airshed as established in the Clean Air Act and administered by guidelines in the State Implementation Plan, when in place, and the Environmental Protection Agency's (EPA) "Prescribed Burning Background Document and Technical Information Document for Prescribed Burning Best Available Control Measures" or EPA's Smoke Management Best Management Practices.
- Modify standard suppression techniques to protect sensitive resource values.

Southeastern Oregon RMP

The proposed action is in conformance with the following Southeastern Oregon RMP objectives:

- Provide an appropriate management response on all wildfires, with emphasis on minimizing suppression costs, considering fire fighter and public safety, benefits, and values to be protected consistent with resource objectives.
- Restore, protect, and enhance the diversity and distribution of desirable vegetation communities, including perennial native and desirable introduced plant species. Provide for their continued existence and normal function in nutrient, water, and energy cycles.
- Manage big sagebrush cover in seedings and on native rangelands to meet the life history requirements of sagebrush-dependent wildlife.
- Control the introduction and proliferation of noxious weed species and reduce the extent and density of established weed species to within acceptable limits.
- Manage public land to maintain, restore, or enhance populations and habitats of special status plant species. Priority for the application of management actions would be: (1) Federal endangered species, (2) Federal threatened species, (3) Federal proposed species, (4) Federal candidate species, (5) State listed species, (6) BLM sensitive species, (7) BLM assessment species, and (8) BLM tracking species. Manage in order to conserve or lead to the recovery of threatened or endangered species.
- Restore, maintain, or improve habitat to provide for diverse and self-sustaining communities of fishes and other aquatic organisms
- Maintain, restore, or enhance riparian areas and wetlands so they provide diverse and healthy habitat conditions for wildlife.
- Manage upland habitats in forest, woodland, and rangeland vegetation types so that the forage, water, cover, structure, and security necessary for wildlife are available on the public land.
- Manage public land to maintain, restore, or enhance populations and habitats of special status animal species. Priority for the application of management actions would be: (1) Federal endangered species, (2) Federal threatened species, (3) Federal proposed species, (4) Federal candidate species, (5) State listed species, (6) BLM sensitive species, (7) BLM assessment species, and (8) BLM tracking species. Manage in order to conserve or lead to the recovery of threatened or endangered species.

Snake River Birds of Prey NCA RMP

The proposed action is in conformance with the following NCA RMP objectives:

- Emphasize maintenance, protection, and enhancement of raptors and other sensitive wildlife populations and habitats.
- The distribution, abundance, and vigor of special status plants (SSP) will be maintained or improved.

Sage-Grouse ARMPAs

Management decisions and required design features (RDF) contained in the ARMPA were incorporated into the action alternatives. The action alternatives are currently being reviewed for in conformance with the ARMPA. Applicable management decisions are listed in Appendix A and design features are included in Chapter 2. A preliminary review of the proposed anthropogenic disturbance suggests that the project area is well below the 3 percent cap. However, a more exact calculation of existing disturbance is ongoing and will be part of the final EA. Applicable management decisions are listed in Appendix A and design features are included in Chapter 2.

Other Applicable BLM Plans

Fuel breaks methods identified in the proposed action are consistent with the recommendations, guidance, and methods identified in the following BLM plans and decisions:

- 2007 Vegetation Treatments Using Herbicides on BLM Lands in the 17 Western States Programmatic EIS (PEIS) and Herbicides Approved for Use on BLM Lands in Accordance with the 17 PEIS Record of Decision (ROD) – May 14, 2014 update
- 2016 Final PEIS for Vegetation Treatments Using Aminopyralid, Fluroxypyr, and Rimsulfuron on BLM Lands in 17 Western States DOI-BLM-WO-WO2100-2012-0002-EIS
- Vegetation Treatments Using Herbicides on BLM Lands in Oregon Final Environmental Impact Statement (2010) and Record of Decision (2010)
- Vale District Normal Fire Emergency Stabilization and Rehabilitation Plan Environmental Assessment (EA) 2005
- Boise District Normal Fire Emergency Stabilization and Rehabilitation Plan EA 2005
- Buzzard Complex Fire Emergency Stabilization and Rehabilitation Plan EA DOI-BLM-OR-V040-2014-0076-EA
- Boise District Noxious and Invasive Weed Treatment EA 2007
- Vegetation Treatments Using Herbicides on BLM Lands in Oregon FEIS 2010
- Vale District 5 Year Integrated Weed Control Plan EA (OR-010-89-19, 1989)
- Vale District Fire Management Plan 2015 (A 2009 plan updated annually)
- Boise District Fire Management Plan (2011)

Other Related Documents

- National Greater Sage-Grouse Conservation Measures/Planning Strategy.
- Sage-grouse Management Plan Owyhee County, Idaho (2000, amended 2013)

- Oregon Executive Order No. 15-18 which sets forth the Oregon Sage-Grouse Action Plan (Sage-Grouse Conservation Partnership 2015)
- Idaho Executive Order No. 2015-04 which sets forth the Idaho Sage-Grouse Conservation Plan as the Governor's Alternative (E) from the Idaho and Southwestern Montana Greater Sage-Grouse Proposed Land Use Plan Amendment and FEIS (June 2015)
- Idaho State Board of Land Commissioners Greater Sage-Grouse Conservation Plan (April 2015).
- Secretarial Order 3336 (January 2015), Rangeland Fire Prevention, Management and Restoration
- Greater Sage-Grouse Wildfire, Invasive Annual Grasses & Conifer Expansion Assessment (Fire and Invasive Assessment Tool (FIAT)) (June 2014).
- Natural Resources Conservation Service (NRCS) Sage-grouse Initiative, Conservation Practice Standard for Firebreaks (September 2010)
- Inland Native Fish Strategy (INFISH) for the Intermountain, Northern, and Pacific Northwest Regions (USDA FS, 1995)
- The Migratory Bird Treaty Act of 1918, as Amended, and Executive Order 13186
- Interim Golden Eagle Technical Guidance: Inventory and Monitoring Protocols; and Other Recommendations in Support of Golden Eagle Management and Permit Issuance (Pagel et al. 2010)
- Idaho Information Bulletins No. ID-2010-039, Seasonal Wildlife Restrictions and Procedures for Processing Request for Exceptions On Public Lands in Idaho.
- Idaho's Standards for Rangeland Health and Guidelines for Livestock Grazing Management
- Herbicide Formulations Approved for Use on BLM Lands in Accordance with the 17 Western States PEIS ROD – May 14, 2014 update.
- National Seed Strategy (August 2015).

1.4 Relationship to Statutes, Regulations, and Other Requirements

During the preparation of this EA, the following documents were consulted because they help to reduce redundant analysis. These documents are incorporated by reference because they cover similar issues, effects, and/or resources. The documents analyzed similar issues at a broader scale, which allows a more narrow focus for the analysis of the proposed Soda Fuel Breaks project.

- Proposed chemical treatments would be tiered to the 2007 Vegetation Treatments Using Herbicides on BLM Lands in the 17 Western States Programmatic EIS (PEIS) and Herbicides Approved for Use on BLM Lands in Accordance with the 17 PEIS ROD – May 14, 2014 update. The ROD for the PEIS and the 2014 updated list of herbicides identified herbicide active ingredients that were approved for use on BLM lands and standard operating procedures to use when applying herbicides. Only herbicide active ingredients approved for use in the ROD and updated 2014 list would be utilized. Herbicide treatment activities in the Proposed Action would follow the applicable Standard Operating Procedures identified in the ROD.

- Noxious weed management would comply with the 1989 Vale District 5 Year Integrated Weed Control Plan EA (OR-010-89-19, 1989). This EA covers four authorized herbicides for identified noxious weeds only on public lands in Vale District.
- The Vale District has released (February 2016) for public comment the *Integrated Invasive Plant Management Environmental Assessment (DOI-BLM-ORWA-V000-2011-0047-EA).* The Vale District is currently reviewing comments received on this EA and will be responding to – and incorporating as appropriate – comment responses. It is anticipated that the District EA will be finalized with Decision Record near the end of Fiscal Year 2016. The Soda ESR EA and the Vale District step down EA will be considered to ensure consistency, appropriate design features, best management practices, etc.
- The Fire Management Plans (FMP) for the Boise District and the Vale District were reviewed for fire ecology, values at risk, and priorities relative to fire suppression and fuels treatments. The proposed action covers a portion of the Vale District's Owyhee East Fire Management Unit (FMU), and the Northern/Silver City, Owyhee Front, and Birds of Prey FMUs on the Boise District. Fire is not desired in the Owyhee East FMU due to private and agricultural land and high cover of annual grasslands, and full suppression is employed for all non-prescribed fire starts. Prescribed fire may be used in the FMU to meet resource objectives such as wildlife forage or habitat enhancement. The Owyhee Front FMU is considered a high priority for suppression due to WUI and resource concerns such as sage grouse habitat and cultural and historic sites. The Owyhee Front has a relatively low fire occurrence, and a large number of fires that do occur there are human-caused. However, fuel loading is high and recent events suggest fuel breaks are needed to ensure fires similar the Soda Fire do not become a reoccurring situation. The Northern/Silver City FMU is ranked as a moderate priority for suppression due to low concentration of WUI. It does contain a number of cultural and historic sites. The Northern/Silver city FMU has a historically relatively low fire occurrence. The Birds of Prey FMU represents a small portion of the project area on the eastern edge. It is ranked as a high priority for suppression largely due to the presence of slickspot peppergrass (*Lepidium papilliferum*) habitat. Fire history here is influenced by a relatively large number of human ignitions and high cover of annual grasses.
- **Cultural Resource Laws and Executive Orders:** The BLM is required to consult with Native American tribes to "help assure (1) that federally recognized tribal governments and Native American individuals, whose traditional uses of public land might be affected by a proposed action, will have sufficient opportunity to contribute to the decision, and (2) that the decision maker will give tribal concerns proper consideration" (U.S. Department of the Interior, BLM Manual Handbook H-8120-1). Tribal coordination and consultation responsibilities are implemented under laws and executive orders that are specific to cultural resources which are referred to as "cultural resource authorities," and under regulations that are not specific which are termed "general authorities."

  Cultural resource authorities include the National Historic Preservation Act (NHPA) of 1966, as amended; the Archaeological Resources Protection Act of 1979; and the Native American Graves Protection and Repatriation Act of 1990, as amended. General authorities include the American Indian Religious Freedom Act of 1979; the National Environmental Policy Act of 1969; the Federal Land Policy and Management Act of

1976; and Executive Order 13007-Indian Sacred Sites. The proposed action is in compliance with the aforementioned authorities.

1.5 Scoping and Development of Issues

A scoping package was sent to all interested parties on March 8, 2016. The package provided a general description of the proposed action, design criteria, and map showing the project area's outline. Comment letters were received from 5 individuals and 11 organizations. Each comment was reviewed and identified as either substantive or non-substantive. Substantive comments included those that challenged the accuracy of the information present in the scoping package; challenged the methods that would be implemented as part of the proposed action or alternatives; presented new information considered relevant to the NEPA analysis; or suggested reasonable alternatives (including mitigation) beyond those that were presented in the scoping package. Substantive comments were used in the development of the alternatives and analysis found in this EA. Non-substantive comments include, but were not limited to, comments such as open ended questions, opinions without supporting rationale, requests for analysis to be included that were not related to the proposed action under consideration (e.g., requests for the EA to assess various predator control methods or to alter the current BLM grazing permit policies), as well as comments about other projects or activities that are not relevant to the currently proposed project. These non-substantive comments were not use in development of the alternatives and analysis.

Based on the comments received and internal scoping, the following issues have been identified and addressed in this EA:

- Effects on cultural resources and other sensitive resources, such as riparian areas and special status species
- Methodology, location, width and timing for targeted grazing treatments
- Effects of road improvement on public access and recreation
- Effects on migratory birds
- Effects to lands found to possess wilderness characteristics (Oregon only)
- Natural resource concerns related to the use of prostrate kochia

2.0 Description of the Alternatives

2.1 Fuel Break Treatment Objectives

The purpose of this section is to display specific, attainable resource management objectives for the Proposed Action and alternatives. Monitoring will measure progress toward meeting the objectives. The primary objectives of the Proposed Action and alternatives include:

- *Objective 1:* Develop accessible fuel breaks using mechanical, chemical and biological treatments, where applicable.

  Rationale: To protect ESR investments and remaining habitat from future fires by reducing hazardous fuels, and increasing success of proposed seeding treatments.

- *Objective 2:* Establish a plant community within the proposed fuel break areas composed of fire-resistant and resilient perennial plant materials that are low in stature and biomass. Plant materials must be competitive and able to resist cheatgrass or medusahead invasion while providing a patchy broken fuel bed that is resistant to fire spread.

  Rationale: Establishes a plant community that is self-sustaining and competitive with invasive non-native annual plants and noxious weeds. The goal of a fire-resistant fuel break is to reduce fire behavior at the point where a wildfire intersects the fuel break. An effective fuel break enhances fire suppression efforts and public and firefighter safety.

- *Objective 3:* Reduce or eliminate noxious weeds and invasive annual grasses utilizing herbicide application on the proposed fuel breaks pre- and post-treatment.

  Rationale: Control of noxious weed and invasive annual species enhances establishment and the success of the desired perennial plants by reducing competition.

2.2 Description of the Proposed Action and Alternatives

The proposed action was developed based on the Fuels Reduction treatments recommended in the Soda Fire ESR Plan. The modified proposed action was developed based on concern over indirect effects from road improvement.

2.3 Alternative 1 – No Action

Under this alternative, a fuel breaks network would not be created. Fire suppression personnel would utilize existing paved and other improved BLM and county roads and natural topographic features to hold and control wildfire.

2.4 Features Common to All Action Alternatives (Alternatives 2 and 3)

2.4.1 Methods

The methods analyzed in this EA including mechanical, chemical, fire, and biological thinning. All methods would be implemented according to the design features and stipulations outlined below. In general, all methods would be implemented alongside existing two track or improved roads.

Mowing

Where the condition of the road, terrain and vegetation would allow, a deck mower (or any mechanical equipment designed to mow brush) would be used to reduce vegetation height on sites having vegetation dominated by either grasses or shrubs on either side of strategically located roads. Mowing treatments applied to grass dominated sites would be employed during late spring/early summer to reduce grass heights prior to the fire season. Shrub mowing would occur during the cooler seasons (outside of nesting period) when fire risk is low and seasonal design features are followed. The mowing would likely be accomplished by pulling a mowing implement behind a tractor. Treatment width and residual height of mowed vegetation would be determined on a case-by-case basis, but it is expected that most mowing treatments would extend 200 feet or less on both sides of the roadway (total 400 feet).

Prescribed Fire

Occasionally prescribed fire would be necessary to burn accumulations of weeds or brush along fence lines or accumulated in topographical features such as draws or ditches associated with the proposed fuel breaks. These weed/fuel concentrations must be burned to maintain the effectiveness of the fuel break and ensure that large concentrations of weeds or hazardous fuels are not allowed to accumulate in or adjacent to the proposed fuel breaks. Burning is done in spring when surrounding green up vegetation reduces fire spread from burning fuel concentrations or in fall when surrounding live fuel moistures are high enough to reduced fire spread outside of the weed concentrations.

A project-level prescribed burn plan would be developed to describe burning parameters and address safety and smoke management. Burning prescriptions would strategically reduce undesirable effects on vegetation or soils (e.g., minimize mortality of desirable perennial plant species including sagebrush and reduce risk of annual grass invasion). All prescribed burning would be coordinated with state and local air quality agencies to ensure that local air quality is not significantly impacted by BLM activities. Prescribed fire in greater sage-grouse habitat would be subject to the following:

If prescribed fire is used in greater sage-grouse (GRSG) habitat, the site-specific burn plan would address:

- why alternative techniques were not selected as a viable options;
- how GRSG goals and objectives would be met by its use;
- how the Conservation Objectives Team Report objectives would be addressed and met;
- a risk assessment to address how potential threats to GRSG habitat would be minimized.

Hand Cutting

Often times, individual or small groups of trees or thick shrubs are within the perimeter of the desired fuel break (e.g., within 200 feet of each side of road), and the removal of those trees or shrubs is necessary to create an effective fuel break. In those situations, hand cutting individual or small groups of trees or shrubs may be utilized in concert with other methods where a few trees may limit the use of the other methods or on its own where terrain impairs the use of other methods. Trees or shrubs would be cut with chainsaws or loppers, and branches would be scattered on the ground. Hand cutting to establish fuel breaks may also be employed in areas that mechanized equipment is not feasible due to topography restricting access.

Hand cutting would also be considered where there is a need to maintain the native vegetation and visual integrity, or in sensitive areas where minimal ground disturbance is desired. In general, hand cutting would "thin" shrub canopy to an average of 5 to 10 percent in the fuel break. Shrubs would be selectively thinned using chainsaws and removed from the site, or pile burned when required conditions for burning are met (i.e., wet or frozen soils).

In areas having large amounts of residual debris following treatment, piles would be burned to reduce ground fuel loading. Hand cutting treatments would extend 200 feet or less on either side of the roadway.

Chemical Treatment

Chemical treatment would involve applying herbicides at appropriate plant growth stages to suppress or kill unwanted plants. Herbicides could be used to prepare the seedbed for a seeding, for maintenance by reducing the amount of fuel available for wildfire, and for reducing the prevalence of annual grasses in stands of perennial grass. Herbicide application would utilize truck, tractor, or utility terrain vehicle/ all-terrain vehicle (UTV/ATV) mounted sprayer as well as aerial application methods. Spot treatments may be completed using a backpack sprayer. Herbicide may be applied before or after mowing or seeding, depending on the target species and type of herbicide. Chemical application as the exclusive method of establishing or maintaining fuels breaks may also occur primarily in areas dominated by noxious and invasive weeds. If glyphosate application is used as the exclusive method, the fuel break would eventually require re-vegetation to prevent the loss of soil. Chemical treatments would occur within 200 feet or less of either side of the roadway.

Only herbicides on the List of Approved Herbicide Formulations and Adjuvants (BLM 2014 IB 2014-69) or the newest updated list are proposed for use. Analysis of proposed herbicide treatments to control targeted species is tiered to the *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* (PEIS) (USDI BLM 2007a) and the 2016 Final PEIS for *Vegetation Treatments Using Aminopyralid, Fluroxypyr, and Rimsulfuron on BLM Lands in 17 Western States* (USDI BLM 2016). For public lands in Oregon, only those herbicides authorized through the Vegetation Treatments Using Herbicides on BLM Lands in Oregon Record of Decision (2010) would be analyzed.

Vegetated Fuel Break

Areas identified for vegetated fuel breaks (i.e., green strips) may or may not require seeding, mechanical seedbed preparation such as disking or chemical treatments to reduce competition prior to planting. Disking would be accomplished for the purpose of seedbed preparation by using a rubber-tired tractor or bulldozer for pulling disks to remove vegetation exposing bare mineral soil. Disking for seedbed preparation would be followed by seed application (and possibly herbicide treatment, then seeding). Seedbed preparation may occur over multiple seasons to ensure proper site conditions and will act as temporary fuel breaks in the un-vegetated state. Use of applicable herbicides such as imazapic following mechanical treatments may occur to eliminate any later germination of invasive plants or noxious weeds. Vegetated fuel breaks may be seeded with a mix of native and non-native species above 4,000 feet elevation if it is found that seeding is necessary to compete against annual invasive species. Vegetated fuel breaks below 4,000 feet and primarily across the base of the Owyhee Front would be seeded with prostrate kochia.

Drill or broadcast seeding during the fall, winter, or spring (depending on the species) would be utilized to establish a fuel break consisting of desirable perennial vegetation where natural recovery is unlikely. Rangeland drills or no-till drills may be utilized to seed proposed grass, forb, and shrub mixtures after seedbed treatments (e.g., herbicide, disk plowing). The rangeland drill was developed to seed rough rangeland sites. The rangeland drill is typically used in open, relatively flat topography that is fairly absent of larger rocks (8-10" in diameter). This method works well in most soil types and is the primary seeding method that would be used. A no-till drill may be utilized where less rocky conditions allow its use, or where resource constraints require its use. The advantage to using the no-till drill is less soil disturbance; however, no-till drills are not readily available and can only be used in non-rocky soils. The drill seeding method has the greatest probability of seeding success among various seeding tools and methods. Broadcast seeding would be utilized where the terrain is not conducive to drill seeding. Broadcast seeding would be followed with a cover treatment using a harrow, culti-packer or roller packer implement wherever possible. Mechanical treatments would occur within 200 feet of either side of roadways.

Seeded Fuel Break Criteria and Species Information

The most effective characteristics for fuel break vegetation include (St John and Ogle 2009):

- adapted or adaptable to the site
- competitive with annual grasses and forbs
- easy to establish
- low stature with an open canopy
- resilience and regrowth capabilities after fire and grazing
- reduce fuel accumulation and volatility
- retain moisture and remain green through the fire season

To enhance establishment potential, cultivars specifically developed for use within the area would be selected. Establishment of fuel break-specific vegetation requires reduction or elimination of existing vegetation to decrease competition. Methods that may be used for seedbed preparation include disking, mowing, and herbicide application. Equipment selection would be dependent on soil type and seed requirements to ensure seeds are deposited at the required soil depth. Cultivars specifically developed for use in the treatment area may consist of one or more of the following species (but not limited to) in a given seed mix:

<u>Prostrate kochia</u> is a non-native, semi-evergreen sub-shrub originating from central Eurasia. It is well adapted to arid regions and has been effectively used across southern Idaho for almost thirty years, including several fuel break projects around Boise and Mountain Home (Pellant 1992; Harrison et al. 2002). Prostrate kochia re-sprouts from the base following fire (McArthur et al.

1990, Harrison et al. 2002) and is competitive against invasive annual grasses and forbs (Tilley et al. 2012). Prostrate kochia when established in pure stands within the fuel breaks will also create bare spaces between plants, which further enhances the effectiveness of the fuel break by breaking the fuel continuity between individual plants. This results in the flame front being broken apart and slowed down as it travels from plant to plant.

Sandberg bluegrass is a short-statured, native perennial bunchgrass that perpetuates itself through prolific seed set and shatter. Sandberg bluegrass initiates growth early in the spring, around the same time as cheatgrass. It increases in density under heavy grazing and is an early colonizing species on disturbed sites; it occupies interspatial areas in plant communities, which can deter encroachment of cheatgrass (Monsen et al. 2004, Davies and Svejcar 2008). Sandberg bluegrass is a common grass in the project area and across southern Idaho and eastern Oregon.

Bottlebrush squirreltail is a mid-statured native perennial bunchgrass. Its persistence in a plant community is dependent on its ability to reseed itself. Bottlebrush squirreltail occurs naturally throughout the project area and cultivars are available that are adapted to the project area. This species germinates in fall or spring, initiates annual growth in early spring and does not enter complete dormancy in summer, remaining partially green throughout summer and into the fall.

Crested wheatgrass is a non-native perennial bunchgrass adapted to the project area. It has been used across southwest Idaho and eastern Oregon for many years. Crested wheatgrass remains green into the growing season and tends to exclude competition from other plants in established stands, developing wide spacing between the plants once established, making it a beneficial species in fuel breaks.

Targeted Grazing

Targeted grazing is the purposeful application of a specific species of livestock at a determined season, duration and intensity to accomplish defined vegetation or landscape objectives (ASI 2006). Targeted grazing requires the use of livestock at a high intensity over a short duration to remove fine fuels. Targeted grazing may be implemented as a stand-alone treatment or in concert with other treatments such as green strips or crested wheatgrass seedings and may occur more than once a year for the life of the project. Targeted grazing may require temporary facilities for implementation such as water haul sites, temporary and permanent fencing, and salt or mineral supplementation. Livestock class would be restricted to cattle to protect bighorn sheep from potential disease transmission. Targeted grazing of the proposed fuel breaks will meet the four criteria to provide benefit to firefighters.

Targeted grazing treatments would:

- use existing roads as much as possible without reducing the continuity required to reduce wildfire spread within the targeted grazing zone
- result in a residual annual grass height of 2 inch stubble or less
- could occur during any season and would be established by June 30 to ensure effectiveness during the fire season
- be focused in areas dominated by annual or non-native perennial grasses
- require livestock exclosure fencing to reduce impacts to riparian areas
- be restricted to cattle to prevent disease transmission to bighorn sheep

- require bird ladders in all developed watering facilities
- use multiple watering and supplement sites concurrently to ensure treatments could be completed in a timely manner
- require watering and supplement sites to be removed once treatment objective are achieved
- rely on water haul sites for all livestock watering locations
- require all equipment (other than non-electric fencing) to be removed after the treatment period is complete

2.4.2 Maintenance

The fuel breaks would be periodically maintained over the life of the project (at least until greater sage-grouse habitat objectives are met) to keep tall-statured shrubs from dominating treated areas. Invasive non-native annual plants and noxious weeds would also be managed to keep them from invading and dominating the fuel breaks.

Maintenance would consist of mowing or hand cutting shrubs as well as use of herbicides within the fuel break. Mowing would occur during cooler seasons when fire risk is low (outside of nesting period). Herbicides would be utilized to manage the incidence of invasive non-native annual plants and noxious weeds within the fuel break, if necessary. Herbicides may also be used on shrubs in mowing areas for maintenance purposes.

2.4.3 Livestock Grazing Management

Seeded areas within fuel breaks (e.g., a vegetated fuel break) may be rested from livestock grazing as needed to promote establishment of seeded species. Seedling and young plants are vulnerable to uprooting following the first full growing season and have limited ability to recover from grazing. The following actions are oriented toward protecting these young plants and allowing the seeding to become established and capable of maintaining itself prior to resumption of livestock grazing.

Livestock may be excluded from seeded areas as needed:

- until the end of the second growing season
- until objectives for long-term viability of vegetated fuel breaks are met, or
- the seeding has been determined a failure through monitoring.

The period of time seeded areas would be rested from livestock grazing would be based on environmental conditions and the accomplishment of site-specific fuel break treatment objectives. The vegetation monitoring criteria are considered the minimum required to determine success of treatments and the resumption of grazing. Grazing use supervision of the treatment area would be done to ensure the seeding treatments are rested for the minimum rest period agreed upon and until fuel break treatment can withstand grazing pressure, or the seeding has been determined a failure through monitoring.

Primary methods for protection of treatment areas would include herding, avoidance by trailing, shutting off water sources, and removing salt or mineral sources. Temporary protection fencing could also be used as a tool to protect the seeded areas within newly created fuel breaks from livestock grazing impacts when use of the area is expected and active herding or complete closure of a pasture is not feasible. The type of fencing used could vary from a BLM standard three-strand barb wire fence to a double strand electric fence, and would be determined by the need, including type of livestock and duration of use. All fences would be constructed to BLM standards for wildlife. Fences in the proximity of sage-grouse leks would be marked according to current policy to reduce collision potential.

2.4.4 Design Features

Design features were developed to minimize or eliminate adverse impacts of the proposed action to identified resources. Resource inventories in each treatment unit would be conducted prior to treatment implementation. Specialists would determine precise locations of avoidance areas and/or where to apply other design features to protect resources during the clearance phase.

Soils

- Mowing, disk plowing, and drill seeding would not occur when soils are saturated and easily rutted or compressed.
- A minimum till drill or rangeland drill with depth bands would be used to seed fuel breaks in soils with wind erodibility index values (WEI) of 134 or greater (i.e. sandy sites) to minimize soil disturbance. Alternatively, seed may also be broadcast and chained, particularly where little disturbance is necessary or desirable for germination (e.g., prostrate kochia)
- Herbicides to control annual grasses and forbs would not be used on soils with WEI values of 134 or greater unless adequate vegetative cover is present to reduce the potential of erosion (e.g., release of perennial plants).

Vegetation including Noxious and Invasive Weeds

- Disturbed areas would be monitored for noxious weeds, and appropriate treatments would be applied in conformance with the standard operating procedures identified in the Boise District Noxious Weed EA (EA#ID100-2005-EA-265) or the most current Boise District noxious and invasive weed document, the current Integrated Vegetation Management guidance (Vale District), and the ROD for the Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States PEIS (USDI BLM 2007b).
- Existing noxious weed populations may be treated prior to fuel break development or avoided to reduce the chance of spread.
- Mowing and seeding equipment, including vehicles and trailers, would be washed prior to use in the project area to reduce the potential for weed spread.
- Seeded fuel breaks would not be created in wetland or riparian zones (i.e. where riparian vegetation/hydric plants exist).
- Mowed fuel breaks would be maintained (re-mowed) when sagebrush has re-grown to an average height of 15 inches or chemically treated to keep brush from re-establishing in the fuel break.

- Debris piles created during thinning operations would be limited to 15 feet in diameter and 10 feet in height, and would be ignited when prescription burn conditions are appropriate (i.e., soils are either wet or frozen).
- Power-wash all firefighting vehicles, to the extent possible, including engines, water tenders, personnel vehicles, and ATVs prior to deploying in or near sage-grouse habitat areas to minimize noxious weed spread.
- Power-wash all vehicles and equipment involved in fuels management activities, prior to entering the area, to minimize the introduction of undesirable and/or invasive plant species.

Special Status Plants

- Field examinations (i.e., project area surveys/clearances) for special status plant (SSP) occurrences would be conducted according to BLM protocols prior to treatment implementation.
- A general avoidance buffer of 200 feet has been established around SSP occurrences (except where otherwise indicated). However, buffer distance may be increased or decreased depending on site conditions and/or treatment type and its potential to impact a given population (to be determined by botanist following field examinations and prior to treatment implementation).
- All documented SSP occurrence "avoidance areas/buffers" would be mapped (hard copy and/or on GPS devices) and/or marked with flagging prior to and during treatment operations where impacts to SSP species may occur (see section 3.4 for a description SSP occurrences)

Road Work (maintenance and improvements)

- Equipment necessary for road work would not be staged in SSP avoidance buffer.

Disking

- Disking would not occur within the SSP avoidance buffer.

Mowing

- Mowing would only occur in avoidance buffers when soils are firm to minimize ground disturbance; mower height may be adjusted to avoid damaging SSPs in these areas.
- Machinery used to chip and haul off woody debris would avoid SSPs when traveling to and from treatment areas, and would not stage operations within the SSP avoidance buffer.

Prescribed Fire and Pile Burning

- Prescribed burning would not occur within 500 feet of SSP occurrences.
- Pile burning would not occur within SSP avoidance buffer.

Herbicides

- Off-site movement of herbicides either through the air, soil, or over the soil surface would be avoided. Terrain, soil type, and vegetation would be taken into consideration when selecting herbicide type, application method, and application timing.

- Ground-based herbicide application would not occur within SSP avoidance buffer and be limited to wind conditions less than 7 miles per hour to prevent drift.
- If necessary and practical, hand sprayers may be used to apply herbicide within avoidance buffer up to 10 feet around SSP in Idaho and for plants in Oregon will follow the guidance in the Vegetation Treatments Using Herbicides on BLM Lands in Oregon FEIS 2010.

Seeding

- If seeding is planned within 200 feet of SSP occurrences, minimum-till drills would be used (to the extent possible - dictated by terrain, rockiness, etc.) to minimize disturbance.

Targeted Grazing

- Targeted grazing would take place around SSP occurrences when soils are firm.
- Water and mineral supplement sites used to attract livestock would not be placed within 100 meters of SSP locations.
- Temporary fencing would be put in place around SSP occurrences for species determined to be threatened by livestock if they are within 200 feet of targeted grazing locations.

Cultural and Paleontological Resources

- Any fuel break treatments occurring within an archeological site would be pre-approved in consultation with the Idaho or Oregon SHPO and the local Tribes.
- All cultural resource inventories would be conducted in accordance with the Idaho (2014) and Oregon/Washington (2015) State Protocol Agreements with their respective SHPOs
- No disking would occur in any known archeological site.
- Herbicides may be applied on National Register of Historic Places (NRHP) listed or eligible sites either using hand sprayers or UTV/ATV mounted sprayers. UTV/ATV use across a site would only be done when the soils are not wet or saturated. Herbicide application may not occur where it would be likely to affect rock art images or traditional Native American plant gathering areas as determined in consultation with affected tribes. UTVs/ATVs will not turn around in any site.
- Seeding in National Register listed or eligible sites would be accomplished through hand seeders or UTV/ATV mounted seeders. Seeding may be done within a site, on a case-by-case basis with a minimum till drill or a standard rangeland drill, pulled by rubber-tired tractor, with depth bands when the soils are not wet or saturated. The use of a till drill and/or standard rangeland drill and a culti-packer in any potentially eligible site shall have prior consultation with the appropriate State Historical Preservation Office (SHPO). The use of a track-driven bulldozer to pull a rangeland drill will not be allowed in any archeological site. The use of a rubber-tired culti-packer in any site would be determined on a site-by-site basis in consultation with the SHPO. Soils should be firm and the vehicle will not turn within a site. Hydromulching on a site may be acceptable provided the vehicle stays on the main road.
- Avoidance of National Register listed or eligible sites would be accomplished by flagging the site, or through construction of a temporary fence. The flagging or fencing would be removed post-treatment to avoid indicating the presence of a cultural resource and potentially drawing looters.

- Mowing, with a rubber-tired vehicle, may be allowed across an archaeological site but in no instance will the mower turn around in a site. Mowing blades will be set at 10 inches or higher.
- Tree cutting within sites will be determined on a site-by-site basis and will not include removal of root balls.
- No slash piling or pile burning will occur in any unevaluated or NRHP eligible or NRHP-listed sites.
- Prescribed fire along roads will avoid historic properties and rock art sites. If fire is proposed in an area where tumbleweeds have accumulated historic maps and previous cultural resource work in the area will be looked at to determine if any historic properties are present that require mitigation. In areas where prescribed burning is planned and cultural resource surveys are possible, those areas will be surveyed prior to any burning.
- Locations of temporary fences or placement of water troughs and/or salt blocks to assist with targeted grazing treatments will be surveyed prior to installation by a Professional Archaeologist. If historic properties are found any improvements or installations will be relocated and a protection buffer will be put around the historic property based on the type of improvement.
- Targeted grazing areas will be surveyed by a Professional Archaeologist for archaeological sites prior to turning livestock into an area. Site probability models will be used to direct surveys to areas where the potential for eligible sites is greatest.
- Installation of culverts, cattle guards or any other road maintenance treatment that goes beyond the current road prism or previously disturbed area will be surveyed by a Professional Archaeologist prior to construction activities. Rerouted roads will be surveyed prior to construction. Historic properties will be avoided by road maintenance activities or, if those properties cannot be avoided, they will be mitigated prior to any ground-disturbing work in coordination with the appropriate SHPO or Tribes.
- Treatments in areas with paleontological resources will be addressed on a site-by-site basis. Where significant resources exposed on the ground’s surface ground disturbing activities will be minimized to avoid adversely impacting those resources. Design features mentioned for cultural resources may also apply to paleontological resources.

Wildlife Habitat

- No repeated or sustained behavioral disturbance (e.g., visual, noise over 10 dbA at lek, etc.) to lekking sage-grouse from 6:00 pm to 9:00 am (until at least 2 hours after dawn) within 4 miles of leks during the lekking season (March 1-May 15).
- Avoid mechanized anthropogenic disturbance, in nesting habitat during the sage-grouse nesting season (May 1 – June 30) when implementing fuels management projects and infrastructure maintenance.
- Avoid mechanized anthropogenic disturbance, in late brood rearing habitat during the sage-grouse late brood rearing season (July 1 – October 31) when implementing fuels management projects and infrastructure maintenance.
- Avoid mechanized anthropogenic disturbance in winter habitat (November 1 – February 28) when implementing fuels management projects and infrastructure maintenance.
- Provide training to fuels treatment personnel on sage-grouse biology, habitat requirements, and identification of areas utilized locally.

- Avoid building new wire fences within 1.2 miles of occupied leks. If this is not feasible, ensure that high risk segments are marked with collision diverter devices or as latest science dictates.
- Treatments that have the potential to disturb sage-grouse habitat would not occur within 4 miles of an occupied and active lek from March 1 through July 31 to reduce the likelihood of impacts to sage-grouse reproduction including lek attendance, nesting, and early brood rearing.
- Temporary fence would be constructed a minimum of 1.25 miles from occupied and active leks and marked in accordance with current marking specifications identified in IM No. ID-100-2011-001 and guidelines specified in BLM IM 2012-043 to reduce collisions by sage-grouse and impacts to other wildlife species.
- Mowing of sagebrush and disking would not occur from February 1 through July 31 to protect nesting migratory landbirds and pygmy rabbit natal burrows.
- Surveys for pygmy rabbits would occur in potential habitat prior to mowing sagebrush. If occupied burrows are detected, mowing would not occur within 300 meters.
- No broadcast spraying of 2,4-D within 300 meters of active pygmy rabbit burrows. Only spot application would be used within 100 meters of active burrows.
- If pygmy rabbits are present, no application of herbicides within 300 meters of active burrows would occur from one hour before sunset to one hour after sunrise, to minimize the potential for direct contamination.
- Herbicides with the lowest likelihood of impacting wildlife would be used whenever possible. Herbicides that can cause harmful effects to wildlife would not be applied at the maximum rate.
- Seasonal restrictions for potentially disruptive construction or other activities within big game winter ranges in Idaho typically will apply from November 15 through April 30 unless a temporary, short-term exception is granted by the BLM field office manager. General time-frames for calving/fawning are May 1-June 30 for elk and deer and May 15 through June 30 for pronghorn. Seasonal restrictions within bighorn sheep lambing areas will apply from approximately April 15 to June 15.
- Surveys for raptor nesting activity, including known sites, would be completed two miles out from any site with proposed mechanized equipment operation (tractors, chainsaws) or anthropogenic disturbance between January 1 and April 30.
- Raptor nest sites identified as active during that period would be protected by establishing a 0.5-mile buffer around the nest. Active ferruginous hawk and peregrine falcon nests would be protected by establishing a 1.0-mile buffer around the nest. Established buffers would remain in effect from determination of an active nest through July 31, unless the nest is abandoned, destroyed (wind, lightning, wildfire), or the young fledge before July 31. In addition, BLM can consider topographic or other factors that are biologically reasonable to modify the spatial and/or temporal buffers.
- No treatments incorporating soil disturbance, herbicide application, or vegetation removal would occur within the identified riparian/aquatic buffer to protect riparian habitat and aquatic life.
- Use Best Management Practices and soil conservation practices during project design and implementation to minimize sediment discharge from treatments (i.e. mowing activities, disking, seeding, etc.) into streams, lands and wetlands to protect designated beneficial uses.

- Avoid heavy equipment in or within 300 feet of the margins for all springs/seeps/riparian habitats (including wet meadows) to prevent soil compaction.
- Avoid removal of vegetation within all riparian areas to protect bank stability, avoid soil compaction, and reduce sedimentation.
- Avoid all riparian exclosures and identified future exclosures. Heavy equipment should stay outside of the perimeter of these areas to prevent soil compaction.

Water Resources and Quality, Wetlands, and Riparian Areas

- New road construction or reconstruction of existing roads must comply with BLM road and safety standards found in the BLM Roads Manual (9113). Standard templates for roads and drainage dips will be utilized for all construction (armored crossings, water bars, culvert installation, etc.).
- Drainage control will be ensured over the entire road through the use of drainage dips, insloping, natural rolling topography, ditch turnouts, ditches, or culverts. If culverts or drainage crossings are required, they will be at least 18 inch diameter or designed for a 50-year or greater storm frequency (whichever is larger in diameter), without development of a static head at the pipe inlet. Pipe outlets will disperse flows across a wide area to prevent scour and erosion. Culverts within drainage channels should be in line with the natural gradient of the stream channel. Relief culverts should discharge away from natural channels into areas not susceptible to erosion.
- Installation of sediment and stormwater controls will occur before initiating surface-disturbing activities. Use suitable measures to avoid or minimize scour and erosion of the channel, crossing structure, and foundation to maintain the stability of the channel and banks. Consultation with a hydrologist or fishery biologist will occur regarding sediment and erosion control structures prior to implementation.
- Within perennial and fish bearing intermittent stream channel crossings, road maintenance or improvements will not occur during spawning, incubation, and emergence periods for redband trout (March 1 – June 15). Consultation with a fishery biologist will occur prior to implementation to ensure improvements promote fish passage and maintain habitat stability.
- Targeted grazing will not be permitted within riparian areas. Riparian areas within pastures with targeted grazing treatments will have permanent exclosures constructed.
- Livestock watering locations for targeted grazing treatments will be limited to water haul sites.
- Water haul sites and mineral supplement locations (livestock attractants) will be located at least ¼ mile away from any riparian area.

The Boise and Vale Districts use the Inland Native Fish Strategy (INFISH) for the Intermountain, Northern, and Pacific Northwest Regions (USDA FS, 1995) to identify areas where management actions may affect aquatic resources, including water quality. The INFISH provides for recommended buffer distances around Riparian Conservation Area (RCA) to reduce the overall affects management actions may have on these sensitive areas. The following is the general guidance for buffers:

- Fish bearing streams [perennial or intermittent] consist of the stream and the area on either side of the stream extending from the edge of the active stream channel to the top of the inner gorge, or to the outer edges of the 100 year floodplain, or to the outer edges of riparian vegetation, or 300 feet slope distance, whichever is greatest.

- Perennial, non-fish bearing streams consist of the stream and the area on either side of the stream extending from the edges of the active stream channel to the top of the top of the inner gorge, or to the outer edges of the 100 year floodplain, or to the outer edges of riparian vegetation [as identified by the presence of facultative species], or 150 feet slope distance, whichever is greatest.
- Ponds, lakes, reservoirs over 1 acre consist of the body of water or wetland and the area to the outer edges of the riparian vegetation [as identified by the presence of facultative species] or to the extent of the seasonally saturated soil, or unstable area, or 150 feet slope distance; whichever is greatest.
- Seasonally flowing or intermittent streams, wetlands less than 1 acre, landslides and landslide prone areas should include: the extent of the landslide/landslide prone area, intermittent stream channel and the area to the top of the inner gorge or; intermittent stream channel or wetted area and the area to the outer edges of the riparian vegetation [as identified by the presence of facultative species] or; 100 feet slope distance if in priority watershed or; to the edge of the stream channel and riparian area or 50 feet in non-priority watersheds, whichever is greatest.

These buffers were considered in determining whether vegetation treatments have the potential to have direct or indirect impacts to water quality.

Appropriate herbicide-specific buffer zones applied to downstream water bodies, habitats, and species/population areas of interest are established utilizing the INFISH RCA buffers, U.S. Fish and Wildlife Service (USFWS) past ESA consultation efforts, and Appendix C, Table C-16, of the Final PEIS.

2.4.5 Monitoring and Control

The collection of implementation and effectiveness monitoring data and information would be used to inform management whether the fuel breaks are achieving the desired goals and whether changes are necessary. Developed and effective fuel breaks would accomplish the following goals:

- Provide protection to existing and future habitat rehabilitation and restoration treatments
- Provide additional and improved anchor points for fire suppression tactics
- Enhance firefighter and public safety
- Facilitate protection of remaining intact sagebrush communities, particularly those areas associated with greater sage-grouse habitat

Implementation Monitoring

Treatment implementation monitoring is the inspection of operations during treatment implementation to document adherence to applicable design features. Implementation monitoring documents resource conditions, equipment issues, and/or resolutions, and any necessary adjustments to the prescribed designs during implementation. Information derived through implementation monitoring would be used to improve future fuel break project design.

Effectiveness Monitoring

Treatment effectiveness monitoring would be conducted to evaluate success of the treatments. The methods used to monitor the treated areas would include qualitative field observations and photo points adjacent to SSP avoidance buffers in tandem with prostrate kochia treatment effectiveness monitoring and/or weed inventory/monitoring.

Vegetation characteristics to be measured include, but are not limited to:

- average shrub height and percent canopy cover
- height, density, and presence of all species, including cheatgrass and other non-native annual plant species of concern in the treatment area
- percent ground cover

Treatment Mapping

The actual treatment footprint would be mapped immediately post-implementation using Trimble global positioning system (GPS) technology and incorporated into BLM Vegetation Treatment Geodatabases (VTG). The resulting Geographic Information System (GIS) shape-file would define the physical extent of the treatments, and aid in determining movement of plant species outside of the treatment boundaries. Plot locations along treatment boundaries would be marked with witness posts (see Monitoring Methodology below) and would be recorded using Trimble GPS technology therefore providing reference points to verify GPS accuracy.

Mowing and Hand Cutting Monitoring

Mowed or thinned fuel breaks would be monitored for regrowth (height of mowed species and density of thinned species).

- Where mowing is used to reduce shrub height to between 6 and 12 inches, retreatment would be scheduled when re-growth exceeds an average of 15 inches in height.
- Where hand cutting treatments would remove shrub canopy, retreatment would be scheduled when canopy cover exceeds 10 percent.

Should a wildfire start in or burn into or through the treated area, fuel break effectiveness would be evaluated per BLM Fire and Aviation Instruction Memorandum No. FA IM-2013-027, dated August 14, 2013, or future policy. This would provide evaluation and documentation of whether the fuel breaks were effective in stopping or slowing the fire.

Prostrate Kochia Fuel Break Monitoring

Prostrate kochia fuel breaks would be monitored for establishment of prostrate kochia and presence of non-native invasive annual grasses and forbs. Prostrate kochia treatments would be monitored for five years to assess spread from treatment areas. If prostrate kochia is spreading outside of the treatment area an interdisciplinary team would review the data and recommend if control treatments are necessary

- Four (4) prostrate kochia plants per square meter
- <10% cover of cheatgrass in kochia interspaces
- >50% of prostrate kochia plants are producing seed

Seeded Fuel Break Monitoring

Seeded fuel breaks would be monitored for establishment of seeded species and presence of non-native invasive annual grasses and forbs.

- Reseeding would occur when the average density of desired perennial plants is less than what is effective at controlling annual plant invasions
- Four (4) plants per square meter
- <10% cover of cheatgrass in interspaces
- >50% of plants are producing seed
- If the functionality of seeded fuel breaks is compromised by the presence of undesirable vegetation, one of the analyzed treatment methods would be used to restore fuel break effectiveness

Natural Fuel Break Monitoring

Natural fuels breaks would be inspected annually to evaluate condition and presence of non-native invasive annual grasses and forbs.

- Four (4) plants per square meter
- <10% cover of cheatgrass in interspaces
- >50% of plants are producing seed
- If the functionality of seeded fuel breaks is compromised by the presence of undesirable vegetation, one of the analyzed treatment methods would be used to restore fuel break effectiveness

Targeted Grazing Monitoring

Targeted grazing fuel breaks would be monitored for effects of grazing on vegetation including treatment application and response. Studies in addition to those described below (such as utilization, phenology or production) may occur depending on funding availability and cooperators willingness to contribute technical assistance.

- Treatment application would be monitored using photo points and residual fuel height (stubble) transects following the Stubble Height methodology involving quick assessment, pace transects as described in the Interagency Technical Reference 1734-3 (USDI BLM 1999)
- Treatment response would be monitored through review of photo points and line point intercept studies

Noxious Weed Monitoring

- Treatment areas will be monitored annually for noxious weeds or invasive species for at least 3 years after treatment unless control is achieved earlier
- Noxious weeds encountered within or adjacent to the project area would be recorded and provided to the District Weeds Specialist. An appropriate treatment plan would be implemented based upon species, morphology, location and infestation size

2.5 Alternative 2 – Proposed Action

The BLM is proposing to construct approximately 452.6 miles of fuel breaks along existing roads (Figure 1-1). Roads that are currently accessible to wildland fire engines and other suppression equipment, as well as those that would produce the greatest benefit for protecting ESR treatments and habitat, would be selected for fuel break development.

The BLM proposes to develop three types of fuel breaks: prostrate kochia fuel breaks (in WUI areas), natural fuel breaks (i.e., primarily native perennial grass – no seeding), and seeded fuel breaks (native and/or non-native perennial grass – seeded). Maximum fuel break width would be up to 200 feet to either side of roads; however, environmental constraints such as adjacent vegetation, terrain, soil type, and/or resource concerns would dictate width in a given area. For example, a fuel break would be narrowed to avoid important resources. Treatments associated with development and maintenance of fuel breaks include (Table 2-1):

Table 2-1. Treatment/Activity Summary

Treatment/Activity	Miles	Acres	% BLM
Road Maintenance	452.6	1,912.1	77.3%
Prostrate kochia fuel break	68.6	3,896	84%
Other fuel break	384	21,621	76
Targeted grazing (biological thinning)	35[1]	2,006	86%

Proposed road improvement and maintenance actions would include using heavy equipment to blade or grade existing roadways to remove vegetation and improve access. Grading of road surfaces would allow for maintenance, improvement and creation of ditches and shoulders; the maximum width for any type of road improvements would average 35 feet. Maintenance of roads may also include installing culverts, constructing rolling dip gravel stream crossings, road resurfacing, installing cattleguards and sediment barriers, and surfacing areas with gravel. Some roadways may need to be permanently re-routed to allow for access of suppression vehicles. Application of pre-emergent herbicides after grading is also proposed to reduce the spread and establishment of noxious weeds. Road shoulders may be seeded with fire resistant/resilient grass and forb species in areas where seeding is deemed appropriate and additional shoulder and bar ditch maintenance is complete. Occasionally prescribed fire will be necessary to burn accumulations of weeds and brush on fencelines accumulated in topographical features such as draws or ditches. Once maintained, roads would serve as fuel breaks and offer better access for fire suppression equipment. All existing and proposed road improvements would be subject to periodic maintenance.

- Annually monitor for fire suppression access capability and maintain to established standards of approximately 452.6 miles (77% BLM lands & 23% other lands) of roads for fire suppression access that are not currently being maintained by the state or county

[1] Concentrated use would be focused along roadways as much as possible, while recognizing other areas may be subject to concentrated use to ensure continuity of the treatment to reduce wildfire spread within the targeted grazing zone. For the purposes of analysis, the concentrated use area is expected to occur within a 35 mile "zone".

- Annually maintain ditches where present

Targeted grazing fuel breaks would occur within the targeted grazing buffer (see Figure 1-1) in areas dominated by annual grasses, in crested wheatgrass seedings or in kochia fuel break areas. The targeted grazing buffer was identified along the northern portion of the project area where the majority of the WUI occurs.

2.6 Alternative 3 – Modified Proposed Action

Alternative 3 differs from the Proposed Action in that there would be no road improvement/maintenance. Management actions and design features are the same as the Proposed Action.

Under Alternative 3, the BLM is proposing to construct approximately 452.6 miles of mechanical fuel breaks along existing roads. Roads that are currently accessible to wildland fire engines and other suppression equipment, as well as those that would produce the greatest benefit for protecting ESR treatments and habitat, have been selected for fuel break development.

The BLM proposes to develop three types of fuel breaks: prostrate kochia fuel breaks (in WUI areas), natural fuel breaks (i.e., primarily native perennial grass – no seeding), and seeded fuel breaks (native and/or non-native perennial grass – seeded). Maximum fuel break width would be up to 100 feet to either side of roads; however, environmental constraints such as adjacent vegetation, terrain, soil type, and/or resource concerns would dictate width in a given area. For example, a fuel break would be narrowed to avoid important resources or rocky areas. Treatments associated with development and maintenance of fuel breaks include (Table 2-2):

Table 2-2. Treatment/Activity Summary

Treatment/Activity	Miles	Acres	% BLM
Prostrate kochia fuel break	68.6	2,317	84%
Other fuel break	384	9,454	76%
Targeted grazing (biological thinning)	35	1,701	86%

Targeted grazing fuel breaks would occur within the targeted grazing buffer (see Figure 1-1) in areas dominated by annual grasses, in crested wheatgrass seedings or in kochia fuel break areas. The targeted grazing buffer was identified along the northern portion of the project area where the majority of the WUI occurs.

2.7 Alternatives Considered But Not Analyzed in Detail

The following alternatives were considered, but not analyzed in detail because they did not meet the purpose and need as described below.

An alternative with no Prostrate Kochia Fuel Breaks

An alternative that would not utilize prostrate kochia in fuel breaks was considered but not analyzed because it did not meet the purpose and need of the project. Prostrate kochia is the plant species that best meets the criteria for fuel breaks in the WUI portion of the project area. St John and Ogle (2009) listed the most effective characteristics for fuel break vegetation as:

- adapted or adaptable to the site
- competitive with annual grasses and forbs
- easy to establish
- low stature with an open canopy
- resilience and regrowth capabilities after fire and grazing
- reduce fuel accumulation and volatility
- retain moisture and remain green through the fire season

Prostrate kochia effectively competes with invasive annual grasses and forbs (NRCS 2006). It has been shown to effectively reduce flame lengths and slow the spread of fires even in windy conditions (Harrison et al. 2002, Monsen and Memmott, 1999, Monsen 1994), which improves the opportunity for firefighters to more safely engage in effective suppression actions. Reducing flames lengths and the spread of wildfire also enhances public safety. Prostrate kochia is the plant species that best meets the desired criteria for suitable and effective fuel break vegetation (Monsen 1994; Monsen and Memmott 1999; Harrison 2002; Kettle and Davidson 2007; St John and Ogle 2009; Waldron 2011).

An alternative that would not use prostrate kochia or other non-native species (a natives only alternative)

An alternative that would not use kochia or other non-native species (native plants only) as part of the proposed fuel breaks was considered, but was not analyzed in detail because it did not meet the purpose and need of the project because they do not meet the requirements of an effective fuel break listed above (St John and Ogle 2009).

An alternative using sheep and goats for targeted grazing

An alternative that would use goats and sheep for targeted grazing was considered but not analyzed in detail because of concern for the protection of bighorn sheep from potential disease transmission.

An alternative that would consider no grazing

An alternative that would consider no grazing in the project area was considered but not analyzed in detail because it outside the scope of the EA for the project and does not meet the purpose and need of the project because removing livestock will not reduce fuel loading and protect important resources from fire spread.

An alternative that would remove grazing from sensitive areas and place limitations on any grazing use that may continue

An alternative that would consider removing grazing from sensitive areas and place limitations on any grazing use that may continue was considered but not analyzed in detail because it is outside the scope of the EA for the project and does not meet the purpose and need of the project because removing livestock from sensitive areas will not reduce fuel loading and protect important resources from fire spread.

An alternative that would consider habitat restoration with reduced grazing

An alternative that would consider habitat restoration with reduced grazing was considered but not analyzed in detail because habitat restoration efforts have already begun with implementation of the Soda Fire Emergency Stabilization and Restoration Plan and the burned area is currently being rested from grazing to allow for restoration efforts to be successful. Also, recent treatments are vulnerable to shortened fire return intervals expected because of invasive annual grasses so this alternative would no help protect important resources from fire spread.

3.0 Affected Environment and Environmental Consequences

After reviewing the Proposed Action and alternatives relative to the proposed project area, the Interdisciplinary Team determined that several elements of the human environment could potentially be affected. These elements and the expected direct and indirect impacts to the environment are discussed below. A direct impact is caused by the action and occurs at the same time or place, whereas an indirect impact is caused by the action but occurs later in time or is further removed in distance, but is reasonably foreseeable. The No Action alternative reflects the current situation within the proposed project area and will serve as the baseline for comparing the environmental effects of the Proposed Action and alternatives.

Elements of the human environment have been reviewed and the following are either not present in the project area, or would not be affected by any of the alternatives therefore, they will not be addressed further in this document:

- Wilderness Study Areas
- Economic and Social Values
- Environmental Justice
- Research Natural Areas
- Hazardous materials

For the purposes of the analysis in this EA, the impacts of past activities within the proposed project area were considered to be reflected in existing resource conditions (i.e., the affected environment). The impacts of any specific past action may be difficult or impossible to individually quantify and disclose due to issues like inconsistent data collection methodology in the past, data that have become lost or missing over time, and the lack of data in the case of unplanned events such as wildfire. Therefore, this analysis does not attempt to quantify specific impacts for each past activity within the proposed project area, but rather uses current and scientifically accurate data available to identify the existing condition of each resource. Present and reasonably foreseeable future actions within the analysis area are addressed in the cumulative impacts analysis for each resource. In addition, for purposes of the analysis in this EA, areas within the Soda Fire perimeter were analyzed as being burned by the Soda Fire, including islands of areas that were classified as unburned/very low burn. Areas outside the Soda Fire perimeter are considered unburned by the Soda Fire.

Several assumptions were made during the analysis process. These assumptions were necessary to provide a standard basis for comparison between alternatives. However, it must be stated that all treatments, including implementation and maintenance, are subject to federal budgets. Assumptions include:

- All treatments would be fully implemented as proposed.
- Seedings would be successful.
- Implementation of fuel break segments would occur at a rate of approximately 2,000 acres per year.
- Seedings may be rested from livestock use as needed for a minimum of two growing seasons to allow for successful establishment.

- Short-term effects occur within five years of implementation; long-term effects occur greater than five years after implementation

Cumulative effects describe impacts of the Proposed Action and alternatives when added with other past, present, and reasonably foreseeable future actions (40 CFR 1508.7). The cumulative effects analysis considers actions on federal, state, and private lands within the analysis area that would affect resources that could also be affected by the Proposed Action and alternatives in this EA. Past, present, and reasonably foreseeable future actions that may contribute to cumulative effects are discussed below for each potentially affected element of the human environment.

Cumulative actions that have occurred in the past and are likely to continue into the foreseeable future include:

- Gateway West Transmission Line – Gateway West Project is a proposal to construct 1,103 miles of electrical transmission lines from Glenrock, Wyoming to Hemmingway Butte in Idaho. Several routes for the transmission line have been proposed but a final decision on which routes would be used has not been made. Routes from both Segment 8 and Segment 9 passes through the project area.
- Boardman to Hemingway Transmission Line – Boardman to Hemingway Project is a proposal to construct approximately 295 miles of electrical transmission line from near Boardman, Oregon to the Hemingway Substation in Owyhee County. The transmission line route would pass through the project area.
- Soda Fire ESR Plan (USDI BLM 2015a) – The Soda Fire ESR Plan identified treatments that would occur within the project area.
- Recreation – Recreational activities include hunting, camping, biking, hiking, off-highway vehicle (OHV) use, and bird and wildlife watching
- Livestock Grazing – Livestock grazing and trailing on public, private, and state lands has occurred for more than a century, and is expected to continue into the foreseeable future. BLM grazing allotments in and adjacent to the project area are managed to achieve or make progress towards achieving the Standards for Rangeland Health. Trailing livestock occurs when livestock are moved from one location to another by herding, using horses or motorized vehicles.
- Weed treatment – Weed treatments currently occur in the project area and will continue in the foreseeable future.
- Wildfires – Wildfires have consumed native vegetation and enhanced conditions for annual grasses and forbs to invade the area.
- Climate change – The region is becoming dryer and hotter.
- Land and Realty actions (rights-of-way, easements, etc.) – Land and realty actions including granting of rights-of-way and easements as well as mineral development have occurred and will continue to occur in the future.

3.1 General Setting

The Soda Fuel Breaks proposed project area is located in Owyhee County, Idaho, and Malheur County, Oregon. Elevation within the proposed project area ranges from 2,400 to 6,000 feet above sea level. Summers are warm and dry; winters are cool with the majority of annual precipitation occurring from November through May. The average annual temperature varies between 37° and 48° Fahrenheit.

The average annual precipitation ranges from 7.8 inches at the Homedale 1 SE, Idaho [104318[2] (WRCC 2016)] to over 20 inches at the Reynolds Creek station[3] [USS0016F08S (NCEI NOAA 2016)], increasing from north to south. Precipitation data from the Reynolds[4] station (WRCC 2016) collected within the project area, indicates that the average annual total precipitation for the years 1961 to 2014 was 10.5 inches. From 2000 to 2012, yearly precipitation totals for 10 of the last 12 years have been below the 53-year average.

Cool season precipitation occurs in the form of rain or snow. Summer precipitation may occur in the form of periodic thunderstorms. More typically, summer thunderstorms are dry in nature. Lightning resulting from these storms is a common cause of wildfires in southern Idaho and eastern Oregon. Wind is common in the area, winds can exceed up to 40 miles per hour and tend to occur most frequently in the spring and summer with thunderstorm conditions. Prevailing winds blow primarily west to east, although winds blowing from east to west may precede low-pressure systems.

Since the Soda Fire burned the majority of the vegetation within the fire boundary, most of the vegetation that will regrow first is expected to be a mixture of annual and perennial grasses. As the burned area recovers over the next 5-10 years, it is expected that shrubs, willows and other woody vegetation will become more prevalent within the landscape. Most of the approximately 280,000 acres of burned area is within Important or Priority Habitat Management Areas for sage-grouse.

The unburned vegetation surrounding the Soda Fire perimeter is a mixture of sagebrush steppe habitat with some areas dominated by juniper. Invasive species are also found outside the fire perimeter. If this vegetation burns in the near future, it would then become vulnerable to repeated wildfire as non-native invasive annual grasses are expected to become established in these areas.

The Alternative 2 – Proposed Action vegetated fuel breaks and mechanical treatment acreages discussed below includes an average of 35 feet of road maintenance and improvement acreage. Alternative 3 – Modified Proposed Action does not include the 35 feet road maintenance and improvement area (assumed current condition of road will remain and acreage only includes 100’ on both sides of centerline of roads).

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[2] Homedale 1 SE is located at 2,230 feet above sea level, in Homedale, Idaho, approximately 6 miles northeast of the project area. Records were summarized from January 2000 to February 1, 2016.

[3] Reynolds is located at 5,600 feet above sea level, roughly 17 miles southwest of Melba, Idaho. Records were available from January 2000 to February 2016.

[4] Reynolds, Idaho is located at 3,930 feet above sea level, roughly 16 miles southwest of Melba, Idaho. Records were available from January 1962 to December 2014.

3.2 Wildfire Management

3.2.1 Affected Environment – Wildfire Management

The analysis area for wildfire management is the proposed project area because proposed management actions would only occur within this area. A wide range of wildfire behavior may be exhibited in the project area depending on fuels, weather and topography. Sagebrush and annual grassland fires may result in high intensity fires with rapid rates of spread, while fires in perennial grasslands are often less intense. The concentration and values of resources at risk vary throughout the project area. Fire behavior and resources at risk dictate in large part the priorities, objectives and strategies for fire management. One tool that fire managers may use are fuel breaks. These are a natural or manmade change in fuel that serve to modify fire behavior and make the fire easier to control (NWCG 2015). Fuel breaks may lower flame lengths, slow rate of spread, and provide fire fighters safe places to anchor control lines.

The portion of the project area within the BLM's Vale district falls within the Owyhee East Fire Management Unit (FMU). This area is characterized by large expanses of annual introduced grassland, as well as perennial grassland and sagebrush/bunchgrass or sagebrush/annual grasslands. Fires that ignite can spread quickly in these types of fuels and escaped fires can easily reach 20,000 acres. Many areas in this FMU have burned multiple times in the last 35 years (USDI BLM 2015b). Due to the high cover of annual grasslands and the likelihood that wildfires ignited here will spread quickly and intensely, full fire suppression strategy is in place in the Owyhee East FMU.

The portion of the project area within the BLM's Boise District falls within the Owyhee Front, Northern/Silver City, and Birds of Prey FMUs. A minor portion of the project area is within the Birds of Prey FMU, thus the FMU will not be considered in detail. The Owyhee Front FMU is characterized by GR2 (low load dry climate grasses) and GS2 (moderate load dry climate grass-shrub) fuels (USDI BLM 2011a). Wind driven fires in these fuel types can grow rapidly and exhibit high flame lengths (Scott and Burgan 2005). Many areas within this FMU have been modified significantly from their historical fire regime through the introduction of annual grasses which create a continuous and hazardous fuel bed. As more fires occur in these areas the annual grasses may increase, and the departure from the historical fire regime may grow. Grass-shrub fuels that burned with moderate to high severity may have experienced high mortality in the shrub strata. In these cases the fuel type has been converted to one where grass is the main carrier of fire currently. The Owyhee Front is ranked as high priority for fire suppression. Sage-grouse habitat, cultural resources, and WUI are the main drivers for the ranking. Fuels treatment is ranked as a moderate priority here. The reduction of non-native annual grasslands is a main concern for treatment.

The Northern/Silver City FMU is characterized by GS2, SH2 (moderate load, dry climate shrub), and TU1 (low load, dry climate timber-grass-shrub) fuels (USDI BLM 2011a). The fire regime has a moderate to high departure from the historic range, in part due to juniper encroachment. The fire history in the FMU indicates fairly low occurrence and the most common ignition source is lightening. Suppression here is ranked as a moderate priority due to remoteness and lack of WUI. The FMU is ranked as a high priority for fuels treatment, though a main driver for this ranking is concern over hazardous fuel loading near Silver City, which lies outside of the project area.

All fuel breaks must have a road free of vegetation. The road free of vegetation acts as the break in fuel continuity which is the true fuel break. All fire lines regardless of size or fire behavior have to break the continuity or availability of fuel to an advancing fire. The three components of the fire triangle are heat, oxygen and fuel (NWCG 2007). The one component that can be manipulated by man is the fuel component in the form of fuel breaks.

The road associated with the fuel break must be accessible to fire equipment such as dozers, fire engines and overhead vehicles. The logistics of fighting fire in remote locations is aided by a road network that allows the flow or resources and supplies to the fire within a reasonable timeframe. The quicker the fire resources and supplies can access the fire, the faster it can be contained. All fires must be engaged at some level from ground resources. Aerial resources may or may not be effective for slowing the advancement of fire. To completely extinguish a wildland fire, ground resources will be required. The fuel break road also improves safety to fire resources by providing quick ingress and egress in case of emergencies associated with changing fire conditions. The road also allows easy maintenance of the fuel break.

Fuel break roads provide a reduction of vegetation (change in fuel model) adjacent to the fuel break. For the fuel break to be effective, vegetation adjacent to the road must be reduced. The reduction in fuels adjacent to the road results in a change in fire behavior as the fire burns into the area of reduced fuels. Reduction in flame length and potential reduction in rates of spread are the two fire behavior characteristics modified by fuels reduction.

The fuel break width of 200 feet on both sides of the road allows to address a fire coming from any direction. As fire moves into the fuel breaks, the fire behavior is modified by reduced flame length and possibly rate of spread depending on herbaceous fuel continuity as it comes to the road/fuel break. The 200 feet of vegetation manipulation on both sides of the road significantly increases the area and time the advancing fire’s behavior is being reduced or modified; increasing time and space for the firefighters to respond to and anticipate the constantly changing fire environment.

Flame lengths of 8 feet or less are desired as fire comes to the fuel break. Empirical evidence coupled with decades of experience in fire suppression has established general rules of thumb used in determining suppression tactics based on flame length (USDA USFS 2011a). In general, a flame length of 8 feet or less is what the proposed fuel break design is based on.

During extreme fire behavior, fuel breaks can be breached by spotted across when fires contact fuel breaks. Spotting is when burning embers from the flaming front are picked up by winds and carried across the fuel break or control line into a receptive fuel bed. Spotting in fuel model GR1 (primary short grass fuel model that is proposed for the fuels manipulation zones above 4,000 feet in elevation the desired fuel model end stage within the project area). SH1 in forage kochia plantings is short range and short duration as compared to the existing fuel model GS2 (grass shrub fuel model) prior to mowing.

3.2.2 Environmental Consequences – Wildfire Management

3.2.2.1 Alternative 1 – No Action

The No Action alternative would not have a network of fuel breaks constructed throughout the project area. Future fires would burn depending on existing fuels, weather, topography, and be unimpeded by changes in the fuel bed that would alter fire behavior and decrease resistance to control. Firefighters would not have pre-established fuel breaks on the landscape to create safe and effective anchor points from which to initiate suppression tactics. Intact shrub vegetation along roadsides would likely produce high flame lengths that would not be manageable using direct attack methods. Response time required to catch fires before they grow beyond the capabilities of initial attack would remain unchanged and landscapes more distant from improved roads with intact sagebrush steppe would remain most vulnerable to large fires. Increases in cover of annual grasses which may result from recent large fires including the Soda Fire may increase the occurrence of fires with extreme fire behavior, including high flames lengths, rapid rates of spread and a high probability of escaping initial attack. The risk to resources within the project area, including investments made in the recovery of the area burned by the Soda Fire would not be reduced. No targeted grazing would occur to create an area of low and discontinuous fuel that inhibits extreme fire behavior.

3.2.2.2 General Effects of Action Alternatives

All action alternatives include the construction of fuel breaks designed to modify fire behavior and make fires easier to control and contain. Reducing fuels within fuel breaks has additional benefits for fire suppression resources during burnout and holding operations as follows:

- Reduced fire line intensity – as fire moves from fuel model SG2 (grass shrub) into GR1 (primary short grass), fire intensity is reduced (Appendix B). The fuel break on both sides of the road will increase area and time fire behavior is being reduced and fire intensity is lowered. This increases the margin of success for suppression crews.

- Increase the safety margin for suppression crews through lower fire line intensity. Including, the ability to move up and down the fire line to address surges and changes in fire behavior and move away from intense fire behavior then re-engage quickly when fire behavior dies down or moderates.

- Increase ability to patrol for spots across the line – it is easier to detect spot fires while small in a areas where fuels have been mowed/reduced and not hidden in tall sagebrush until well established.

- Increase ability to catch spot fires across line because the fire is spotting into an area of reduced fuel loading. Spot fires take longer to establish and build up intensity in reduced fuels.

- Spot fires and line breaches are easier to control with fewer resources. In other words, less equipment, water, fire retardant would be needed because fire spotting into an area of reduced fuels.

- Fire retardant is much more effective in fuel breaks than untreated fuels. Fire retardant is able to completely coat fuels rather than getting hung-up in the sagebrush canopy, which allows fire to creep through fine fuels from beneath the sagebrush.

- Changing the fuel model within the fuel break from a sagebrush model to a grass fuel model will reduce spotting distance. Grasses, owing to their fineness and short consumptive time, produce fewer embers that survive to return to the ground (USDA USFS 2011b). Wider fuel breaks provide larger areas of reduced fuels for fire brands to be generated from and larger areas of reduced fuels for spots to land in if carried over a bladed road as fire contacts fuel breaks.

- The residence time (the time the plant is flaming and BLM needs to stay to manage it) of flaming fuels is greatly reduced in the fuel breaks due to reduced fuels. The burnout time in GR1 (grass fuel model) is less than the burnout time in the SR2 (sagebrush model). This allows suppression resources to have much more mobility in regards to moving up and down a fire line (fuel break) holding and burning out line in fine fuels versus heavy sagebrush fuels. This allows the firefighters to hold and secure larger expanses of line with fewer resources.

The effectiveness of mechanical or seeded fuel breaks would be based on their width. Targeted grazing would create a zone of fuels that would not support high flame lengths or high rates of spread. Road maintenance would improve response time to fire incidents and improve the fuel breaks.

Implementation of prescribed fire would help to maintain fuel breaks by removing accumulated fuels along fencelines and topographical features (ditches or draws filling with weeds) within proposed fuel breaks.

Implementation of any action alternative is expected to aid firefighters, provide for their safety, and protect resources within the project area including investments into the recovery of the area burned by the Soda Fire.

3.2.2.3 Alternative 2 – Proposed Action

The Proposed Action would create a network of vegetated or mechanical fuel breaks up to 200 feet wide on either side of existing roads throughout the project area (25,517 acres; 3,896 acres of prostrate kochia and 21,621 acres of other fuel breaks). Road maintenance would occur on all roads with adjacent fuel breaks. The desired width of 200 feet may be modified based on adjacent topography or presence of critical resources (See Design Features Section 2.4.4). The 200-foot mowed or vegetated fuel breaks would provide both shortened flame lengths along roads and would reduce the time it takes fire to move from the fuel break edge to the road providing firefighters with fuel conditions amiable to direct attack and more time to contain the fire edge. The 200-foot fuel break will provide the largest margin of success for suppression crews in battling wildfire. Targeted grazing would occur in WUI areas along the northern portion of the project area on approximately 2,006 acres, overlapping some of the areas proposed for prostrate kochia fuel breaks (Figure 1-1). The Proposed Action would result in decreased wildfire intensity and rate of spread in the fuel break. A greater number of fires would be contained and controlled more quickly compared to Alternative 1. Firefighters would have pre-established fuel breaks on the landscape to create safe anchor points from which to construct fire lines, or to backburn. Maintenance done of the roads would contribute to lower response time and increase the chances of fires being caught by initial attack.

Fire sizes in the project area would likely be lower than the historical average, and the risk to resources including the investments made in the recovery of the area burned by the Soda Fire would be lower compared to Alternative 1.

Maintenance of the fuel break by mowing, hand cutting, and/or herbicides would keep fuel breaks effective into the future.

3.2.2.4 Alternative 3 – Modified Proposed Action

Under this alternative, fuel breaks would be decreased to 100 feet on either side of roads, and there would be no road maintenance except on existing roads that have undergone NEPA review for maintenance. The narrower fuel breaks would be less effective than those constructed under the Proposed Action alternative because fire would spread more quickly across the fuel break area and firefighters would have fewer opportunities to anchor control lines. This would not increase the margin of success for fire suppression crews to the degree than the Proposed Action would. Fuel breaks that are constructed along roads that are not maintained may be difficult to reach, and firefighter response time would be longer, increasing the chances that fire would cross the fuel break. Overall, this alternative is expected to provide some utility to firefighters and may help reduce fire size but it is not expected to reverse the trend of increasing fire size across the project area.

The effects of fuel break maintenance would be the same as described in the Proposed Action alternative.

3.2.3 Cumulative Effects – Wildfire Management

The scope of analysis for cumulative impacts includes the project area and adjacent grazing allotments for the effective life of the network of fuel breaks. This scope is appropriate as fuel breaks within the project may impact wildfires in nearby areas.

Past actions in the area have shaped the management of wildland fire. Present and foreseeable future impacts will continue to shape the way wildfire is managed.

Development of transmission lines would result in increased ignition sources from construction and maintenance and from the transmission lines themselves. These developments would also result in values (facilities) that would be a high priority for protection by firefighters. Recreational activity would have impacts that occur year after year. These may result in increased ignition sources, and values (facilities) with high priority for protection from firefighters. Both transmission line and recreational development may result in increased road or trail building, which would serve to fragment continuous fuels and act as ad hoc fuel breaks. Any human activity in the area has the potential to introduce non-native species. Some of these, notably annual grasses, create hazardous fuel conditions that can contribute to extreme and difficult to control fire behavior.

The activities outlined in the Soda Fire ESR Plan (USDI BLM 2015a) would impact wildfire management into the future. The network of fuel breaks would enhance firefighter safety, and modify fire behavior such that fires are easier to control and contain. This impact would carry on throughout the life of the fuel breaks.

3.3 General Vegetation including Noxious and Invasive Weeds

3.3.1 Affected Environment – General Vegetation including Noxious and Invasive Weeds

3.3.1.1 General Vegetation

The analysis area for general vegetation, including noxious and invasive weeds, consists of the Project area plus a 200-foot buffer. The analysis area encompasses 432,588 acres in Idaho and 215,658 acres in Oregon, 62 and 58 percent of which have been previously burned, respectively. For a description of the fire regime history within the Project Area, including burn severity and information on fires other than the Soda Fire, see Section 3.2, Wildfire Management section. Elevation within the analysis area ranges from 2,324 to 7,414 feet in Idaho, and 2,413 to 5,993 feet in Oregon.

Vegetation within the analysis area is dominated by shrubland (69 percent of analysis area), primarily big sagebrush (*Artemisia tridentata*) shrubland and steppe, as well as low sagebrush (*Artemisia arbuscula*) shrubland and steppe in Idaho, and grassland and steppe in Oregon. In Idaho, conifer and exotic herbaceous vegetation communities are also prevalent, constituting 11 percent (47,585 acres) and 10 percent (43,258 acres) of the analysis area in Idaho (432,588 acres), respectively. In Oregon, exotic herbaceous vegetation is also prevalent, constituting 24 percent (51,758 acres) of the analysis area in Oregon. Barren areas constituting less than 0.08 percent (174 acres) are present in Oregon. These barren areas include unique ash communities (ash and clay outcrops) which support plants endemic to Malheur County. The conifer community type in Idaho is dominated by juniper woodland and savanna, while the exotic herbaceous community type in both Idaho and Oregon is dominated by introduced annual grassland (USGS LANDFIRE 2013; Table 3.3-1).

Table 3.3-1. USGS LANDFIRE Vegetation Communities within the Analysis Area by State

State	Vegetation Community Type	Vegetation Community Sub-type	Acres
Idaho	Agricultural	Agricultural	4,800
	Barren	Barren	53
	Conifer	Douglas-fir Forest and Woodland	236
		Douglas-fir-Grand Fir-White Fir Forest and Woodland	501
		Douglas-fir-Ponderosa Pine-Lodgepole Pine Forest and Woodland	3,583
		Juniper Woodland and Savanna	34,527
		Lodgepole Pine Forest and Woodland	1
		Mountain Mahogany Woodland and Shrubland	3,481
		Pinyon-Juniper Woodland	1,636

State	Vegetation Community Type	Vegetation Community Sub-type	Acres
		Ponderosa Pine Forest, Woodland and Savanna	1,114
		Spruce-Fir Forest and Woodland	788
	Conifer-Hardwood	Aspen-Mixed Conifer Forest and Woodland	2,155
	Developed	Developed	4,474
	Exotic Herbaceous	Introduced Annual and Biennial Forbland	1,146
		Introduced Annual Grassland	39,835
		Introduced Perennial Grassland and Forbland	333
	Grassland	Alpine Dwarf-Shrubland, Fell-field and Meadow	1,976
		Grassland	3,133
	Hardwood	Aspen Forest, Woodland, and Parkland	18,669
	Open Water	Open Water	308
	Riparian	Spruce-Fir Forest and Woodland	6
		Western Herbaceous Wetland	372
		Western Riparian Woodland and Shrubland	8,464
	Shrubland	Big Sagebrush Shrubland and Steppe	161,609
		Deciduous Shrubland	655
		Desert Scrub	1,065
		Grassland and Steppe	36,239
		Greasewood Shrubland	1,948
		Low Sagebrush Shrubland and Steppe	80,188
		Salt Desert Scrub	17,780
	Sparsely Vegetated	Sparse Vegetation	1,515
Total Vegetation (Idaho)			**432,588**
Oregon	Agricultural	Agricultural	1,205
	Barren	Barren	174
	Conifer	Douglas-fir Forest and Woodland	27
		Douglas-fir-Ponderosa Pine-Lodgepole Pine Forest and Woodland	45
		Juniper Woodland and Savanna	3,528
		Mountain Mahogany Woodland and Shrubland	125
		Pinyon-Juniper Woodland	20
		Ponderosa Pine Forest, Woodland and Savanna	165
	Conifer-Hardwood	Aspen-Mixed Conifer Forest and Woodland	2
	Developed	Developed	3,191
	Exotic Herbaceous	Introduced Annual and Biennial Forbland	885
		Introduced Annual Grassland	49,035
		Introduced Perennial Grassland and Forbland	1,443
	Grassland	Alpine Dwarf-Shrubland, Fell-field and Meadow	381
		Grassland	284
	Hardwood	Aspen Forest, Woodland, and Parkland	641

State	Vegetation Community Type	Vegetation Community Sub-type	Acres
	Open Water	Open Water	72
	Riparian	Western Herbaceous Wetland	1,542
		Western Riparian Woodland and Shrubland	2,419
	Shrubland	Big Sagebrush Shrubland and Steppe	87,752
		Deciduous Shrubland	41
		Desert Scrub	504
		Grassland and Steppe	42,027
		Greasewood Shrubland	220
		Low Sagebrush Shrubland and Steppe	17,728
		Salt Desert Scrub	1,336
	Sparsely Vegetated	Sparse Vegetation	864
Total Vegetation (Oregon)			**215,658**
Total Vegetation (Analysis Area, Idaho and Oregon)			**648,247**

The vegetation communities within the analysis area described above were identified based on USGS LANDFIRE data, which includes vegetation, fire, fuel, and topography datasets that describe existing vegetation composition and structure based on georeferenced field plot data, satellite imagery, and simulation models (Zahn 2015). In addition to this digital dataset, field-based vegetation information is available for portions of the analysis area as a result of field data collected following the Soda Fire. Following containment of the Soda Fire in 2015, the Interdisciplinary Team conducted rapid field assessments between August 19 and August 23; local vegetation resource specialists identified vegetation resources within the Soda Fire perimeter, and added to existing, pre-burn information on vegetation resources in Idaho and Oregon. The Soda Fire area constitutes a large portion of the analysis area, and thus, the results of these assessments are described below.

In Idaho, vegetation within the Soda Fire perimeter is primarily sage-steppe plant communities. Ecological sites are primarily loamy Wyoming sagebrush (*Artemisia tridentata* var. *wyomingensis*)/bluebunch wheatgrass (*Pseudoroegneria spicata*) or shallow claypan low sagebrush/bluebunch wheatgrass or Idaho fescue sites (*Festuca idahoensis*). There are smaller amounts of loamy basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*), loamy mountain sagebrush (*Artemisia tridentata* ssp. *vaseyana*), and sandy loam Wyoming sagebrush ecological sites (Table 3.3-2). Ecological sites containing little sagebrush (*Artemisia arbuscula* ssp. *arbuscula*), Thurber's needlegrass *(Achnatherum thurberianum)* and Indian ricegrass (*Achnatherum hymenoides)* are also present.

Table 3.3-2. Soda Fire NRCS Ecological Sites in Idaho

Ecosite Group (Temperature/ Moisture Regime)	NRCS Ecological Site[1]	Acres	Percent of Fire
Big sagebrush/ Warm Dry	Loamy 10-13 Wyoming sagebrush/bluebunch wheatgrass	56,627	24%
	Sandy loam 8-12 Wyoming sagebrush/Indian ricegrass	13,781	6%
	Loamy 8-12 Wyoming sagebrush/bluebunch wheatgrass- Indian ricegrass	4,579	2%
	Loamy 11-13 basin big sagebrush/bluebunch wheatgrass	23,785	10%
	Loam 12-16 basin big sagebrush/bluebunch wheatgrass-Idaho fescue	4,374	2%
	Subtotal	**103,146**	**44%**
Low sagebrush/ Warm Dry	Shallow claypan 12-16 little sagebrush/Idaho fescue	51,139	22%
	Shallow claypan 11-13 little sagebrush/ bluebunch wheatgrass	41,941	18%
	Subtotal	93,080	40%
Big sagebrush/ Cool Moist	Loamy 13-16 and Loamy 16+ mountain sagebrush/Idaho fescue	13,872	6%
No ecological site identified		14,232	6%
Other[2]		8,619	4%
Total:		**232,949**	**100%**

[1] NRCS Ecological Site Descriptions available at: https://esis.sc.egov.usda.gov/Welcome/pgApprovedSelect.aspx

[2]Other Ecological Sites include Calcareous loam, Dry meadow, Loamy bottom 12-16, Mahogany savanna, Mountain ridge, and Very shallow stony loam 10-14; none of these make up more than 3% of the fire area.

In Idaho, pre-burn vegetation typically consisted of an overstory of sagebrush, with varying amounts of perennial bunchgrasses and invasive annuals (cheatgrass [*Bromus tectorum*], other annual bromes, medusahead [*Taeniatherum caput-medusae*], and ventenata [*Ventenata dubia*]). In general, the lower elevations have lower proportion of perennial bunchgrasses and higher proportion of cheatgrass. Cheatgrass is common throughout the Soda Fire perimeter, while medusahead, other annual bromes, and ventenata are most abundant in the south and southwest part of the fire. Few areas of pure annual grass monoculture were present within the fire area, besides medusahead patches on clay soil openings in the Rockville and Juniper Spring allotments, located north of Highway 95 in Idaho.

Upland vegetation in the Soda fire perimeter in Idaho included extensive Wyoming sagebrush and low sagebrush stands, and more limited areas of basin big sagebrush, mountain big sagebrush, mountain mahogany (*Cercocarpus* spp.), and salt desert shrub stands. As a result of the fire, shrub cover has been largely removed across the Soda Fire area. Perennial grass mortality also appears high (frequently 70-90 percent in areas visited).

In Oregon, the rangeland landscape of the southeastern Oregon cool steppe environment is a product of geological and ecological processes, as well as human impacts. Immediately prior to settlement in the late 19th century, two major vegetation types dominated the lower elevation desert upland communities (USDI BLM 2015a). One type was typified by big sagebrush and bluebunch wheatgrass in which dominance of sagebrush varied according to the incidence of fire and other factors. The presence of other species varied with elevation, soil, and rainfall. Sandberg bluegrass (*Poa secunda*) and bottlebrush squirreltail (*Elymus elymoides*) are found in drier areas, and low sagebrush occurred on shallow soil. Idaho fescue and antelope bitterbrush (*Purshia tridentata*) reached co-dominance with bluebunch wheatgrass and big sagebrush at upper elevations and provided the understory in juniper (*Juniperus* spp.) woodlands. Other minor species included Thurber's needlegrass, prairie junegrass (*Koeleria macrantha*), needle and thread grass (*Hesperostipa comata*), and several shrubs.

The second major lower elevation steppe vegetation type, is composed primarily of shrubs, grows on alkaline soil and is dominated by shadscale (Atriplex confertifolia) and other shrubs, including spiny hopsage (*Grayia spinosa*), winterfat (*Krascheninnikovia lanata*), bud sagebrush (*Picrothamnus desertorum*), and greasewood (*Sarcobatus vermiculatus*). Bluebunch wheatgrass occurred in the understory, while larger amounts of bottlebrush squirreltail and Indian ricegrass dominated on sandy soils.

The area burned in the Soda Fire in Oregon is dominated by sagebrush/native bunchgrass communities. Big sagebrush/bunchgrass communities are the most widespread type within the burned area, with basin big sagebrush growing on deep alluvial soils, and Wyoming big sagebrush growing on well-drained soils at middle to lower elevations. Low sagebrush/bunchgrass communities dominate on shallow soils that are stony or clayey. Perennial grassland communities do not form a major climax vegetation type though they do dominate for a period following fire when the shrub component is eliminated. Historically, sagebrush/native bunchgrass communities were maintained with periodic wildfire as often as every 50–100 years in sites that support Wyoming big sagebrush, to even less frequent in low sagebrush communities with limited fine fuels. As a result of the elimination of fine fuels capable of supporting fire spread, many sites currently support a community with a much greater woody species (i.e., shrubs and trees) composition than was present prior to European settlement.

A number of vegetation communities are the products of past heavy grazing use, fire, or rehabilitation efforts. Shrub/annual grassland communities are the product of past disturbance where cheatgrass, medusahead and other annuals have either replaced or co-exist with the perennial bunchgrass component of a sagebrush/bunchgrass community. Increased fire frequency, supported by heavy loading of fine fuels, has resulted in areas dominated by annual grasslands with little or no shrub component. Where present in the pre-burn vegetation community, rabbitbrush (*Chrysothamnus* spp. and *Ericameria* spp.) has replaced other shrub species in the overstory of sagebrush/bunchgrass communities for a period following fire. Seedings of crested wheatgrass (*Agropyron cristatum*) and other introduced perennial species, with varying amounts of sagebrush and other shrub overstory, have been completed to rehabilitate and stabilize some low-seral sagebrush/bunchgrass communities in the Soda Fire perimeter in Oregon (Table 3.3-3).

Table 3.3-3. Soda Fire Vegetation Communities in Oregon

Vegetation Type	Associated Species	Approximate Acres	Percent of Fire
Big sagebrush/perennial grassland	Wyoming big sagebrush, basin big sagebrush, mountain big sagebrush, antelope bitterbrush, bluebunch wheatgrass, Idaho fescue, Thurber needlegrass, Sandberg bluegrass, basin wildrye (*Leymus cinereus*), bottlebrush squirreltail, arrowleaf balsamroot (*Balsamorhiza sagittata*), phlox (*Phlox* spp.)	30,000	57%
Low sagebrush/grassland	Low sagebrush, bluebunch wheatgrass, Thurber needlegrass, Idaho fescue, cheatgrass, biscuitroot (*Lomatium* spp.), Sandberg bluegrass	5,000	10%
Big sagebrush/annual grassland	Big sagebrush, cheatgrass, tumble mustard (*Sisymbrium altissimum*), clasping pepperweed (*Lepidium perfoliatum*), foxtail barley (*Hordeum jubatum*), Sandberg bluegrass	5,000	10%
Annual grassland	Cheatgrass, foxtail barley, sixweeks fescue (*Vulpia octoflora*), Sandberg bluegrass, tumble mustard, clasping pepperweed	9,000	17%
Salt desert shrub/grassland	Shadscale, saltbush (*Atriplex* spp.), bud sagebrush, fourwing saltbush (*Atriplex canescens*), spiny hopsage, horsebrush (*Tetradymia* spp.), winterfat, bottlebrush squirreltail, saltgrass, basin wildrye	500	1%
Crested wheatgrass	Crested wheatgrass	2,800	5%

The portion of the Soda Fire that burned through Oregon generally burned at a low intensity. This was confirmed by photography and on-site visits where many islands of unburned vegetation were observed as well as partially burned sagebrush. Examination of the perennial grass showed little damage to the crowns and high likelihood of survival. Observations also showed that both medusahead and cheatgrass where common in the area, especially in the southern area that burned west of Highway 95, along roads and other high livestock use areas such as near reservoirs.

The elevation of the area burned in the Soda Fire in Oregon ranges from over 5,000 feet on Pole Top Table to less than 2,600 feet in the extreme northern reaches of the burn. Nearly 75 percent of the area lies above 4,000 feet and is expected to recover quickly especially if the medusahead is treated, as indicated in the Soda Fire ESR Plan (USDI BLM 2015a).

Various ESR treatments have been planned and implemented within the Soda Fire perimeter, as indicated in the Soda Fire ESR Plan (USDI BLM 2015a) and in Chapters 1 and 2 of this EA. These treatments include seeding and seedling planting of perennial grasses, forbs, and shrubs, and are described further in the Soda Fire ESR Plan.

3.3.1.2 Noxious and Invasive Weeds

A noxious weed is defined as any plant designated by Federal, State, or county government as injurious to public health, agriculture, recreation, wildlife, or property (Sheley et al. 1999). A noxious weed is also commonly defined as a plant that grows out of place and is competitive, persistent, and pernicious (James et al. 1991). In Idaho, noxious is a legal designation given by the Director of the Idaho State Department of Agriculture (ISDA) to any plant having the potential to cause injury to public health, crops, livestock, land or other property (Idaho Statute 22-2402). The ISDA is responsible for administering the State Noxious Weed Law in Idaho and maintains a list of noxious weeds. In Oregon, the Oregon Department of Agriculture (ODA) Noxious Weed Control Program and the Oregon State Weed Board (OSWB) maintain the State Noxious Weed List. Within the analysis area, 13,767 infestations of 21 Oregon and/or Idaho-designated noxious weed species have been documented (USDI BLM 2012; Table 3.3-4).

Table 3.3-4. Idaho- and Oregon-listed Noxious Weeds Documented within the Analysis Area

Common Name	Scientific Name (Synonym Name)	State(s) with Noxious Weed Status[1]	Distribution[2]	Identified Priority Level for Treatment[3]
Bull thistle	*Cirsium vulgare*	Oregon	Generally limited occurrences in riparian areas, spring developments, and ponds.	This is a medium priority species for chemical treatment.
Kochia (burning bush)	*Bassia scoparia (Kochia scoparia)*	Oregon	Common along Hwy 95 in Oregon.	Not identified for treatment.
Canada thistle	*Cirsium arvense*	Idaho, Oregon	Occurs throughout Soda Fire perimeter in Idaho, primarily confined to riparian areas, spring developments and ponds. Common along Hwy 95 in Oregon.	Due to establishment throughout Soda Fire perimeter in majority of riparian areas this species is low priority for chemical treatment.
diffuse knapweed	*Centaurea diffusa*	Idaho, Oregon	Limited occurrence within Soda Fire perimeter in Idaho. In Oregon, scattered along Hwy 95 north of Cow Creek.	High priority for treatment.
field bindweed	*Convolvulus arvensis*	Idaho, Oregon	Common along Hwy 95 in Oregon.	Not identified for treatment.
jointed goatgrass	*Aegilpos cylindrica*	Idaho, Oregon	Limited known occurrence within Soda Fire perimeter in Idaho and Oregon.	This species has potential to expand and is high priority for treatment especially roadsides.

Common Name	Scientific Name (Synonym Name)	State(s) with Noxious Weed Status[1]	Distribution[2]	Identified Priority Level for Treatment[3]
leafy spurge	*Euphorbia esula*	Idaho, Oregon	Several small infestations (0.1 - 0.5 acres) in Oregon and Idaho.	This is a high priority species due to the high potential for expansion and establishment.
medusahead	*Taeniatherum caput-medusae*	Oregon	Dense at lower elevations within analysis area, gradually decreasing at higher elevations.	Identified for chemical treatment; likely to spread following Soda Fire.
nodding plumeless thistle	*Carduus acanthoides*	Idaho, Oregon	Single occurrence along creek and roadside.	Not identified for treatment.
perennial pepperweed	*Lepidium latifolium*	Idaho, Oregon	Several infestations of low to moderate density in riparian areas of creeks, as well as ponds, springs, and roadsides.	This is a medium-high priority species.
poison hemlock	*Conium maculatum*	Idaho, Oregon	Limited, found in riparian areas.	This is a medium priority species due to the fact there are not many known occurrences of this species within or adjacent to the fire.
puncturevine	*Tribulus terrestris*	Idaho, Oregon	Located along several roads within analysis area.	This is a medium priority species and is primarily a roadside threat.
purple loosestrife	*Lythrum salicaria*	Idaho, Oregon	This is a very limited species with the potential to inhabit riparian areas.	Of low concern due to the effectiveness of biological control (beetle).
rush skeletonweed	*Chondrilla juncea*	Idaho, Oregon	Known to occur in several areas, including along roadsides and creeks	This is a high priority species due to the increasing number of infestations and potential for establishment throughout the Soda Fire perimeter.
Russian knapweed	*Acroptilon repens*	Idaho, Oregon	The majority of known occurrences are less than 0.1 acre in size and located near travel routes.	This is a high priority species that is relatively limited within the fire perimeter but seems to be on the increase in the region.
saltlover/ halogeton	*Halogeton glomeratus*	Oregon	Scattered along roads in Oregon.	Not identified for treatment; has the potential to spread back into the Soda Fire boundary in Oregon by vehicle traffic
Scotch thistle	*Onopordum acanthium*	Idaho, Oregon	Scotch thistle is very common throughout and around the Soda Fire perimeter in Idaho, usually occurring at reservoirs, spring developments and riparian areas. In Oregon, scattered along roadsides.	Medium to high priority.

Common Name	Scientific Name (Synonym Name)	State(s) with Noxious Weed Status[1]	Distribution[2]	Identified Priority Level for Treatment[3]
spotted knapweed	*Centaurea stoebe*	Idaho, Oregon	There are no known spotted knapweed infestations within the Soda Fire perimeter in Idaho but it does occur in several locations around the Soda Fire perimeter. In Oregon, occurs in Succor Creek State Park and along Hwy 95.	High priority species
tamarisk/ saltcedar	*Tamarix* ramosissima	Idaho, Oregon	This species occurs throughout and around the fire perimeter in Idaho and Oregon, primarily in riparian areas, springs, ponds and creeks.	A biocontrol agent (beetle) has recently become established in western Oregon and on the Snake River in Idaho. It is expected this insect will continue to spread throughout the region and attack remaining tamarisk plants.
whitetop (hoary cress)	*Cardaria draba (Lepidium draba)*	Idaho, Oregon	Common throughout the analysis area, along roads and creeks.	Medium to high priority.
yellow star-thistle	*Centaurea solstitialis*	Idaho, Oregon	Scattered along roads and creeks in Idaho and Oregon.	High priority species.

[1] State listed noxious weed (ISDA 2016, ODA 2016)
[2] USDI BLM 2015a and USDI BLM 2012
[3] USDI BLM 2015a

Noxious weeds are now recognized worldwide as posing threats to biological diversity—second only to direct habitat loss and fragmentation. Noxious weeds are known to alter ecosystem functions such as nutrient cycles, hydrology, and wildfire frequency; to outcompete and exclude native plants and animals; and to hybridize with native species. The presence and abundance of noxious weeds in an ecosystem is highly dynamic, subject to changes in the local environment (Whitson et al. 1992). All natural communities are susceptible to invasion by noxious weeds. Plant species identified as "weedy" are uniquely adapted to increase in numbers and spread into previously uninfested areas following disturbances, and have the potential to alter soil stability and plant community diversity. These 21 noxious species are at risk of encounter and/or spread as a result of implementation of the no action and action alternatives. These species vary in density and distribution in the analysis area, as identified in Table 3.3-3.

Noxious weeds spread by dispersal of seeds or plant parts in a variety of ways; wind, water, animals, machinery, and people transport seed and plant parts from one location to another. They produce abundant seeds, and many have attaching devices (e.g. hooks, barbs, sticky resins) that facilitate their transport and dispersal. Highways, roads, trails, and river corridors serve as routes of initial establishment and weeds may advance from these corridors into new areas. Noxious weeds are capable of invading and dominating disturbed areas (roadsides, areas burned by wildfire, etc.) over a wide range of precipitation regimes and habitats (Sheley and Petroff 1999).

3.3.2 Environmental Consequences – General Vegetation including Noxious and Invasive Weeds

3.3.2.1 Alternative 1 – No Action

Without a strategic network of fuel breaks to facilitate containment and reduce the amount of acres burned annually, large and/or frequent wildfires are expected to occur across the analysis area, based on wildfire trends over the last 30 years. Leaving sagebrush steppe vegetation communities untreated would have major consequences including a probable vegetation type conversion to annual-dominated systems, shortened fire return interval, eventual loss of native plant diversity and degraded watershed function. Other identified forested and shrub vegetation communities would likely also experience reduced community health as a result of overstory loss from fire. A conversion to exotic annual grasses would increase the fire frequency and the potential for future large fires to occur. This higher frequency increases the risk to vegetation rehabilitation investments, and remaining vegetation adjacent to the burn.

3.3.2.2 General Effects of Action Alternatives

Currently, approximately 62 percent of the Proposed Action footprint in both Idaho and Oregon is mapped as shrubland, while 10 percent of the analysis area in Idaho and 24 percent of the analysis area in Oregon is mapped as exotic herbaceous, respectively. The removal of established perennial plants from the treatment footprint and reciprocal replacement with seeded fuel break species would be a trade-off for the increased capability to reduce fire size within and adjacent to the analysis area; thereby protecting existing native plant communities as well as past and future fire rehabilitation and restoration investments. However, 278,947 acres within the analysis were burned during the Soda Fire and are currently in early seral stage.

By design, existing vegetation within the footprint of the fuel breaks would be eliminated (except for perennial species in natural/natural recovery fuel breaks that meet fuel break criteria) to develop the proposed treatments by disking, targeted grazing, and/or seeding new species. Seeded species would replace existing native and non-native species to ensure fuel breaks consist of low statured, competitive, fire resilient perennial species. Most existing bunchgrasses and forbs would not be expected to survive treatments involving high levels of soil disturbance or yearly maintenance (e.g., disking and targeted grazing). Herbicide treatments to control competition would target invasive annual grasses and forbs; however, perennial grasses and forbs may also become unintended targets. Repeated maintenance mowing over time may result in mortality of existing sagebrush plants within the footprint of the fuel break, requiring seeding of plants that fit the fuel break vegetation criteria.

General effects of each fuel break method are described below.

Mowing

Mowing would remove shrub branches and foliage higher than 6-12 inches within the treatment footprint. Removal of the shrub canopy often results in a short-term increase in young plants following treatment. Mowing would be repeated as shrub canopies regrow and exceed the 12 inch height. Repeated mowing of woody species would result in a decrease in vigor over the long term (10+ years) and these plants may eventually die off.

Opening the shrub canopy through mowing can result in a release of herbaceous plants in the short-term (1-3 years), especially annual species (Davies et al. 2011). Subsequent herbicide applications would likely be required to control noxious and invasive weeds. An indirect effect of mowing vegetation to create fuel breaks would include the potential for annual species, including noxious and invasive weeds, to spread from the fuel break into adjacent vegetation communities. Another indirect effect would include reduced potential for larger and/or more frequent wildland fire and increased capability to protect existing native plant communities and current and future wildland fire vegetation rehabilitation and restoration investments.

Prescribed Fire

Prescribed fire would be used where necessary to burn accumulations of weeds on fence lines or in topographical features such as draws or ditches associated with the proposed fuel breaks. Decomposition is extremely slow within the analysis area due to the arid environment, resulting in an accumulation of biomass and fuels over time, especially along fencelines and in topographical features where invasive species such as tumbleweed (i.e., Russian thistle, *Salsola kali*) are deposited during wind dispersal. As a result, fuel loading becomes predominantly composed of fine, flashy fuels; fire intensity during prescribed burns would be low, and of short duration, and unlikely to consume all seeds in the soil seed bank. Often only the seeds in the uppermost layer of the soil surface are destroyed by prescribed fire (Diamond et al. 2012).

Direct effects of prescribed fire would include the removal of accumulated biomass created by deposits of wind-dispersed invasive species such as Russian thistle, as well as the biomass of any perennial or annual plants on-site. An indirect effect of this treatment would be the reduced potential for larger and/or more frequent wildland fire, and increased capability to protect existing native plant communities and past and future vegetation rehabilitation and restoration investments. Burning would be done in spring when surrounding green vegetation would retard fire spread from, or in the fall when surrounding live fuel moistures are high enough to retard fire spread outside of targeted prescribed fire areas; as a result, prescribed fires are not expected to spread from targeted areas.

Hand Cutting

The direct effect of hand cutting using chainsaws or loppers to create fuel breaks would be the reduction in density and canopy cover of shrubs (or trees) within the treatment footprint. As with mowing, effects would include a release of herbaceous plants in the short-term, potential spread of these plants into adjacent vegetation communities, and a reduced potential for larger and/or more frequent wildland fires.

Chemical Treatment

Herbicides could be used to prepare the seedbed for a seeding, to maintain a fuel break by reducing the amount of fuel available for wildfire, and to reduce the prevalence of annual grasses in stands of perennial grass. During seedbed preparation, any vegetation within the fuel break footprint would be targeted. As a maintenance treatment and annual grass reduction, target vegetation would include invasive annual grasses and forbs, noxious weeds, and any native vegetation that doesn't meet the fuel break criteria.

The direct effect of chemical treatment to create and maintain fuel breaks is the control of undesirable annual grasses and forbs, and the subsequent increase in density and vigor of existing seeded species due to lowered competition levels. The herbicide treatments to kill target vegetation and the extent of disturbance to non-target vegetation would vary by the type of chemical pathway employed (foliar vs soil), the timing of application (growing season vs. dormant season), as well as plant community composition and soil types in the area (Cox and Anderson 2004, Sheley et al. 2005, Nyamai et al. 2011). Individual herbicide effects to vegetation are described in the *Vegetation Treatments using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* (USDI BLM 2007a), the 2016 Final PEIS for *Vegetation Treatments Using Aminopyralid, Fluroxypyr, and Rimsulfuron on BLM Lands in 17 Western States* (USDI BLM 2016), and *Vegetation Treatments Using Herbicides on BLM Lands in Oregon* Record of Decision (2010).

Harming or killing off-site or non-target vegetation could occur over the long-term with repeated chemical treatments to control noxious and invasive weeds in the fuel breaks. The risk would be minimized through strict adherence to label direction and adherence to the design features of the action alternatives developed for resource protection (Section 2.4.4). An indirect effect of herbicide treatment over time include reduced potential for larger and/or more frequent wildland fire and increased capability to protect existing native plant communities and past and future wildland fire vegetation rehabilitation and restoration investments.

Vegetated Fuel Break

General

Mechanical seedbed preparation such as disking or chemical treatments may be used to reduce competition prior to planting. Potential impacts from disking are described below, while chemical treatment impacts are described above. Depending on the type of equipment used to establish fuel break vegetation, soil disturbance would create conditions conducive to weed establishment and spread, particularly in the first two years or until seeded species become established. Design features of the proposed action such as equipment cleaning and pre- and post-implementation herbicide treatments of noxious weed infestations and invasive annual grass and forb control would reduce this potential.

Disking

The direct effect of disking to create a fuel break would be the removal of existing vegetation from the 200- or 400-foot wide treatment footprint. Design features for fuel break maintenance in the action alternatives would reduce the potential for invasive annual grasses and forbs and noxious weeds to establish. Indirect effects of disking to create fuel breaks given appropriate levels of maintenance could include reduced potential for larger and/or more frequent wildland fire and increased capability to protect existing native plant communities and past and future wildland fire vegetation rehabilitation and restoration investments. Compensatory with the amount of area disked, repeated use of herbicides for maintenance treatments could result in "super" weeds, or species that develop resistance to herbicides.

As a seedbed preparation technique, the direct effects of disking would be the removal of most, existing vegetation from the treatment footprint. This disturbance would increase the need for herbicide treatments to counter the temporary (increase in invasive annual grasses and forbs and/or noxious weeds. Removed vegetation, invasive annual grasses and forbs, and/or noxious weeds would be replaced by seeded species that meet the fuel break design criteria. An indirect effect of disking used for seedbed preparation, could include a reduced potential for larger and/or more frequent wildland fire and increased capability to protect extant native plant communities and current and future vegetation rehabilitation and restoration investments.

Seeding

Seeding perennial plant species for fuel breaks would change plant community composition and structure within the treatment footprint by replacing annual grasses and forbs, and/or native perennial grasses, forbs, and shrubs with perennial species that meet fuel break criteria. Species selected for this project have shown to be effective, or have potential to be effective at competing with invasive annual species. Design features to identify and treat introduced plants that spread beyond the treatment footprint are included in Section 2.4.4.

Prostrate Kochia

Established seedings of prostrate kochia have effectively occupied available niches within other fuel breaks under similar conditions thereby out-competing invasive annual grasses and forbs. These monotypic stands of prostrate kochia reduce species diversity and composition in the treatment footprint. An indirect effect of seeding the proposed plant species to create fuel breaks includes the potential of these species to spread outside of the treatment footprint (Grey and Muir 2013, McArthur et al. 1990).

There is some potential for prostrate kochia to spread into existing sagebrush and/or perennial bunchgrass stands with open and available niches. Reported recruitment or spread of prostrate kochia has been most strongly correlated with the level of soil disturbance in the surrounding area, lack of competition from other vegetation, and open spaces surrounding established prostrate kochia plants; spread was also correlated with prevailing winds but this was determined to be of less significance (Harrison et al. 2000) likely because the seed for this plant has no mechanism for wind dispersal. Prostrate kochia seed transport via vehicle traffic along fuel breaks would be unlikely, as fuel break seedings will not extend to the edge of a road or rail line due to right-of-way considerations. Prostrate kochia seed does not persist in the digestive tract of ruminants, and therefore would not be spread by most grazing animals (Schauer et al. 2004). Prostrate kochia seed loses viability quickly, even under ideal processing and storage conditions (Tilley et al. 2012); therefore a soil seed bank does not persist.

Multiple studies have found that prostrate kochia will spread into disturbed sites with abundant bare soil and few native perennials, but spreads very little into established shrub and perennial stands (McArthur et al. 1990, Clements et al. 1997, Harrison et al. 2000, Harrison et al. 2002, Sullivan et al. 2013). Monaco et al. (2003) found that ten years after seeding prostrate kochia, it had not moved into the adjacent cheatgrass stand. Similarly, 10 years after a greenstrip planting in Skull Valley, Utah and 12 years after a greenstrip planting near Mountain Home, Idaho, prostrate kochia had spread very little into adjacent dense cheatgrass stands as reported in Harrison et al. (2002). Gray and Muir (2013) found that soil cover was a "predictor of prostrate kochia spread," and suggested that this finding "may reflect that bare soil is necessary for its establishment." It was also suggested that disturbance may influence the abundance of prostrate kochia, reporting that the abundance of prostrate kochia was positively correlated with the number of fires since the prostrate kochia seeding occurred (Gray and Muir 2013), this finding is likely due to the capability of prostrate kochia to resprout following fire.

Blauer et al. (1993) and Clements et al. (1997) both reported that native plants can become established in prostrate kochia seedings, especially if fires are infrequent. Gray and Muir (2013) found prostrate kochia to be negatively correlated with most other species but suggests that, "disturbance associated with fire history and seeding activities may have depleted (native) species populations in the seeded areas, and likely affected species composition in these areas." It was further suggested that, "though these general patterns of species occurrence that we documented may be caused by interspecific interactions (between prostrate kochia and other species), they could also result from disturbance prior to and during seeding and proximity, or lack thereof, to native seed sources" (Gray and Muir 2013).

Although Gray and Muir (2013) documented prostrate kochia spread up to 2,328 feet from areas where it was drill seeded, six of the sites included in the study (including sites with spread distances of 2,328 feet 1,587 feet 1,578 feet, and 1,548 feet had been aerially seeded with prostrate kochia prior to and/or subsequent to drill seeding. These aerial seedings were implemented in the 1980s and 1990s, and although seeding boundaries were delineated with flagging, boundary lines are often blurred when land adjacent to the seeding was BLM with no private or state land nearby. This, combined with the potential for seed drift, resulted in a high likelihood of seeds being introduced outside the identified seeding area. Harrison et al. (2000), described boundaries of aerial seedings as not well defined due to wind gusts and seed drift.

Prostrate kochia had also been drill seeded in a green strip 1,050 feet from the end of a transect where prostrate kochia was thought to have spread 2,328 feet. This drill-seeded greenstrip had been reported in DeBolt (2002) and Tuason (2005). The 2,328 foot transect runs directly into a playa; additional data show that prostrate kochia had been aerially seeded on the west side of the playa, 590 feet from the end of the 2,328 foot transect. For five of the sites included in Gray and Muir (2013), the drill seeding boundaries were misidentified and the transects either started or ended inside a drill seeding. Prostrate kochia was drill seeded in 1986 within 1,312 feet of the site where Gray and Muir measured spread of 2,201 feet. Based on these data summarized from BLM files, USGS Land Treatment Digital Library, Gray and Muir (2013), Gray (2011), and Erin Gray's site notes, Gray and Muir's findings do not accurately represent the distance that prostrate kochia can spread from seeded sites.

Several studies reported prostrate kochia spread into both intact and disturbed sites considerably less than Gray and Muir (2013) reported (McArthur et al. 1990, Clements et al. 1997, Harrison et al. 2000, Waldron et al. 2001, Monaco et al. 2003, Tilley et al. 2014). Waldron et al. (2001) collected spread data from 81 prostrate kochia seedings and found a maximum spread of 1,263 feet with a recruitment margin ranging from 0 to 98 feet with an average recruitment margin of 20 feet. Across 28 sites, Gray and Muir (2013) reported a maximum spread of 2,328 feet, a recruitment margin ranging from 0-646 feet, with an average recruitment margin of 98 feet.

Gray and Muir (2013) suggest that the difference between their study and others could be due in part to the "accuracy of determining seeding boundaries…" However as mentioned above, Gray and Muir (2013) did not have accurate or complete data on all seeding sites used in their study. Gray described in site notes uncertainty about seeding boundaries for 15 of the 28 study sites. Gray (2011) indicated that if GIS shape-files were not available for delineation of seeding boundaries, then "sampling locations were targeted by determining the seeding boundary visually based upon drill rows or…barriers such as roads or fences." Waldron et al. (2001) did not report data from sites when the "original seeding boundaries were unknown."

Targeted Grazing

Utilizing grazing animals to create and maintain fuel breaks would disturb and/or remove both target and non-target vegetation from the treatment footprint. The extent of effects to non-target vegetation is dependent on the animal species used, management parameters (e.g., timing, area, intensity, frequency, and duration), plant species tolerance to grazing, and site pre-treatment condition (Hendrickson and Olson 2006). Cattle prefer grasses, but will eat most vegetation if confined for an extended period of time, and/or with high animal numbers (Burritt and Frost 2006).

Utilizing annual spring grazing, prior to cheatgrass and medusahead seed dispersal could reduce the density and cover of these species over time (Finnerty and Klingman 1962). However, the perennial grasses Sandberg bluegrass and bottlebrush squirreltail (with similar phenology to cheatgrass) could also be impacted (Murray 1971). Treatments that weaken or eliminate components of a plant community open niches that noxious weeds and invasive plants exploit. As with many other treatments, targeted grazing with livestock can be most effective when used in combination with other treatments (USDI 2010a). . Targeted grazing could be used as a seed bed preparation tool, to remove the accumulation of annual biomass or to eliminate existing vegetation prior to seeding.

Indirect and long-term effects of properly managed targeted grazing and appropriate levels of fuel break maintenance are expected to include reduced potential for larger wildland fire and increased capability to protect existing native plant communities and past and future wildland fire vegetation rehabilitation and restoration investments. There would be disturbance to vegetation in the short-term from temporary fencing, water hauls and supplemental sites, until treatment is complete. The impacts will increase if the area is grazed multiple times a year. Management of grazing activities would minimize disturbance.

3.3.2.3 Alternative 2 – Proposed Action

A total of 25,517 acres of existing vegetation would be converted into fuel breaks, 3,896 acres of prostrate kochia and 21,621 acres of other fuel breaks, in the 400-foot wide treatment footprint. Other fuel breaks include natural fuel breaks as well as seeded fuel breaks where species other than prostrate kochia would be seeded, as described in section 2.4. Targeted grazing would be conducted on 1,660 acres in Idaho and 346 acres in Oregon, overlapping some of the areas proposed for kochia fuel breaks (Figure 1-1).

Within the Proposed Action footprint, 7,475 acres in Idaho and 2,104 acres in Oregon were burned in the Soda Fire and are currently in early seral stage, including 5,036 acres of shrubland in Idaho and 1,029 acres of shrubland in Oregon. Approximately 2,558 acres of prostrate kochia fuel breaks and 14,651 acres of other fuel breaks would be developed in Idaho. In Oregon, 1,338 acres of prostrate kochia fuel breaks and 6,970 acres of other fuel breaks would be developed. Based on USGS LANDFIRE data, the majority of the fuel breaks would occur in shrubland vegetation in both Idaho and Oregon, followed by exotic herbaceous and developed vegetation types, which includes roads (Table 3.3-5). Similar to fuel breaks, targeted grazing would primarily occur in shrubland vegetation in both Idaho in Oregon, followed by non-native herbaceous and developed vegetation types (Table 3.3-5). Overall, the current downward trend in sagebrush cover in the project area is expected to reverse as a result of the improved compartmentalization provided by this extensive fuel break network.

Table 3.3-5. Acres of Fuel Breaks and Targeted Grazing in Idaho and Oregon as a Result of the Proposed Action

USGS LANDFIRE Vegetation Community Type	Fuel Breaks				Targeted Grazing	
	Idaho		Oregon			
	Kochia	Other	Kochia	Other	Idaho	Oregon
Agricultural	44	210	0	10	22	0
Barren	0	4	0	0	0	0
Conifer	0	1,246	0	22	0	0
Conifer-Hardwood	0	67	0	0	0	0
Developed	386	1,100	205	970	196	1
Exotic Herbaceous	208	1,383	157	1,678	243	11
Grassland	1	241	16	6	1	9
Hardwood	0	825	0	2	0	0
Open Water	0	3	0	0	0	0
Riparian	35	694	3	87	0	0
Shrubland	1,877	8,834	952	4,188	1,152	323
Sparsely Vegetated	8	44	4	8	4	2
TOTAL	**2,558**	**14,651**	**1,338**	**6,970**	**1,660**	**346**

3.3.2.4 Alternative 3 – Modified Proposed Action

A total of 11,771 acres would be converted into fuel breaks in the 200-foot wide treatment footprint, which is approximately 13,747 fewer acres of fuel break than under the Proposed Action. However, within the Modified Proposed Action footprint, 3,622 acres in Idaho and 920 acres in Oregon were burned in the Soda Fire and are currently in early seral stage, including 2,411 acres of shrubland in Idaho and 444 acres of shrubland in Oregon.

Approximately 1,596 acres of prostrate kochia fuel breaks and 6,485 acres of other fuel breaks would be developed in Idaho, which is 962 fewer acres of prostrate kochia fuel breaks and 8,166 fewer acres of other fuel breaks than the Proposed Action. In Oregon, 721 acres of kochia fuel breaks and 2,969 acres of other fuel breaks would be developed, which is 617 fewer acres of prostrate kochia fuel breaks and 4,001 fewer acres of other fuel breaks than the Proposed Action. As with the Proposed Action, the majority of the fuel breaks would occur in shrubland vegetation in both Idaho in Oregon, followed by exotic herbaceous and developed vegetation types (Table 3.3-6).

Table 3.3-6. Acres of Fuel Breaks and Targeted Grazing in Idaho and Oregon as a Result of the Modified Proposed Action

USGS LANDFIRE Vegetation Community Type	Fuel Breaks				Targeted Grazing	
	Idaho		Oregon			
	Kochia	Other	Kochia	Other	Idaho	Oregon
Agricultural	22	68	0	2	18	0
Barren	0	3	0	0	0	0
Conifer	0	458	0	6	0	0
Conifer-Hardwood	0	27	0	0	0	0
Developed	251	608	130	517	167	1
Exotic Herbaceous	146	664	66	714	207	9
Grassland	1	116	11	2	1	8
Hardwood	0	323	0	1	0	0
Open Water	0	1	0	0	0	0
Riparian	26	313	1	28	0	0
Shrubland	1,147	3,885	511	1,695	977	274
Sparsely Vegetated	4	20	3	4	3	2
TOTAL	**1,596**	**6,485**	**721**	**2,969**	**1,407**	**294**

Under the Modified Proposed Action, targeted grazing would be conducted on 1,407 acres in Idaho and 294 acres in Oregon, including in some of the same areas proposed for fuel breaks. This is 253 fewer acres in Idaho and 52 fewer acres in Oregon than the Proposed Action. Similar to fuel breaks, targeted grazing would primarily occur in shrubland vegetation in both Idaho in Oregon, followed by exotic herbaceous and developed vegetation types (Table 3.3-6).

Direct and indirect effects to the vegetation resource by treatment method would be the same as those described in Section 3.3.2.2 (General Effects of Action Alternatives), but across 13,746 (54 percent) fewer acres for fuel breaks, and 305 (15 percent) fewer acres for targeted grazing than Alternative 2. Fewer acres treated would result in less vegetation converted to fuel breaks and larger polygons defined by fuel breaks. These larger polygons could be at a greater risk for wildland fire than the polygons protected under Alternative 2. It is expected that the overall project area would experience a diminished trend of loss of sagebrush cover and plant diversity but that the overall trend would continue a downward trajectory.

3.3.3 Cumulative Effects – General Vegetation including Noxious and Invasive Weeds

The cumulative effects analysis area for general vegetation, including noxious and invasive weeds, is the same as the vegetation analysis area, which includes the proposed Project area and a 200-foot buffer and effects are expected to occur over the life of the project. Current condition of vegetation in the analysis area is described in the Affected Environment (Section 3.3.1). Actions that could cumulatively affect vegetation are construction and maintenance of the Gateway West Transmission Line project and Boardman to Hemingway Transmission Line project; vegetation treatments including post-fire treatments associated with the emergency stabilization and burned area rehabilitation plan (USDI BLM 2015a), and noxious weed management; ongoing livestock grazing; recreation; wildfire; and climate change.

Effects to vegetation from the Gateway West Transmission Line project and Boardman to Hemingway Transmission Line project could include vegetation modification or removal and an increase in noxious and invasive weeds. However, conservation measures associated with these projects are likely to result in a net benefit to native vegetation communities, especially those associated with the greater sage-grouse (*Centrocercus urophasianus*). Older electrical distribution lines are a known source of wildfire. Past, present, and future maintenance of utility lines results in some small-scale vegetation disturbance or removal along access routes and around poles. Current and future maintenance activities are subject to restrictions to reduce the potential for unintended fire starts.

Past and ongoing noxious weed treatments have, to some extent, reduced potential establishment and spread. However, noxious weeds continue to establish where not aggressively treated, particularly in the wake of large, frequent wildfires. Past, current, and future shrub restoration and noxious weed control treatments will be marginally successful without a reduction in fire size.

Ongoing livestock grazing may also contribute to cumulative effects. Grazing can reduce vegetation height and biomass and could alter fuel loading within and adjacent to treatment areas, potentially reducing the rate of spread for fire or fire severity. However, grazing in the analysis area is mostly light to moderate and thus not expected to contribute much to reducing fire at the current permitted level.

The effects of climate change on the analysis area are likely to be substantial; as the region becomes dryer and hotter, restoration of vegetated fuel breaks could become harder to establish and fires will likely become more prevalent. However, the proposed treatments should make the analysis area more resilient to fire, potentially mitigating the effects of climate change on vegetation in the analysis area.

Under the No Action Alternative, the effects of past, present, and foreseeable actions in the analysis area are expected to continue current trends for vegetation. This means that vegetation would continue to be converted to herbaceous plant communities and that fire would likely remove existing as well as recovering shrub stands. When added to either of the action alternatives (i.e., the Proposed Action or Modified Proposed Action), vegetation communities within the analysis area are expected to gradually increase in species and structural diversity due to reduced fire size, with a greater degree of increased species and structural diversity expected associated with the Proposed Action.

3.4 Special Status Plants

3.4.1 Affected Environment – Special Status Plants

Special status plants (SSP) are those species listed, proposed for listing, or candidates for listing under ESA, and species designated as sensitive by the BLM State Director. In Idaho, SSP are given a numeric ranking (from 1 to 4) according to scarcity and risk of extinction. Species listed under ESA are assigned a ranking of Type 1 and those with a lower threat of extinction are assigned a ranking of Type 2, 3, or 4 as described below:

- Type 1 - Federally listed Threatened or Endangered Species and Critical Habitat
- Type 2 - Range-wide / Globally Imperiled Species - High Endangerment
- Type 3 - Range-wide / Globally Imperiled Species - Moderate Endangerment
- Type 4 - Species of Concern

In Oregon, SSP are not ranked by the BLM, they include species designated as sensitive and strategic by the BLM State Director.

As with general vegetation (Section 3.3), the analysis area for SSP consists of the Project area plus a 200-foot buffer to incorporate the full extent of all SSP design feature buffers. Within the analysis area, there are 201 occurrences of 33 SSP, including 31 species in Idaho and 11 species in Oregon (Table 3.4-1; ORBIC [Oregon Biodiversity Information Center] 2015, USDI BLM 2015c, IDFG [Idaho Department of Fish and Game] 2016). For this analysis, an occurrence was considered unique if separated by 1 kilometer or greater, per NatureServe's standard separation distance (NatureServe 2004), and occurrences spanning the Idaho-Oregon border were split by this political boundary; data ranked as "historic" or "extirpated," or from prior to 1986 were excluded.

Table 3.4-1. SSP Occurrences within the Analysis Area by State

Scientific Name	Common Name	Number of Occurrences[1]		BLM Rank and/ OR Status[2]
		Idaho	Oregon	
Astragalus conjunctus	stiff milkvetch	18	0	4/none
Astragalus cusickii var. *sterilis*	barren milkvetch	5	12	3/OR-Sen
Astragalus mulfordiae	Mulford's milkvetch	1	0	2/OR-Sen
Astragalus purshii var. *ophiogenes*	Snake River milkvetch	3	0	4/none
Chaenactis cusickii	Cusick's false yarrow	7	4	2/none
Chaenactis stevioides	desert pincushion	3	0	4/none
Cryptantha propria	Malheur cryptantha	10	0	4/none
Cymopterus acaulis var. *greeleyorum*	Greeley's wavewing	5	3	3/OR-Sen
Dimeresia howellii	dimeresia	3	0	3/none

Scientific Name	Common Name	Number of Occurrences[1]		BLM Rank and/ OR Status[2]
		Idaho	Oregon	
Downingia bacigalupii	Bacigalupi's downingia	1	0	4/none
Eatonella nivea	white eatonella	6	0	4/none
Eriogonum novonudum	false naked wild buckwheat	2	0	3/none
Eriogonum salicornioides	playa buckwheat	1	3	OR-Sen
Escobaria vivipara	cushion cactus	1	0	4/none
Glyptopleura marginata	white-margined wax plant	5	0	4/none
Heteroplacidium congestum	compact earth lichen	1	0	4/none
Lomatium bentonitum	bentonite biscuitroot	0	1	OR-Sen
Lomatium cous	Cous biscuitroot	1	0	3/none
Lomatium packardiae	Packard's Desert-parsley	11	5	2/OR Strategic
Mentzelia mollis	smooth stickleaf	15	12	2/OR-Sen
Morandella angustifolia	Leslie Gulch morandella	2	2	2/will be added to list at next update
Nemacladus rigidus	rigid threadbush	4	0	4/none
Pediocactus simpsonii	Simpson's hedgehog cactus	2	0	4/none
Penstemon janishiae	Janish's penstemon	4	0	3/none
Penstemon seorsus	short-lobe beardtongue	2	0	4/none
Phacelia lutea var. *calva*	Malheur yellow phacelia	13	1	3//none
Phacelia minutissima	least phacelia	8	0	2/OR-Sen
Physaria chambersii	Chambers' bladder-pod	0	1	OR-Sen
Potamogeton diversifolius	water-thread pondweed	1	0	4/OR-Sen
Psathyrotes annua	annual brittlebrush	2	0	3/none
Sairocarpus kingii	King's snapdragon	1	0	3/none
Stanleya confertiflora	Malheur prince's plume	3	4	2/OR-Sen
Trifolium owyheense	Owyhee clover	1	14	2/OR-Sen
Total		**141**	**60**	-

[1]An occurrence was considered unique if separated by 1 kilometer or greater, and occurrences spanning the Idaho-Oregon border were split by this political boundary; excludes data ranked as “historic” or “extirpated,” or from prior to 1986.
[2]Includes Idaho BLM number rank as defined above and “OR-Sen” for those ranked as a BLM Sensitive species in Oregon.
Sources: ORBIC 2015, USDI BLM 2015c, IDFG 2016

SSP occurrences are scattered throughout the analysis area, including areas where plant communities have been modified by fire (including but not limited to the Soda Fire) and invasion of noxious weeds (USDI BLM 2012, USDI BLM 2013, USDI BLM 2015d, USDI BLM 2015e). As described under General Vegetation (Section 3.3), 62 and 58 percent of the analysis area in

Idaho and Oregon, respectively, have been previously burned, and noxious weeds are scattered throughout the analysis area, primarily along roads and drainages.

Type 1 Special Status Plants

No Type 1 SSP occur within the analysis area, including federally listed threatened or endangered species and species with USFWS-designated critical habitat.

Type 2 Special Status Plants

Eight BLM Type 2 plants occur within the analysis area: Mulford's milkvetch, Cusick's false yarrow, Packard's desert-parsley, smooth stickleaf, Leslie Gulch morandella, least phacelia, Malheur prince's plume, and Owyhee clover (Table 3.4-1). All eight species occur within the Idaho portion of the analysis area, and all but two of these species (Mulford's milkvetch and least phacelia) occur in the Oregon portion of the analysis area. Three of these species are designated as sensitive in Oregon: smooth stickleaf, Malheur prince's plume, and Owyhee clover. None of these Type 2 SSP are USFWS Proposed or Candidate species.

Type 3 Special Status Plants

Nine BLM Type 3 plants occur within the analysis area: barren milkvetch, Greeley's wavewing, dimeresia, false naked wild buckwheat, Cous biscuitroot, Janish's penstemon, Malheur yellow phacelia, annual brittlebrush, and King's snapdragon (Table 3.4-1). All nine species occur within the Idaho portion of the analysis area, and three of these species occur in the Oregon portion of the analysis area. Three of these species are designated as sensitive in Oregon: barren milkvetch, Greeley's wavewing, and Malheur yellow phacelia.

Type 4 Special Status Plants

Thirteen BLM Type 3 plants occur within the analysis area (Table 3.4-1). All thirteen species occur within the Idaho portion of the analysis area; only one species (water-thread pondweed) occurs within the Oregon portion of the analysis area, and is designated as sensitive in Oregon.

Other BLM Oregon Sensitive Species

There are three additional SSP that are designated as sensitive in Oregon, but not ranked by the BLM in Idaho: playa buckwheat, bentonite biscuitroot, and Chambers' bladder-pod. Two of these species only have occurrences in Oregon; playa buckwheat has one occurrence in Idaho, along the Idaho-Oregon border at the southern end of the analysis area.

While the analysis area has not been exhaustively inventoried, these occurrences are the result of surveys performed primarily by BLM and Idaho Power Company and their contractors, as well as records from IDFG in Idaho and ORBIC in Oregon. Following containment of the Soda Fire in 2015, the Interdisciplinary Team conducted a field reconnaissance between August 19 and August 23, and specialists assessed SSP resources within the Soda Fire perimeter, including habitat of SSP in Idaho and Oregon. The Soda Fire perimeter constitutes a large portion of the analysis area, and thus, the results of this effort are described below.

In Idaho, the identified SSP generally grow on specialized habitats, in this case often ash outcrops, sandy draws, or cindery openings. These open areas typically have low vegetative cover, and consequently were often unburned or burned at lower intensity by the Soda Fire than surrounding areas. However, the risk of conversion to invasive annual species is a moderate to extreme threat that could have major consequences to these SSP within the Soda Fire perimeter, particularly in Idaho. Several rehabilitation treatments were implemented, or will be implemented, following the Soda Fire that are designed to benefit SSPs and their habitats, including repairing fences, constructing barrier fences, noxious weed control, and habitat enhancement (USDI BLM 2015a.

Similar to Idaho, some of the SSP identified within the Soda Fire perimeter in Oregon generally grow in specialized habitats with low vegetative cover. Due to the harsh soils (ash and clay outcrops) these plants grow on, there is little vegetation present at the sites that would carry fire, or sustain fire for a period of time that would damage the plants. In Oregon, no treatments were identified following the Soda Fire designed to benefit these SSP.

3.4.2 Environmental Consequences – Special Status Plants

3.4.2.1 Alternative 1 – No Action

A fuel breaks network would not be created and fire suppression personnel would utilize existing paved and county roads and natural topographic features to hold and control wildfire. If no action is taken, SSP and associated habitat would not be directly impacted by the establishment of fuel breaks and the associated effects as discussed in the following sections. However, under this alternative, large scale fires are expected to continue to burn throughout the analysis area. Over the short- and long-term, this trend is expected to continue to modify SSP habitats, burning remnant and recovering plant communities, and limit the potential for population recovery. However, SSP that thrive in harsh soils where there is little vegetation present would not likely be effected. Wildfire typically results in changes in both structure and composition of plant communities. Change occurs in the form of loss of shrub cover and dominance by non-native invasive annual plants or perennial grasses seeded to impede invasive species. These changes are accompanied by modification in the amount and arrangement of open plant interspaces, areas shaded and exposed to sunlight, and seasonal and daily moisture distribution. Thus, structural and compositional changes that result post-fire could change both the physical environment, as well as competition between plants for resources.

Activities associated with fire suppression and post-fire stabilization and rehabilitation, such as dozer line establishment or mechanical seeding, can cause soil surface disturbance, resulting in damage or mortality of undetected SSPs or their seed banks. Current and on-going post-fire stabilization and rehabilitation projects attempt to emulate pre-fire plant community structure and composition to the degree possible. Lack of treatment where natural recovery is not possible would likely result in dominance by non-native invasive annual plants, which would also be contradictory to SSP population recovery. However, SSP that thrive in harsh soils where there is little vegetation present would not likely be effected.

In addition, frequent, repeated fires can result in areas of soil loss and deposition that can modify habitats in both burned and adjacent unburned areas. This could result in plant or seed burial or exposure, as well as changes in soil physical and chemical characteristics that could make habitats unsuitable for continued occupation.

3.4.2.2 General Effects of Action Alternatives

GIS data from IDFG, ORBIC, and BLM (2016 and 2015) were reviewed relative to the proposed prostrate kochia, other (natural, seeded non-kochia), and targeted grazing fuel breaks to determine the potential for SSP presence in the analysis area. Twenty-three SSP were identified as potentially impacted by these treatments (Table 3.4-2).

Table 3.4-2. Habitat and Occurrences of SSP Potentially Impacted

Common Name	Habitat	Occurrence Details
stiff milkvetch	Sagebrush scrub and grassland on volcanic basalt soils.	Throughout previously burned and unburned sagebrush scrub in Idaho.
barren milkvetch	Dry ash areas, gravelly bluffs, and Wyoming big sagebrush, bitterbrush, and grassland habitat between 2,600 and 4,900 feet in elevation.	On ash outcrops and bluffs within Soda Fuel perimeter, primarily in Malheur County, Oregon and adjacent Owyhee County, Idaho
Snake River milkvetch	Wyoming big sagebrush/salt desert shrub and grassland.	Open, often shallow soil areas in previously burned areas in Idaho.
Cusick's pincushion	Wyoming big sagebrush and salt desert shrub.	Ash outcrops primarily in previously burned areas in Oregon and Idaho.
desert pincushion	Open, usually sandy sites at elevations to 6,200 feet in elevation.	Within and outside previously burned areas in Idaho, on eastern edge of Project
Malheur cryptantha	Sagebrush and grassland.	Rocky openings or shallow soil scattered throughout analysis area in Idaho.
Greeley's wavewing	Occupies Wyoming big sagebrush sites that experience a lot of soil movement.	Clay soil ash outcrops through analysis area in Idaho and Oregon.
white eatonella	Dry sandy or volcanic soils in salt desert shrub habitats on barren sites surrounded by sagebrush.	Open, loose-soil areas within and outside previously burned areas in Idaho, on eastern edge of analysis area.
false naked wild buckwheat	Wyoming big sagebrush/salt desert shrub and grassland on volcanic ash soils.	Burned and unburned areas on northeaster edge of analysis area in Idaho.
playa buckwheat	Dry, sparsely vegetated, white, ashy clay soils in shadscale-budsage and Wyoming sagebrush communities	Previously burned areas in Oregon.
white-margined wax plant	Dry, sandy-gravelly or loose ash soils.	Open, loose-soil areas on burned and unburned areas in Idaho, on the eastern portion of the analysis area.
compact earth lichen	Open desert scrub.	Open, desert pavement areas on the eastern edge of the analysis area in Idaho.
Packard's milkvetch	Volcanic ash and rocky clay soils in sagebrush.	Clay/ash influenced sagebrush stands in burned and unburned areas in Idaho and Oregon.
smooth stickleaf	Dry, open, nearly barren soil comprised of clay and volcanic ash	On ash outcrops and clay and volcanic ash deposits within Soda Fire perimeter; endemic to Malheur County, Oregon in

Common Name	Habitat	Occurrence Details
	deposits with high potassium content from 4,200 to 5,200 feet.	the Succor Creek Drainage and Owyhee County, Idaho.
Leslie Gulch morandella	Open ash/talus slopes.	Within the Soda Fire perimeter along the Idaho/Oregon border in the central to south central portion of the analysis area.
rigid threadbush	Loose, sandy, cindery or ashy outcrops, cracks in basalt, or in dried mud in shadscale-sagebrush zone.	Cindery soil openings in burned and unburned areas in Idaho.
Janish's penstemon	Volcanic ash-clay soils or lakebed sediments in Wyoming big sagebrush/salt desert shrub.	Burned and un-burned areas along eastern edge of analysis area in Idaho.
Malheur yellow phacelia	Volcanic ash soils in Wyoming big sagebrush and salt desert shrub.	Ash outcrops in center of analysis area, in Idaho.
least phacelia	Aspen/tall forb meadows, springs, along streambanks, wetter stream terraces, and snow bank areas.	In unburned area in southern portion of analysis area in Idaho.
Chambers' bladder-pod	Limestone soils in the mountains; washes, hillsides, ridges.	In a previously burned area along Hwy 95 in Oregon.
annual brittlebrush	Salt desert shrub communities.	In an unburned area on the southeastern edge of the analysis area in Idaho.
Malheur prince’s plume	Open, dry, vernally moist habitats in the valleys and foothills on shallow stony basalt.	Ash outcrops in burned and unburned areas in Idaho and Oregon.
Owyhee clover	Barren, loose talus or volcanic ash slopes in Wyoming sagebrush grasslands.	In ash openings and in loose talus or ash slopes within burned and unburned areas, primarily in Malheur County, Oregon.

Sources: Wigglesworth 2012, Hagwood 2006, USDI BLM 2000

Mechanical vegetation removal, seedbed preparation treatments, and targeted grazing implemented under either action alternative would result in soil surface disturbance and vegetation removal or trampling, which could impact SSP occurrences within the proposed treatment areas. Application of design features to protect SSP outlined in Section 2.4.4 (e.g., avoidance buffers and other stipulations) would limit or eliminate impact potential. However, if present and not avoided, SSP individuals or occurrences would likely be damaged or destroyed by mowing, burning, chemical and/or mechanical seedbed preparation treatments.

Mechanical seedbed preparation treatments would result in disruption of SSP individuals and habitat located within the proposed fuel break treatment areas. This would result in a mixing of soil layers, which could affect SSP function and the suitability of microsites that support SSPs. However, inventories would be conducted prior to implementing fuel break treatment, and SSP occurrences would be avoided as described under Design Features in Section 2.4.4.

Disturbance and vegetation removal resulting from fuel break treatment implementation of the action alternatives could result in short-term increased potential for introduction and/or spread of noxious weeds and invasive plants within and beyond the proposed fuel break corridors, as described in the General Vegetation including Noxious and Invasive Weeds section (Section 3.3). This could have an indirect effect of competition with known or undetected SSP occurrences outside of the proposed treatment areas. However, this potential is considered to be low due to noxious weed control and maintenance measures described in Chapter 2.

A secondary impact of the action alternatives is the potential spread of prostrate kochia into SSP habitat outside of the treatment areas. There is some potential for prostrate kochia to spread into existing sagebrush and/or perennial bunchgrass stands with open and available niches. Reported recruitment or spread of prostrate kochia has been most strongly correlated with the level of soil disturbance in the surrounding area, lack of competition from other vegetation, and open spaces surrounding established prostrate kochia plants; spread was also correlated with prevailing winds but this was determined to be of less significance (Harrison et al. 2000) likely because the seed for this plant has no mechanism for wind dispersal. Waldron et al. (2001) collected spread data from 81 prostrate kochia seedings and found a maximum spread of 1,263 feet with a recruitment margin ranging from 0 to 98 feet with an average recruitment margin of 20 feet. Smooth stickleaf is a species that grows in dry, open nearly barren soil. This fits the description of the habitat most strongly correlated with recruitment or spread of prostrate kochia. Given that smooth stickleaf and prostrate kochia grow in similar environments and that the design feature of a general avoidance buffer of 200 feet around SSP occurrences, there is a possibility the prostrate kochia could spread to the smooth stickleaf plant sites and may cause detrimental competition.

However, with proposed fuel break monitoring the probability of long-range dispersal and prostrate kochia establishment outside of the proposed treatment areas due to animal movements, seed consumption, or off-highway vehicles are considered to be minimal to negligible for reasons detailed in the Proposed Action - Vegetation and Fuels Management Impacts (Section 3.3.2).

3.4.2.3 Alternative 2 – Proposed Action

In Idaho, there are 42 known SSP occurrences consisting of 19 species within the Proposed Action footprint, and 18 occurrences consisting of 8 species in Oregon. The Proposed Action footprint consists of the footprint of all the 35-foot road width with fuel breaks and targeted grazing.

Known SSP occurrences within the Proposed Action footprint include 42 occurrences within the fuel breaks in Idaho (7 in prostrate kochia and 35 in other), and 18 occurrences in Oregon (1 in prostrate kochia and 17 in other) (Table 3.4-3). Other fuel breaks include seeded fuel breaks where species other than prostrate kochia would be seeded and natural fuel breaks, as described in Section 2.4.

Table 3.4-3. Number of SSP Occurrences within Fuel Breaks in Idaho and Oregon as a Result of the Proposed Action

Common Name	Idaho		Oregon	
	Kochia	Other	Kochia	Other
stiff milkvetch	0	7	0	0
barren milkvetch	0	1	0	4
Snake River milkvetch	0	1	0	0

Common Name	Idaho		Oregon	
	Kochia	Other	Kochia	Other
Cusick's false yarrow	0	4	0	0
desert pincushion	0	1	0	0
Malheur cryptantha	1	1	0	0
Greeley's wavewing	1	0	1	1
white eatonella	1	1	0	0
false naked wild buckwheat	1	0	0	0
Playa buckwheat	0	0	0	2
white-margined wax plant	2[1]	2[1]	0	0
compact earth lichen	0	1	0	0
Packard's desert-parsley	0	1	0	3
smooth stickleaf	0	2	0	1
Leslie Gulch morandella	0	0	0	1
rigid threadbush	0	2	0	0
Janish's penstemon	1	0	0	0
Malheur yellow phacelia	0	3	0	0
least phacelia	0	5	0	0
Chambers' bladder-pod	0	0	0	1
annual brittlebrush	0	2	0	0
Malheur prince's plume	0	1	0	0
Owyhee clover	0	0	0	4
TOTAL	**7**	**35**	**1**	**17**

[1]Two white-margined wax plant occurrences fall within the Proposed Action analysis area. Each of these occurrences are crossed by both the prostrate Kochia and other fuel breaks; these impacts are reflected in this table, but not double counted where summarized in text. As a result, the total occurrences listed here do not match the total occurrences listed in text.

Targeted grazing would be conducted on the northern edge of the analysis area, as described in section 2.4. Under the Proposed Action 5 SSP occurrences in Idaho and no occurrences in Oregon are located within this targeted grazing area.

Table 3.4-4. Number of SSP Occurrences within Targeted Grazing Areas in Idaho and Oregon as a Result of the Proposed Action

Common Name	Idaho	Oregon
stiff milkvetch	1	0
barren milkvetch	0	0
Snake River milkvetch	0	0
Cusick's false yarrow	2	0
desert pincushion	0	0
Greeley's wavewing	1	0
white eatonella	0	0
false naked wild buckwheat	0	0
playa buckwheat	0	0

Common Name	Idaho	Oregon
white-margined wax plant	0	0
compact earth lichen	0	0
Packard's desert-parsley	0	0
smooth stickleaf	1	0
Malheur yellow phacelia	0	0
least phacelia	0	0
Chambers' bladder-pod	0	0
annual brittlebrush	0	0
Malheur prince's plume	0	0
Owyhee clover	0	0
TOTAL	**5**	**0**

3.4.2.4 Alternative 3 – Modified Proposed Action

In Idaho, there are 31 known SSP occurrences consisting of 15 species within the Modified Proposed Action footprint, and 15 occurrences consisting of 7 species in Oregon; 9 fewer occurrences and 4 fewer species in Idaho, and 3 fewer occurrences and one fewer species in Oregon than the Proposed Action. The Modified Proposed Action footprint consists of the footprint of all treatments, including fuel breaks without the 35-feet of road maintenance/improvement, and targeted grazing.

Known SSP occurrences within the Modified Proposed Action footprint includes 31 occurrences within prostrate kochia and other fuel breaks in Idaho, and 15 occurrences within fuel breaks in Oregon (Table 3.4-5).

Table 3.4-5. Number of SSP Occurrences within Fuel Breaks in Idaho and Oregon as a Result of the Modified Proposed Action

Common Name	Idaho		Oregon	
	Kochia	Other	Kochia	Other
stiff milkvetch	0	5	0	0
barren milkvetch	0	1	0	2
Snake River milkvetch	0	1	0	0
Cusick's false yarrow	0	4	0	0
desert pincushion	0	1	0	0
Greeley's wavewing	1	0	1	1
white eatonella	1	1	0	0
false naked wild buckwheat	1	0	0	0
playa buckwheat	0	0	0	2
white-margined wax plant	1[1]	2[1]	0	0
compact earth lichen	0	1	0	0
Packard's desert-parsley	0	0	0	3
smooth stickleaf	0	2	0	0

Common Name	Idaho		Oregon	
	Kochia	Other	Kochia	Other
Leslie Gulch modardella	0	0	0	1
Malheur rellow phacelia	0	3	0	0
least phacelia	0	5	0	0
Chambers' bladder-pod	0	0	0	1
annual brittlebrush	0	1	0	0
Malheur prince's plume	0	1	0	0
Owyhee clover	0	0	0	4
TOTAL	4	28	1	14

[1]Two white-margined wax plant occurrences would be impacted by the Modified Proposed Action fuel breaks. One of these occurrences is crossed by only the prostrate Kochia fuel break, while the other is crossed by both the prostrate Kochia and other fuel breaks; these impacts are reflected in this table, but not double counted where summarized in text. As a result, the total occurrence listed here do not match the total occurrences listed in text.

Under the Modified Proposed Action, the same number of occurrences as the Proposed Action (5 in Idaho and none in Oregon) are located within the targeted grazing area.

Direct and indirect effects to SSP from treatments under the Modified Proposed Action would be similar in nature to those under the Proposed Action; however, fewer occurrences of fewer SSP have the potential to be impacted under the Modified Proposed Action. Fewer acres treated would result in less vegetation converted to fuel breaks and larger polygons defined by fuel breaks. These larger polygons would be at a greater risk for wildland fire than the polygons protected under Alternative 2, and therefore, all SSP occurrences would be at greater risk of destruction or modification from fire.

3.4.3 Cumulative Effects – Special Status Plants

The cumulative effects analysis area for SSPs is the same as the vegetation analysis area, which includes the proposed Project area and a 200-foot buffer. Generally, the past, present, and foreseeable future actions and cumulative effects relative to SSPs resulting from these actions are similar to those described above for general vegetation (Section 3.3). However, the long-term effect of native habitat declines with no action would be more severe for SSP due to specificity of habitats, including pollinator habitat, and limited distribution. Actions that could cumulatively affect SSP are construction and maintenance of the Gateway West Transmission Line project and Boardman to Hemingway Transmission Line project; vegetation treatments including post-fire treatments associated with the emergency stabilization and burned area rehabilitation plan (USDI BLM 2015a), and noxious weed management; ongoing livestock grazing; recreation; and wildfire.

Under the No Action alternative, the effects of past, present, and foreseeable actions in the cumulative effects analysis area are expected to continue current trends for SSP. This means that SSP and their pollinator habitats would continue to be converted to invasive herbaceous plant communities, and that fire will likely remove existing as well as recovering shrub stands. When added to either the Proposed Action or Modified Proposed Action, SSP populations within the analysis area may experience improved conditions and habitat quality due to reduced fire size, with a greater degree of improved conditions and habitat quality expected associated with the Proposed Action.

3.5 Wildlife Including Fish and Special Status Animal Species

3.5.1 Affected Environment – Wildlife Including Fish and Special Status Animal Species

The project area is located in the northwestern portion of the Owyhee Mountains where the Snake River Plain and Northern Basin and Range Level III ecoregions meet (U.S. Environmental Protection Agency 2011). It is spread across five Level IV ecoregions, including Partly Forested Mountains, Semiarid Uplands, Owyhee Uplands and Canyons, Unwooded Alkaline Foothills, and the Treasure Valley (U.S. Environmental Protection Agency 2011). Elevations range from 2,300 feet to 7,400 feet.

Wildlife habitat within the project area consists mostly of shrub-steppe plant communities with a typical sagebrush overstory and varying amounts of perennial bunchgrasses and invasive annuals in the understory. Lower elevations tend to have a lower proportion of perennial bunchgrasses. In addition to sage-steppe communities, other dominant upland wildlife habitats include native grasslands, annual grasslands, juniper woodlands, mountain shrublands, and sparsely vegetated rocky outcrops and canyons. Riparian/wetland wildlife habitats include wet meadow complexes and woody/herbaceous riparian areas along perennial and intermittent streams and around springs, seeps, and reservoirs. Annual grasslands dominated by cheatgrass and medusahead are prevalent at low- to mid-elevations. Cheatgrass is common throughout the project area, while medusahead is most abundant in the south and southwest portion of the project area.

Changes in vegetation communities occurring over the past 150 years have resulted in modified wildlife habitats within the project area. The introduction of Eurasian annual grasses (cheatgrass and medusahead) into the western United States in the latter part of the 1800s has greatly modified wildlife habitats, and these invasive species continue to expand to this day. This has resulted in a significant increase in fire fuels and frequency of wildfires, leading to reductions of sagebrush cover on the landscape at lower elevation drier habitats (Miller et al. 2011). At higher elevations, there has been an increased encroachment of western juniper into sagebrush communities following post-European settlement. Juniper woodlands encroach into sagebrush communities when the intervals between fires become long enough for juniper to become established and mature.

The Soda Fire consumed a large portion of the project area in 2015. Most of the sagebrush is not anticipated to recover because of the intensity of the fire. Perennial grasslands, forbs, and riparian vegetation was also consumed by the fire.

For consistency with the vegetation descriptions in Section 3.3, discussion of wildlife habitat will utilize the vegetation community type terms. In general, wildlife habitat includes conifer forests, hardwood forest, shrubland, grassland, exotic herbaceous, riparian, and open water.

The analysis of wildlife includes big game, migratory birds, and special status animals. Big game species analyzed include mule deer (*Odocoileus hemionus*), pronghorn antelope (*Antilocarpa* *americana*), and California bighorn sheep (*Ovis canadensis californiana*). Streams with documented fish presence are analyzed to cover all fish species. The analysis of migratory birds includes general discussions on birds and associations with the dominant habitat types within the project area as well as an analysis of golden eagle (*Aquila chrysaetos*). Special status animals analyzed include greater sage-grouse (*Centrocercus urophasianus*), Columbia River redbant trout (*Oncorhynchus mykiss gairdneri*), and Columbia spotted frog. A general focal species approach to the analysis will focus more detail on greater sage-grouse, golden eagle, and redband trout.

Big Game

The analysis area for all big game species is the project area. Acres of habitat within the analysis area for each species is presented.

Pronghorn Antelope

Pronghorn are primarily a forb-eating species that prefer open landscapes where potential threats can be seen at long distances. Pronghorn antelope are associated with sagebrush and grassland steppes of the intermountain and Great Basin regions (Yoakum 1980). Pronghorn habitat in the analysis area is characterized by sagebrush shrublands and grasslands bisected by deep canyons. Generally, pronghorn avoid areas with sagebrush taller than about 30 inches. In winter, sagebrush can comprise up to 80 percent of the pronghorn diet.

The analysis area for pronghorn contains year-round and seasonal habitat, including areas that are important for pronghorn overwinter survival such as Shares Basin; the area west of Murphy, Idaho; McBride Creek along US 95 at the Oregon – Idaho border; the area between Owyhee Ridge and Succor Creek in Oregon; and the area around Sheaville, Oregon. Shares Basin and the area west of Murphy, Idaho, burned in the Soda Fire. GIS data from Idaho and Oregon BLM identified pronghorn habitat within the analysis area as defined in Table 3.5-1.

Table 3.5-1. Acres of Pronghorn Habitat within the Big Game Analysis Area

Habitat Type	Total Acres	Inside Burn Area	Outside Burn Area
Spring/Summer/Fall	188,068	119,862	68,206
Year-long	47,373	12,519	34,854
Winter	36,788	26,275	10,513
Total	**272,229**	**158,656**	**113,573**

A majority of pronghorn habitat within the big game analysis area is spring/summer/fall and year-long habitat, with approximately 14 percent being winter habitat. The largest proportion of pronghorn habitat within the big game analysis area that burned was winter habitat, with approximately 70 percent within the burned area. An overall majority of the pronghorn habitat within the big game analysis area burned in the Soda Fire, and areas of forage habitat for pronghorn was temporarily lost. Invasion of noxious weeds and annual grasses are a threat to pronghorn habitat (IDFG 2013a), and will likely result in the permanent conversion of some portions of pronghorn habitat to non-habitat within the burned portions of the analysis area. Shrub mortality from the Soda Fire was significant, which may create more year-long forage habitat for pronghorn but will also reduce the functionality of winter habitat by removal of an important winter browse component.

Mule Deer

Mule deer are habitat generalists and can be found in habitat throughout the big game analysis area, including shrubland and conifer forest habitat as well as hardwood forests and riparian areas.

The analysis area for mule deer is the project area. The analysis area contains year-round and seasonal habitat, including areas that are important for mule deer overwinter survival such as the area just east of Little Sugar Loaf between Diamond Creek and Sinker Creek in Idaho; the area southwest of Hemingway Butte in Idaho, above Reynolds Creek; the area near Buck Mountain and Shares Snout in Idaho; the area east of the Owyhee Reservoir from Mahogany Mountain north to Long Draw in Oregon; the area between Texas Basin and Succor Creek Reservoir in Idaho; and the area on the west slopes of Swisher Mountain and the Baxter Basin in Idaho. Mule deer winter habitat in Oregon was not burned during the Soda Fire and a portion of the Buck Mountain and Shares Snout winter habitat in Idaho did not burn or had a low burn severity. GIS data from Idaho and Oregon BLM identified mule deer habitat within the big game analysis area as defined in Table 3.5-2.

Table 3.5-2. Acres of Mule Deer Habitat within the Big Game Analysis Area

Habitat Type	Total Acres	Inside Burn Area	Outside Burn Area
Spring/Summer/Fall	103,079	25,905	77,174
Year-long	285,437	172,214	113,223
Winter	145,058	47,193	97,865
Total	**533,573**	**245,312**	**288,261**

A significant portion of mule deer habitat within the big game analysis area burned in the Soda Fire, and areas of forage and cover habitat for mule deer was temporarily lost. Shrub mortality from the Soda Fire was significant, which is likely to cause some mule deer to move to appropriate habitat outside of the burned portion of the analysis area to meet life history needs.

California Bighorn Sheep

California bighorn sheep are an Idaho BLM Type 2 special status animal, but are not considered a special status species by Oregon BLM. Bighorn sheep rely mostly on grasses as forage, while forbs and shrubs are used seasonally (ODFW 2003). In general, bighorn sheep prefer rugged, open habitats with high visibility of their surroundings. Survival is positively correlated with amount of cliffrock, rimrock, and rocky outcroppings present on the landscape. Rocky outcrops are particularly important for lambing and escape from predators. Current bighorn sheep populations in both Idaho and Oregon are below IDFG and ODFW management objectives. Present-day stressors on bighorn sheep individuals and populations include habitat degradation, recreation, predation, competition with livestock and wild horses, and disease (IDFG 2010).

The big game analysis contains the areas of bighorn sheep distribution as delineated by each state and lambing areas identified within Idaho. Lambing are completely contained within the bighorn sheep distribution within Idaho. IDFG manages bighorn sheep within the Owyhee Front Population Management Unit (PMU, IDFG 2013b). This PMU is within the foothills above the Snake River plain and contains scattered pockets of suitable escape terrain In Oregon, the Lower Owyhee River bighorn sheep herd area overlaps with the analysis area. The bighorn sheep in this area utilize the abundant escape terrain adjacent to the Owyhee Reservoir such as Leslie Gulch and the Hole in the Ground areas. The analysis area includes the northeastern portion of the herd area which contains habitat that is less likely to be utilized by bighorn sheep, such as Three Fingers Gulch and Steamboat Ridge areas. Bighorn sheep within the Lower Owyhee River herd are currently experiencing a disease outbreak that is expected to result in sheep die-offs of unknown extent. GIS data from Idaho BLM and ODFW identified bighorn sheep habitat within the big game analysis area as defined in Table 3.5-3.

Table 3.5-3. Acres of Bighorn Habitat within the Big Game Analysis Area

Habitat Type	Total Acres	Inside Burn Area	Outside Burn Area
Bighorn Distribution	236,937	144,443	92,495
Lambing Areas (Idaho only)	21,954	21,954	0

A majority of the bighorn habitat within the analysis area burned in the Soda Fire, including all of the lambing areas in Idaho. None of the Oregon bighorn sheep herd area within the analysis area burned. Forage habitat (grasslands) for bighorn sheep in the Reynolds Creek area was temporarily lost.

Fish

The analysis area for fish is the project area. Within the analysis area there are a total of 199 miles of creeks with documented fish presence. This includes 21 creeks supporting 7 different species of fish (Table 3.5-4).

Table 3.5-4. Fish Species Presence within the Fish Analysis Area

Common Name	Scientific Name	Location
Bridgelip sucker	*Catostomus columbianus*	Jordan Creek, Sinker Creek, and Succor Creek
Brook trout	*Salvelinus fontinalis*	Jordan Creek
Columbia River redband trout	*Oncorhynchus mykiss gairdneri*	Carter Creek, Cow Creek, Jackson Creek, Jordan Creek, Jump Creek, Little Cow Creek, Macks Creek, McBride Creek, Reynolds Creek, Salmon Creek, Scotch Bob Creek, Sinker Creek, Soda Creek, South Fork Carter Creek, Spring Creek, Succor Creek, Trout Creek, and 3 unnamed tributaries
Longnose dace	*Rhinichthys cataractae*	Succor Creek
Rainbow trout	*Oncorhynchus mykiss*	Jordan Creek, Sinker Creek, and Succor Creek
Redside shiner	*Richardsonius balteatus*	Jordan Creek and Succor Creek
Speckled dace	*Rhinichthys osculus*	Jordan Creek, Reynolds Creek, Sinker Creek, and Squaw Creek

Of the 199 miles of fish-bearing creeks within the analysis area for fish, approximately 80 miles were within the burned area of the Soda Fire. A significant percentage of the riparian areas within the burned area burned intensely, consuming the herbaceous understory and removing woody riparian vegetation in some areas. Areas sheltered from the fire front or within steeper canyons burned at a lower intensity, typically leaving vegetated islands in areas.

Migratory Birds

The analysis area for migratory birds is the project area. The shrubland habitat present prior to the Soda Fire supported several species of sagebrush obligate and facultative migratory birds including greater sage-grouse (sage-grouse), sage thrasher (*Oreoscoptes montanus*), sagebrush sparrow (*Artemisiospiza nevadensis*), Brewer's sparrow (*Spizella breweri*), and loggerhead shrike (*Lanius ludovicianus*). Other migratory birds that utilize shrubland and grassland habitats in the analysis area include long-billed curlew (*Numenius americanus*), vesper sparrow (*Pooecetes gramineus*), lark sparrow (*Chondestes grammacus*), savannah sparrow (*Passerculus sandwichensis*), horned lark (*Eremophila alpestris*), and western meadowlark (*Stumella neglecta*). Red-winged blackbird (*Agelaius phoeniceus*), Bullock's oriole (*Icterus bullockii*), and Wison's snipe (*Gallinago delicate*) are associated with riparian habitats within the analysis area, while rock wrens (*Salpinctes obsoletus*), rock pigeons (*Columba livia*), and cliff swallows (*Petrochelidon pyrrhonota*) are common within canyons and along rock outcrops. Conifer forests in the analysis area support species such as flycatchers (*Empidonax spp*), Cassin's finch (*Haemorhous cassinii*), and western tanager (*Piranga ludoviciana*).

The migratory bird analysis area occurs within Bird Conservation Region 9, the Great Basin (USDI USFWS 2008). Species listed by the USFWS as Birds of Conservation Concern that are likely to occur in the analysis area are golden eagle, ferruginous hawk (*Buteo regalis*), long-billed curlew, calliope hummingbird (*Stellula calliope*), Lewis's woodpecker (*Melanerpes lewis*), loggerhead shrike, sage thrasher, Brewer's sparrow, sagebrush sparrow, and green-tailed towhee (*Pipilo chlorurus*) (USDI USFWS 2008). Lewis's woodpecker is on both the Oregon and Idaho BLM's special status species lists; while the golden eagle, ferruginous hawk, long-billed curlew, loggerhead shrike, sage thrasher, Brewer's sparrow, sagebrush sparrow, and green-tailed towhee are special status species within Idaho.

The Soda Fire temporarily eliminated nearly all migratory bird habitat within the perimeter, with the exception of small islands of unburned or low burn severity areas. Migratory birds that require shrubland, conifer forest, and hardwood forest have been displaced from the burned area and their abundance will remain low for several years while those habitats recover. Migratory birds that utilize grassland (e.g., horned lark and long-billed curlew) will return to the burned area earlier as those habitats are the first to recover from wildfire.

Golden Eagle

Golden eagles are a Type 2 BLM special status animal in Idaho, but are not considered a special status species within Oregon. Golden eagles are protected under The Bald and Golden Eagle Act (1962) as amended. BLM manages golden eagles under Executive Order 13186 Sec. 3, which directs federal agencies to promote the conservation of migratory bird populations.

The analysis area for golden eagles includes the project area plus a 0.5-mile buffer of the project area to account for golden eagle nests that fall within the restriction buffer identified as a RDF in Chapter 2. A review of IDFG and BLM datasets identify a total of 77 golden eagle nest locations within the golden eagle analysis area. Golden eagles are known to use and defend foraging areas and up to 13 nests within a territory (Kochert et al. 1999). Therefore, the number of active golden eagle nests within the golden eagle analysis area on any given year are expected to be far fewer than 77.

Golden eagles in southwestern Idaho (and presumable southeastern Oregon) typically occupy territories year-round and rely on black-tailed jackrabbits (*Lepus* californicus) as their primary prey (Kochert et al. 1999). Ground squirrels (U*rocitellus spp)*, rock doves, reptiles, yellow-bellied marmots (*Marmota flaviventris*), and cottontail rabbit (*Sylvilagus nuttallii*) are also important prey items (Marzluff et al. 1997). Golden eagle territories typically contain a significant shrubland component (such as sagebrush or rabbitbrush) that supports black-tailed jackrabbits; eagles tend to avoid grassland and agriculture habitat (Marzluff et al. 1997).

The significant loss of shrublands within the burned area has likely had a negative effect on golden eagles (Kochert et al. 1999). Of the 77 nest locations within the golden eagle analysis area, 57 of those occur within the burned area. However, loss of shrubland habitat from fire is not a significant predictor of territory occupancy or nesting success post-fire (Kochert et al. 1999). Variables such as neighboring territory occupancy, ability to use and productivity of alternate foraging habitat, and the underlying quality of the breeding pair (previous years of high nest success) within a territory play important roles in post-fire nesting success (Kochert et al. 1999).

Special Status Animals

Greater Sage-grouse

Sage-grouse are a broadly distributed species that are dependent on a diversity of seasonal habitats and include some wide-ranging populations; therefore, they are expected to be vulnerable to changes to the sagebrush ecosystem. Due to these factors, the focal species concept (Mills 2007) is applicable because sage-grouse can serve as an umbrella species for broader conservation of the sagebrush habitats across the West (Hanser & Knick 2011). The analysis of sage-grouse can be assumed to be similar for other sagebrush-dependent species such as pygmy rabbit, sage sparrows, and sage thrashers, as well as generalist species such as mule deer and pronghorn antelope.

The analysis area for sage-grouse was established by following the Project Analysis Area Method for Permitting Surface Disturbance Activities in Appendix E of the ARMPAs. This involved buffering the proposed action disturbance footprint by 4 miles. Then, all occupied sage-grouse leks within the buffer were also buffered by 4 miles. The proposed action buffer and lek buffer are combined to create the analysis area for sage-grouse (Figure 3.5-1).

The sage-grouse analysis area is within the Western Association of Fish and Wildlife Management Agencies (WAFWA) Snake River Plain Management Zone (MZ; Stiver et al. 2006). The Northern Great Basin population of sage-grouse within the Snake River Plain MZ (Garton et al. 2011) is a large population in Nevada, southeastern Oregon, southwestern Idaho, and northwestern Utah). Of the three subpopulations identified by Connelly et al. (2004) within the Northern Great Basin population, the north-central Nevada/southeast Oregon/southwest Idaho (hereafter Owyhee) subpopulation overlaps the analysis area. Within the analysis area, the Owyhee subpopulation consists of sage-grouse managed within the West Owyhee Conservation Area in Idaho and the Cow Lakes Priority Area for Conservation (PAC) in Oregon.

Habitat conditions have deteriorated or been altered to some degree throughout the entire distribution of sage-grouse by a combination of man-made and natural forces (e.g., livestock management, conversion to agriculture, wildfire, fire suppression, and natural progression) on the plant community over time. This has resulted in the loss of native bunchgrasses and the increased dominance of short-statured species such as Sandberg bluegrass and exotic species such as cheatgrass and medusahead. These forces have further contributed to increasing the frequency of wildfire in some habitat types at low-to-mid elevations removing sagebrush, and affecting sagebrush regeneration and reestablishment; increasing the spread of invasive species; and at mid-to-higher elevation habitat increasing the distribution and density of western juniper with increased encroachment into sagebrush habitats at these elevations. This has caused local extirpations or declines in sage-grouse populations throughout their historical range and within the analysis area. An Idaho population analysis conducted by Connelly et al. (2004) suggests a long-term decline for sage-grouse within the state. More recently, Garton et al. (2011) conducted a population analysis of the Northern Great Basin population based on data from 1965 to 2007. During the assessment period, the proportion of active leks decreased and average number of males per active lek declined by 17 percent (Garton et al. 2011).

Priority Habitat Management Areas (PHMA), Important Habitat Management Areas (IHMA; Idaho only), and General Habitat Management Areas (GHMA) occur within the analysis area. PHMA, IHMA, and GHMA are defined under the ARMPAs to guide BLM management of sage-grouse habitat. PHMA are BLM-administered lands identified as having the highest value to maintaining sustainable sage-grouse populations. Areas of PHMA largely coincide with areas identified as priority areas for conservation in the USFWS's Conservation Objectives: Final Report (USDI USFWS 2013a). These areas include breeding, late brood-rearing, winter concentration areas, and migration or connectivity corridors. IHMA are BLM-administered lands that provide a management buffer for PHMA and connect patches of PHMA. IHMA encompass areas of generally moderate to high conservation value habitat and populations but that are not as important as PHMA. IHMA is only designated within Idaho. GHMA are BLM-administered lands where some special management will apply to sustain sage-grouse populations; areas of occupied seasonal or year-round habitat outside of PHMA or IHMA.

The ARMPAs also identify specific sagebrush focal areas (SFA), which are a subset of PHMA and encompass sage-grouse stronghold areas that have the highest densities of sage-grouse and other criteria important for the persistence of the species. SFA are managed as PHMA, except that some uses are restricted and SFA are prioritized for vegetation management and conservation actions. There are no SFA within the sage-grouse analysis area.

Table 3.5-5. Acres of PHMA, IHMA, and GHMA within the Sage-Grouse Analysis Area

Habitat Management Area	Acres	Inside Burn Area	Outside Burn Area
PHMA	278,962	48,450	230,512
IHMA	358,230	190,526	167,704
GHMA	193,397	36,446	156,951
Total	**830,589**	**275,422**	**555,167**

The greater sage-grouse is a sagebrush-obligate species that requires large areas of relatively undisturbed sagebrush steppe habitat. Within this requisite sagebrush landscape, important seasonal habitats (e.g., wet meadows, higher elevation mesic shrublands) are also necessary (Connelly et al. 2000). Sage-grouse traditionally congregate on communal strutting grounds (i.e., leks) from April to early May. The nesting season occurs soon after, extending from May to early June. Broods remain with females for several more months, and as seasonal changes occur, they move from early brood-rearing areas (e.g., forb- and insect-rich upland areas surrounding nest sites) to late brood-rearing and summer habitats (e.g., wet meadows and riparian areas) from June to August. Sage-grouse seasonal ranges associated with breeding (i.e., lekking, nesting, and early brood-rearing), late brood-rearing/summer, and winter habitats occur within the analysis area to varying degrees. Within Idaho, the BLM has mapped sage-grouse nesting and late brood rearing habitat and winter habitat using data from IDFG. Table 3.5-6 shows the acres of nesting/late brood rearing habitat and winter habitat within the sage-grouse analysis area. These two seasonal habitats have significant overlap within the sage-grouse analysis area (Figure 3.5-2). Oregon does not have similar seasonal habitat delineated within the sage-grouse analysis area.

Table 3.5-6. Acres of Sage-grouse Nesting/Late Brood Rearing and Winter Habitat within the Sage-grouse Analysis Area

Habitat Type	Acres	Inside Burn Area	Outside Burn Area
Nesting/Late Brood Rearing	393,175	170,190	222,985
Winter Habitat	250,009	90,084	159,925

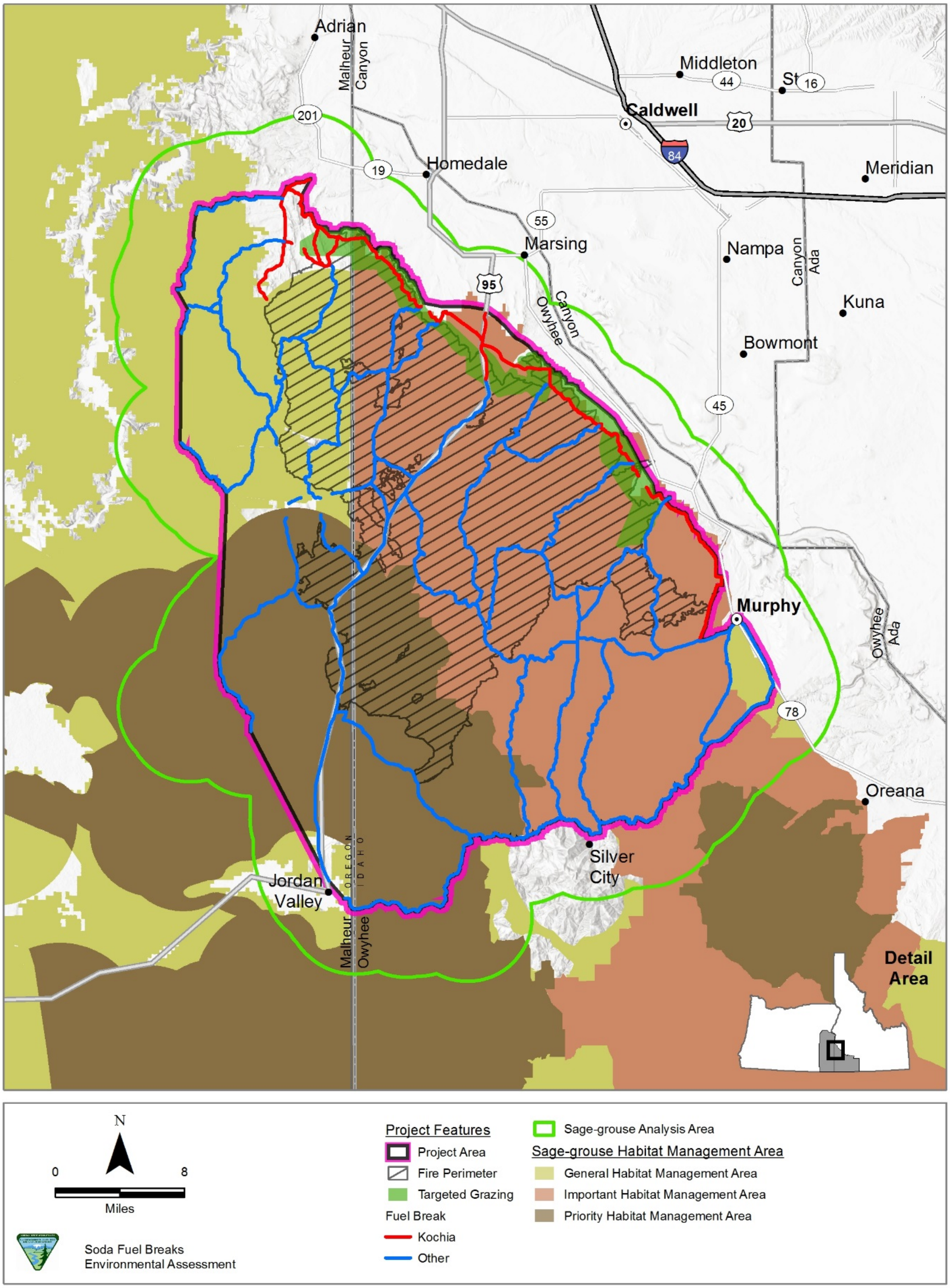

Figure 3.5-1: Sage-grouse Analysis Area and Sage-grouse Habitat Management Areas

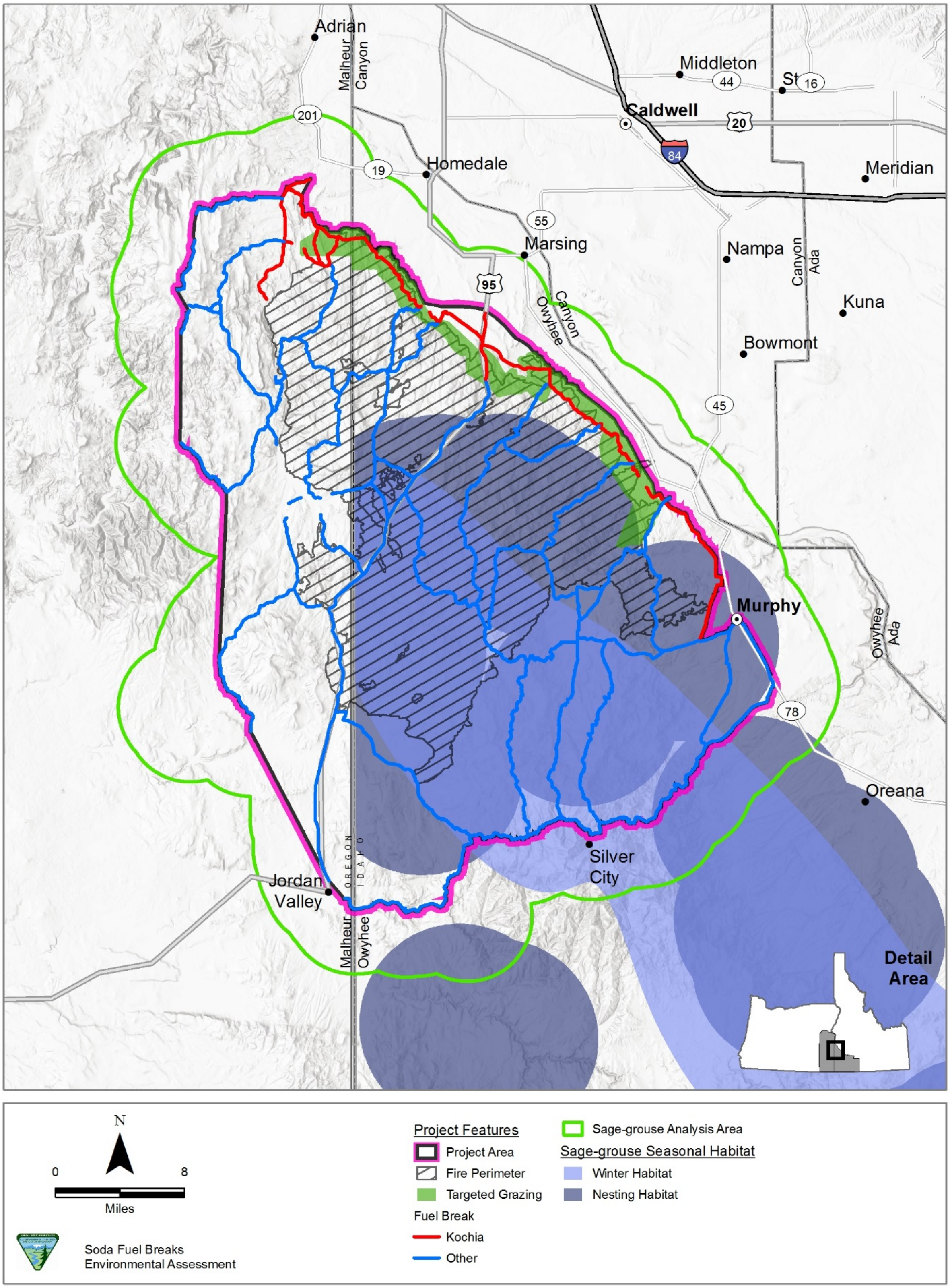

Figure 3.5-2: Sage-grouse Analysis Area and Sage-grouse Seasonal Habitat in Idaho

Within the sage-grouse analysis area, sage-grouse lek data from IDFG and ODFW identify 31 leks with a management status of occupied. The two states have different management definitions and terms to describe lek status; regardless, an additional 53 leks are identified within the analysis area that are either unoccupied, undetermined, or pending a management status declaration. Of the 31 occupied leks, 12 are within the Soda Fire burned area. Abandoned sage-grouse leks have been linked to increased nonnative annual grass presence and active leks have been associated with less annual grassland cover than the surrounding landscape (Knick et al. 2013). Wildfire and the significant loss of shrubland habitat within the burned area promotes the establishment of invasive annual grasses. The presence of annual grasses increases fire frequency. This nonnative annual grass and fire feedback loop can result in conversion from sagebrush shrublands to annual grasslands (Davies 2011), and ultimately to lek abandonment.

Columbia River Redband Trout

The analysis area for redband trout is the same as discussed for fish. Redband trout are an Idaho BLM Type 2 sensitive species and an Oregon BLM sensitive species. Under the focal species concept, analyzing impacts to redband trout streams can be can be assumed to be similar for other aquatic and riparian-dependent species.

Columbia River redband trout is a sub-species of rainbow trout and is the resident life form of steelhead trout. They are found in a wide range of stream habitats from desert areas in to forested mountain streams. Spawning occurs in the spring from February to June, depending on temperature and location (IDFG 2005). They eat mainly streamside and benthic (bottomdwelling) macroinvertebrates (USDI USFWS 2013b).

Similar to other species of trout, redband trout abundance is strongly correlated with riparian cover components, including undercut banks, large woody debris, and overhanging vegetation. Productive redband trout habitat is associated with higher gradient channels, often in riffles or with substrates dominated by boulders, cobbles, and pocket water. Redband trout also occupy pools in lower gradient streams that provide important holding and rearing habitat, resting places, over-wintering areas, and refuges from floods, drought, and extreme temperatures. Spawning habitat includes loose gravelly substrates to provide for oxygenation of eggs and embryos in redds in streams (USDI USFWS 2013b).

Approximately 195 of the 199 miles of creeks with fish presence within the fish analysis area are identified as redband trout habitat, of which approximately 73 miles are within the burned area. The Soda Fire has resulted in the temporary loss or reduction of suitable stream habitat for redband trout within the burn area. For all aquatic species, until enough vegetation recovery has occurred on the uplands and within the riparian habitat within the burned area, degradation will continue and these habitats may become unsuitable.

Columbia Spotted Frog

The Great Basin DPS of the Columbia spotted frog occurs in eastern Oregon, southwestern Idaho, and northern Nevada. The species is highly aquatic and is seldom found far from water. They are most often found in herbaceous wetland plant communities comprised of sedges, rushes and grasses, and use thick floating algae and riparian vegetation for cover (Tait & Vetter, 2008).

Frogs require well-oxygenated water for hibernation, and springs or saturated burrows are used as over-wintering sites.

Spotted frog population declines are attributed to habitat loss through conversion of wetlands to irrigated pastures, de-watering of rivers for irrigation uses, drying of ponds due to drought or overuse, and reduction of riparian habitat quality due to overgrazing (IDFG 2009). Improper grazing of the wetlands results in severely hummocked surface soils, broken-up the dense sod, which exposes mineral soil and leads to erosion potential and weed invasion. These disturbances lead to soil compaction, streambank sloughing, damage to vegetation, and premature drying of the soil surface (Engle & Munger 2003).

The analysis area for Columbia spotted frogs is the project area. Spotted frogs have been documented within the southern portion of the analysis area. Since 1996, a total of 53 Columbia spotted frogs observations have been recorded within the analysis area (IFWIS 2016). One of the observations occurred within the Soda Fire burned area. Table 3.5-7 lists the locations of the observations.

Table 3.5-7. Columbia Spotted Frog Observations within the Analysis Area.

Location	Number of Observations	Inside Burn Area
Split Rock Canyon, tributary to Trout Creek	2	No
Soda Creek	3	Yes (1 of 3)
Cow Creek	1	No
Impoundment at head of West Fork Reynolds Creek	1	No
Johnston Lakes	27	No
Man-made ponds, upper Succor Creek	19	No

3.5.2 Environmental Consequences – Wildlife Including Fish and Special Status Animal Species

3.5.2.1 Alternative 1 – No Action

With selection of this alternative, fuel breaks would not be constructed and the ability of wildland firefighters to effectively contain wildfires between travel routes would not be enhanced. Because there would be no changes to improve fire management in the project area, the analysis for this alternative addresses the effects of continued burning of habitat and spread of invasive annual vegetation.

Under the No Action alternative, large-scale fires are expected to continue to burn throughout the project area. A broad range of wildlife species may be injured or killed by large, fast-moving wildfires. Over the short- and long-term, this trend is expected to remove existing shrub cover, reduce perennial grass and forb cover, increase noxious weed and invasive plant cover, and impede establishment of shrubs seeded or planted following wildfire. It is not realistic to forecast the amount of habitat that could be lost to a wildfire, but wildfires are going to continue to occur within the project area and result in loss of shrub cover and increased likelihood of establishment of invasive annual grasslands. Loss of shrub cover would tend to reduce and/or fragment wildlife populations that favor or are dependent on shrub habitats for breeding, nesting, hiding, thermal cover, and foraging. This would shift wildlife assemblages towards increased abundance of grassland species. However, even those species that favor grassland habitats benefit from the presence of shrubs for browse and thermal cover during winter. The potential replacement of perennial grass and forb cover with noxious weeds or invasive plants may eventually reduce the habitat quality for grassland species by reducing the structural diversity of the cover as well as the biological diversity of plant and insect forage species.

Big Game

Under the No Action Alternative, big game species will be similarly affected. Cox (2008) provided data strongly suggesting habitat loss from fire and cheatgrass invasion was the primary cause of large reductions in mule deer populations in Nevada. While mule deer do forage on cheatgrass, it does not provide thermal or hiding cover. Recurring fire within and adjacent to the analysis area would continue to reduce suitable mule deer habitat (especially winter habitat) and remaining unburned mule deer habitat within the big game analysis area would be degraded by increased levels of use by mule deer. Effects of recurring fire would be similar for pronghorn and bighorn; however, these species are less dependent on shrublands for forage and cover than mule deer.

Fish

It is assumed under the No Action alternative that an increased frequency of wildfires would continue to remove streamside vegetation and indirectly impact fish species through increased water temperatures. Indirect impacts would also occur from increased sedimentation into fish-bearing streams due to the lack of soil stability and lack of water holding capability due to an absence of vegetation, especially shrub species.

Migratory Birds

Under the No Action Alternative migratory bird populations would modify their home ranges or seasonal use areas based on the habitat types available. Continued wildfire and loss of shrubland habitat would result in an increased abundance of grassland bird species within the migratory bird analysis area, especially those that can utilize disturbed areas and exotic herbaceous habitat types. Fire does present some opportunity for certain bird species to thrive, such as cavity nesters in recently burned conifer and hardwood forest habitat. However, repeated fire events across the shrub-steppe landscape generally leads to reduced habitat diversity resulting in reduced bird species diversity.

Golden Eagle

Continued loss of sagebrush habitat would negatively impact golden eagles, mainly because their preferred prey, black-tailed jackrabbits, would decrease. Sands et al. (2000) cites studies suggesting golden eagles in the SRBP have been adversely affected by changes in prey species abundance as a result of annual grassland expansion and corresponding loss of sagebrush cover. Black-tailed jackrabbit population declines are closely correlated with a loss of sagebrush cover, and current distribution is related to remaining habitat (Sands et al. 2000). Continuation of wildfires burning across the project area would negatively impact golden eagles. Other raptor species that utilize shrubland habitat, such as ferruginous hawk and red-tailed hawks, would be similarly affected.

Special Status Animals

Greater Sage-grouse

Conditions for this species would be expected to continue to degrade in the project area due to the presence and resulting spread of invasive annual grasses such as cheatgrass and medusahead, and increased fire frequency (Balch et al. 2013). Even in the remaining sage-grouse habitat outside of the Soda Fire burned area, another large wildfire would negatively impact sage-grouse for 25-120 years based on sagebrush species and growing conditions (Baker 2011). Cheatgrass-dominated grasslands without sagebrush represent an undesirable endpoint that remains stable because recurrent fires prevent re-establishment by sagebrush, native forbs and grasses (Knick and Hanser 2011). Without establishing fuel breaks, there is a greater likelihood of this species being extirpated in and adjacent to the project area. The successful recovery of sage-grouse habitat within the Soda Fire burned area would be unlikely.

Columbia River Redband Trout

The effects of the No Action alternative on redband trout would be the same as those described for fish. In general, continued loss of streamside vegetation and resulting increased water temperatures and sedimentation would have a negative impact on redband trout.

Columbia Spotted Frog

The effects of the No Action alternative on Columbia spotted frog would be similar to those described for redband trout. In general, continued loss of riparian and wetland vegetation and resulting increase in water temperatures and sedimentation would have a negative impact on potential habitat for Columbia spotted frog.

3.5.2.2 General Effects of Action Alternatives

By design, existing wildlife habitat within the footprint of the fuel breaks would be eliminated to develop the prescribed treatments by mowing, prescribed fire, hand cutting, chemical treatment, targeted grazing, or seeding new species such as prostrate kochia. Seeded species would replace existing native habitat to ensure fuel breaks consist of fire resilient species. Most existing bunchgrasses and forbs would not be expected to survive treatments involving high levels of soil disturbance or yearly maintenance (e.g., disking, targeted grazing, and herbicides). Herbicide treatments to control competition would target invasive annual grasses and forbs; however, perennial grasses and forbs may also become unintended targets. Repeated maintenance mowing over time may result in mortality of existing shrubland within the footprint of the fuel break, requiring seeding of plants that fit the fuel break vegetation criteria.

All of the vegetation treatment activities below that propose potentially disruptive mechanized equipment operation (tractors, chainsaws) would adhere to temporal and spatial restrictions identified in the RDFs for big game seasonal habitat, active raptor nests, and sage-grouse leks (Section 2.5.2). This would reduce or eliminate the effects of ground disturbing activities on these species.

Over the long-term, establishment of fuel breaks as specified in the Proposed Action is expected to reduce large-scale fire size, protect remaining sage-grouse habitat and important habitats of other native wildlife, and allow for the recovery of natural and seeded plant communities that mostly consist of shrub-steppe habitats. This would result in improved habitat for wildlife which require or favor shrub habitats for breeding, hiding, thermal cover, and foraging.

General effects on wildlife of each fuel break method are described below.

Mowing

Mowing would remove shrub branches and foliage higher than 6-12 inches within the treatment footprint. Removal of the shrub canopy would directly impact wildlife species by reducing available hiding and thermal cover as well as reducing forage availability to species such as mule deer and sage-grouse. Migratory birds that nest within or under shrubland habitat would lose nesting habitat. Mowing could result in mortality for less mobile wildlife species. Mowing would be repeated as shrub canopies regrow and exceed the 12 inch height. Repeat mowing of woody species can result in a decrease in plant vigor and increase in plant mortality, which would eventually eliminate the functionality of the habitat to wildlife species that utilize shrubland habitat.

Direct impacts of mowing on birds and pygmy rabbits would be reduced by the RDF that states: Mowing of sagebrush and disking would not occur from February 1 through July 31 to protect nesting migratory birds and pygmy rabbit natal burrows.

Human activity associated with mowing would impact wildlife species due to the visual and audible disturbance. While the response differs by species and among individuals, it is anticipated that human activity would cause temporary displacement or alter the activity level or behavior of some wildlife species. Several RDFs address avoiding disturbances to sensitive wildlife and habitats (including those for big game, raptor nests, and sage-grouse mentioned above), the applicable temporal and spatial restrictions associated with these RDFs would reduce anthropogenic disturbances to those species.

Opening the shrub canopy through mowing can result in an increase annual species (Davies et al. 2011). An indirect effect of mowing vegetation to create fuel breaks would include the potential for annual species, including noxious and invasive weeds, to spread from the fuel break into adjacent wildlife habitat. Spread of annual plant species, including noxious and invasive weeds, generally results in reduced or lost habitat function for most wildlife species.

Another indirect effect would include the increased capability to protect existing native wildlife habitat and current and future wildland fire vegetation rehabilitation and restoration investments, especially for small to medium intensity wildfires. Protecting native habitat and restoration investments would benefit wildlife by preserving habitat and allowing for an increase over time in native wildlife habitat abundance and functionality.

Prescribed Fire

Occasionally prescribed fire will be necessary to burn accumulations of weeds on fence lines or accumulated in topographical features such as draws or ditches associated with the proposed fuel breaks to maintain fuel break effectiveness. Wildlife species are likely to temporarily avoid human activity associated with prescribed fire; however, this activity is anticipated to be minimal and short in duration and have little effect on a majority of wildlife species. Prescribed fire objectives of the ARMPAs are met by establishing fuel breaks to protect ESR treatments that will promote the recovery of habitat and protect remaining habitat. There would be no risk to habitat as prescribed fire will be used to burn cut vegetation in place without further concentrating fuel loading by piling. This is accomplished when the surrounding vegetation has a high enough live fuel moisture content to prevent further spread of the fire, typically in the late fall/winter or spring). After prescribed burn, follow up treatments of herbicide application and/or seeding will prevent threats of invasive annuals.

Hand Cutting

The direct effect of hand cutting using chainsaws or loppers to create fuel breaks would be the reduction in density and canopy cover of shrubs within the treatment footprint. As with mowing, effects would include a reduction in available forage, hiding and thermal cover, and migratory bird nesting opportunity. Mortality of less mobile wildlife species would be unlikely with hand cutting. Shrubland habitat functionality in these areas would be reduced; however intact stands of shrubs would be maintained and the loss of function would be less severe than mowing. Visual and audible disturbance to wildlife associated with human activity during hand cutting would be similar to those described for mowing. The potential spread of annual plant species would have a similar effect on wildlife species as those described for mowing. The benefits associated with protecting habitat and restoration investments would be similar to mowing.

Chemical Treatment

Potential impacts of the chemical treatment to wildlife vary depending on type of herbicide and the duration and mechanism of exposure. Herbicide effects to wildlife are described in the *Vegetation Treatments using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* (BLM 2007a).

The PEIS states that risks from direct spray and spills, indirect contact with foliage after direct spray, and ingestion of contaminated food items after direct spray are generally low or non-existent for terrestrial fauna, with few exceptions, particularly for mammalian herbivores and pollinating insects. Birds, mammals, or insects consuming grass sprayed with herbicides have relatively greater risk for harm than animals foraging on other vegetative material, because herbicide residue is higher on grass (BLM 2007a). However, the PEIS states that harmful doses of herbicide are not likely unless the animal forages exclusively in the treatment area for an entire day.

While the level of risk is low, adverse effects to wildlife could occur; but reducing the negative impacts from non-native vegetation and noxious weeds would lead to improved conditions for wildlife across the landscape. The benefits of using herbicides outweigh the associated risks and the impacts from continued loss of habitat to wildfire and invasive vegetation. These general effects apply to all the wildlife species discussed below. Visual and audible disturbance to wildlife associated with human activity during chemical treatment would be similar to those described for mowing.

In addition, RDFs apply additional restrictions to herbicide applications specific to wildlife that would reduce potential exposure and associated effects on wildlife. This includes using herbicides with the lowest likelihood of impacting wildlife and application of harmful herbicides would not be applied at the maximum rate, not allowing broadcast spraying of 2,4-D within 300 meters of active pygmy rabbit burrows (only spot applications with 100 meters), no application of herbicides within 300 meters of active pygmy rabbit burrows from 1 hour before sunrise to 1 hour after sunrise, and no herbicide application within identified riparian/aquatic buffers.

Vegetated Fuel Break

Areas identified for vegetated fuel breaks (i.e., green strips) may or may not require seeding, mechanical seedbed preparation such as disking or chemical treatments to reduce competition prior to planting. Disking would be accomplished for the purpose of seedbed preparation using a rubber tired tractor or bulldozer or a series of disks to remove vegetation exposing bare mineral soil. Disking for seedbed preparation would be followed by seed application (and possibly herbicide treatment, then seeding). Vegetated fuel breaks will consist of either prostrate kochia, Sandberg's blue grass, bottlebrush squirreltail, or crested wheatgrass.

Over the long-term, the resulting forage kochia fuel breaks and herbaceous buffers are expected to be used by some wildlife for food and cover. Forage kochia provides a protein source (Waldron et al. 2010) and some species may utilize it for food. Documentation of wildlife use of forage kochia is mostly anecdotal; pronghorn antelope have often been observed feeding on a forage kochia fuel break near Mountain Home, Idaho. Observations in forage kochia seedings also indicate use by small mammals, likely ground squirrels or rabbits. Some wildlife are also expected to avoid the fuel breaks since the forage kochia is expected to outcompete other plant species within the seedings and eventually become a monoculture. Once that happens, diversity within the fuel break would be limited to species which might specifically utilize forage kochia either for food or cover.

Fuel breaks and buffer areas, once established, could provide adequate cover for some small mammals, reptiles, and ground-nesting birds such as horned larks. Other wildlife may use these areas only temporarily for feeding or travel. Some species may avoid treatment areas completely due to lack of appropriate cover or food. For purpose of this analysis, the fuel breaks are considered to be low- or non-functioning wildlife habitat.

Mechanized disturbances, such as disking, would not occur within sage-grouse nesting and winter habit during the appropriate seasons, or from February 1 through July 31 to protect nesting migratory bird and pygmy rabbit natal burrows. This would reduce impacts to sage-grouse, migratory birds, and pygmy rabbits as well as other species utilizing the same habitat at the same time.

Visual and audible disturbance to wildlife associated with human activity during vegetated fuel break preparation and maintenance would be similar to those described for mowing.

Targeted Grazing

Targeted grazing requires the use of livestock at a high intensity over a short duration to remove fine fuels. Targeted grazing may be implemented as a stand-alone treatment or in concert with other treatments such as green strips or crested wheatgrass seedings. Targeted grazing may require temporary facilities for implementation such as water haul sites, temporary fencing, and salt or mineral supplementation.

There is the potential for fences to create a collision hazard to wildlife, but most wildlife species can avoid the fences and either jump over or go under the fences. Temporary fences would not be constructed within 1.25 miles from occupied sage-grouse leks. Livestock class would be restricted to cattle to protect bighorn sheep from potential disease transmission. Livestock exclosure fencing in riparian areas would reduce potential impacts on fish and other aquatic species. Watering facilities would require bird ladders to reduce associated bird mortalities.

Livestock and big game species often compete for available rangeland forage. The targeted grazing proposed in the action alternatives is included with all the other fuel break methods, which are assumed to result in a reduction or loss of functional big game habitat.

3.5.2.3 Alternative 2 – Proposed Action

Proposed road improvement and maintenance under the Proposed Action would include using heavy equipment to blade or grade existing roadways, improvement and creation of ditches and shoulders, installing culverts, constructing rolling dip gravel stream crossings, road resurfacing, installing cattleguards, and sediment barriers, surfacing areas with gravel, and some roadways may need to be permanently re-routed to allow for access of suppression vehicles.

In general, road improvement and maintenance on public lands is likely to promote increased use by the public due to easier access. An increase in traffic volume on these roads would increase the potential spread of noxious weeds and other undesirable vegetation, increase the potential for human-caused wildfire, and increase the potential for negative interactions with wildlife including the temporary disturbance of wildlife as well as vehicle collisions with wildlife.

Big Game

Pronghorn Antelope

Many of the applicable impacts on pronghorn from implementation of the Proposed Action are addressed under Section 3.5.2.2. Specific impacts to pronghorn habitat within the big game analysis area is shown in Table 3.5-8.

Table 3.5-8. Pronghorn Habitat within the Proposed Action

Habitat Type	Inside Burned Area	Outside Burned Area	Total
Spring/Summer/Fall	2,799	2,017	**4,816**
Year-long	459	2,203	**2,662**
Winter	1,662	457	**2,118**
Total	**4,920**	**4,677**	**9,597**

The Proposed Action has the potential to disturb up to 9,597 acres of pronghorn habitat within the big game analysis area, approximately 4 percent of the total available pronghorn habitat within the big game analysis area. More than 50 percent of the pronghorn habitat proposed for disturbance under the Proposed Action burned in the Soda Fire, and is likely functioning at a reduced level. The Proposed Action would result in the disturbance of 9,597 acres of pronghorn habitat; however, this amount is relatively small compared to the available habitat within the big game analysis area and the effect of fuel break establishment over the long-term is expected to improve pronghorn habitat compared to the existing conditions.

Mule Deer

Many of the applicable impacts on mule deer from implementation of the Proposed Action are addressed under Section 3.5.2.2. Specific impacts to mule deer habitat within the big game analysis area is shown in Table 3.5-9.

Table 3.5-9. Mule Deer Habitat within the Proposed Action

Habitat Type	Inside Burned Area	Outside Burned Area	Total
Spring/Summer/Fall	1,348	3,362	**4,710**
Year-long	5,124	6,053	**11,177**
Winter	1,639	4,323	**5,962**
Total	**8,111**	**13,738**	**21,850**

The Proposed Action has the potential to disturb up to 21,850 acres of mule deer habitat within the big game analysis area, approximately 4 percent of the total available mule deer habitat within the big game analysis area. Approximately 40 percent of the mule deer habitat proposed for disturbance under the Proposed Action burned in the Soda Fire, and is likely functioning at a reduced level. The Proposed Action would result in the disturbance of 21,850 acres of mule deer habitat; however, this amount is relatively small compared to the available habitat within the big game analysis area and the effect of fuel break establishment over the long-term is expected to improve mule deer habitat compared to the existing conditions.

California Bighorn Sheep

Many of the applicable impacts on bighorn sheep from implementation of the Proposed Action are addressed under Section 3.5.2.2. Specific impacts to bighorn sheep habitat within the big game analysis area is shown in Table 3.5-10.

Table 3.5-10. Bighorn Sheep Habitat within the Proposed Action

Habitat Type	Inside Burned Area	Outside Burned Area	Total
Bighorn Distribution	4,685	4,159	**8,844**
Lambing Areas (Idaho only)	386	0	**386**

The Proposed Action has the potential to disturb up to 8,844 acres of bighorn sheep habitat within the big game analysis area, approximately 10 percent of the total available bighorn sheep habitat within the big game analysis area. More than half of the bighorn sheep habitat proposed for disturbance under the Proposed Action burned in the Soda Fire, and is likely functioning at a reduced level. The Proposed Action would result in the disturbance of 8,844 acres of bighorn sheep habitat; however, this amount is relatively small compared to the available habitat within the big game analysis area and the effect of fuel break establishment over the long-term is expected to improve bighorn sheep habitat compared to the existing conditions.

Fish

Impacts to water quality (Section 3.15) are applicable to the analysis of impacts to fish. While riparian and aquatic buffers will be implemented to avoid disturbing riparian vegetation during creation of fuel breaks, and BMPs and conservation practices will minimize sediment discharge into streams and wetlands, road maintenance under the Proposed Action will occur within riparian areas.

Within the fish analysis area, a total of 460 stream crossings would occur at perennial and intermittent streams; 200 occur within the burned area and 260 occur outside of the burned area. A total of 44 crossings occur at streams with identified fish presence (Table 3.5-11). Approximately half of those crossings are within the burned area where riparian vegetation was likely diminished and increased runoff and sedimentation from the fire are expected.

Table 3.5-11. Number of Road Crossings at Streams with Fish Presence by the Proposed Action

Stream Name	Crossings Inside Burned Area	Crossings Outside Burned Area	Total
Jordan Creek	-	2	**2**
Jump Creek	1	1	**2**
Macks Creek	-	1	**1**
McBride Creek	4	-	**4**
Reynolds Creek	-	3	**3**
Salmon Creek	8	-	**8**
Scotch Bob Creek	-	4	**4**
Sinker Creek	-	1	**1**
Soda Creek	1	2	**3**
Squaw Creek	8	-	**8**
Succor Creek	1	5	**6**
Trout Creek	-	1	**1**
Unnamed trib to Spring Creek	-	1	**1**
Total	**23**	**21**	**44**

Installation of culverts and construction of rolling dip gravel stream crossings would have the potential to result in temporary disturbance to streamside vegetation and increase sedimentation which would have a short-term impact on fish habitat through decreased water quality. However, road improvements to drainage design and ditches and improved stream crossings and culverts would improve water quality over the long-term.

Migratory Birds

Many of the applicable impacts on migratory birds are addressed under Section 3.5.2.2. Refer to the discussion of impacts on vegetation communities in Section 3.3.2.3 for detailed information regarding the vegetation communities disturbed under the Proposed Action. A vast majority of the proposed impacts on wildlife habitat would occur within shrubland habitat, with conifer forest, hardwood forest, exotic herbaceous, and riparian habitat also being disturbed. Additional loss of shrubland, forest, and riparian habitat would continue to push the migratory bird population towards an abundance of grassland bird species within the analysis area. However, the amount of habitat proposed for disturbance is relatively small compared to the amount of habitat available within the migratory bird analysis area and the effect of fuel break establishment over the long-term is expected to improve migratory bird habitat and species diversity compared to the existing conditions.

Golden Eagle

Of the 77 golden eagle nest locations identified within the golden eagle analysis area, 37 are within 0.5 mile of the Proposed Action. RDF's state that raptor nest surveys would be performed at the appropriate time of year prior to potentially disturbing activities, and that temporal and seasonal restrictions would be put in place around active nest on a case by case basis. Therefore, impacts on golden eagle breeding behavior and nest success are expected to be eliminated by implementation of RDFs.

Reduction in shrubland habitat associated with the Proposed Action as described under Migratory Birds would result in a reduction or loss of potential foraging habitat for golden eagles. However, the amount of shrublands disturbed under the proposed action is relatively small compared to the amount available and golden eagles can modify behavior and home ranges to deal with the loss of shrubland habitat if resources exist. Ultimately, the potential benefit that the fuel breaks provide in the restoration and maintenance effort of native plant communities, including shrublands, within the golden eagle analysis area outweighs the potential reduction or loss of habitat to create the fuel breaks.

Special Status Animals

Greater Sage-grouse

Within the sage-grouse analysis area, 29 of the 31 occupied sage-grouse leks are within 4 miles of the Proposed Action footprint. The level of anthropogenic disturbance within 3.1 miles of leks is negatively associated with lek persistence (Manier et. al. 2014). Approximately 7,000 acres of the of the Proposed Action footprint are within 4 miles of the occupied leks and are subject to the RDF that states: Treatments would not occur within 4 miles of an occupied and active lek from March 1 through July 31 to reduce the likelihood of impacts to sage-grouse reproduction including lek attendance, nesting, and early brood rearing. Given the timing restrictions and relatively low level of anthropogenic disturbance associated with the Proposed Action, it is unlikely that implementation of fuel breaks would have a negative effect on sage-grouse lek persistence.

Road improvement and maintenance would occur as part of the Proposed Action, and could result in an increase use of roads by the public. Increased traffic volume may reduce habitat effectiveness for sage-grouse beyond that associated with current traffic levels (ODFW 2012). Roads have been linked to reduced female grouse nest initiation (Lyon and Anderson 2003) and reduced male lek attendance (Holloran 2005). Road improvement and maintenance within the sage-grouse analysis area has the potential to have an indirect impact on sage-grouse by reducing habitat effectiveness of the adjacent PHMA, IHMA, and GHMA which would reduce the quality of available habitat for sage-grouse.

The Proposed Action has the potential to disturb up to 22,883 acres of sage-grouse habitat within the sage-grouse analysis area, approximately 3 percent of the total available sage-grouse habitat within the analysis area (Table 3.5-12). Approximately 40 percent of the sage-grouse habitat management areas proposed for disturbance under the Proposed Action burned in the Soda Fire, and are likely functioning at a reduced level. Seasonal habitat will be similarly affected (Table 3.5-13).

Table 3.5-12. Sage-Grouse Habitat Management Areas Disturbed by the Proposed Action

Habitat Management Area	Inside Burned Area	Outside Burned Area	Total
PHMA	658	3,449	**4,107**
IHMA	7,256	6,872	**14,128**
GHMA	1,425	3,223	**4,648**
Total	**9,339**	**13,544**	**22,883**

Table 3.5-13. Sage-Grouse Nesting/Late Brood Rearing Habitat and Winter Habitat Disturbed by the Proposed Action

Habitat Type	Inside Burned Area	Outside Burned Area	Total
Nesting/Late Brood Rearing	6,462	5,056	**11,518**
Winter Habitat	2,446	4,791	**7,237**

The Proposed Action is not anticipated to effect sage-grouse lek persistence and would result in the direct disturbance of 22,883 acres of sage-grouse habitat and have a potential indirect impact on habitat from increased traffic volume on improved roads; however, the potential impact on sage-grouse habitat amount is relatively small compared to the available habitat within the sage-grouse analysis area and the effect of fuel break establishment over the long-term is expected to improve sage-grouse habitat compared to the existing conditions.

Inland Redband Trout

Effects of the Proposed Action on redband trout would be the same as those described for fish. A total of 36 stream crossings occur within redband trout habitat (Table 3.5-14). Approximately 40 percent of the redband trout stream crossings are within the burned area.

Table 3.5-14. Number of Road Crossings at Redband Trout Streams

Stream Name	Crossings Inside Burned Area	Crossings Outside Burned Area	Total
Jordan Creek	-	2	**2**
Jump Creek	1	1	**2**
Macks Creek	-	1	**1**
McBride Creek	4	-	**4**
Reynolds Creek	-	3	**3**
Salmon Creek	8	-	**8**
Scotch Bob Creek	-	4	**4**
Sinker Creek	-	1	**1**
Soda Creek	1	2	**3**
Succor Creek	1	5	**6**
Trout Creek	-	1	**1**
Unnamed trib to Spring Creek	-	1	**1**
Total	**14**	**21**	**36**

Columbia Spotted Frog

Impacts to water quality as discussed in Section 3.15 and impacts to Fish would similarly impact potential habitat for spotted frog under the Proposed Action. Of the 53 observations of spotted frogs within the analysis area, two are within the Proposed Action footprint. This includes one of the Soda Creek observations and one of the man-made ponds along upper Succor Creek. Riparian and aquatic buffers will be implemented to avoid disturbing riparian vegetation during creation of fuel breaks which will minimize or eliminate impacts on spotted frogs at these two locations. BMPs and conservation practices will minimize sediment discharge into streams and wetlands; however, road maintenance under the Proposed Action will occur within riparian areas and has the potential to temporarily reduce water quality in those streams. Crossings at Soda Creek and Trout Creek occur above Columbia spotted frog observations and temporary impacts to water quality during improvement of those crossings could affect spotted frogs. However, improved drainage design and ditches and culverts would improve the water quality over the long-term, which would benefit spotted frogs.

3.5.2.4 Alternative 3 – Modified Proposed Action

General effects on wildlife from the Modified Proposed Action would be similar to those described for the Proposed Action. The Modified Proposed Action would disturb fewer acres of wildlife habitat than the Proposed Action, due to over 50 percent fewer acres of habitat disturbance. However, the decreased width of fuel breaks and lack of improvements along access roads under the Modified Proposed Action are likely to reduce the effectiveness of the fuel breaks and wildland firefighter response time.

Big Game

Pronghorn Antelope

Direct effects to pronghorn habitat within the big game analysis area would be less than half of what is expected under the Proposed Action (Table 3.5-15). However, recovery of burned pronghorn habitat and maintenance of existing habitat within the big game analysis would be more susceptible to future disturbance and loss through fire events than under the Proposed Action.

Table 3.5-15. Pronghorn Habitat within the Modified Proposed Action

Habitat Type	Inside Burned Area	Outside Burned Area	Total
Spring/Summer/Fall	1,216	867	**2,083**
Year-long	212	984	**1,196**
Winter	715	194	**909**
Total	**2,143**	**2,045**	**4,188**

Mule Deer

Direct effects to mule deer habitat within the big game analysis area would be less than half of what is expected under the Proposed Action (Table 3.5-16). However, recovery of burned mule deer habitat and maintenance of existing habitat within the big game analysis would be more susceptible to future disturbance and loss through fire events than under the Proposed Action.

Table 3.5-16. Mule Deer Habitat within the Modified Proposed Action

Habitat Type	Inside Burned Area	Outside Burned Area	Total
Spring/Summer/Fall	578	1,445	**2,023**
Year-long	2,599	2,879	**5,468**
Winter	752	1,962	**2,713**
Total	**3,929**	**6,286**	**10,204**

California Bighorn Sheep

Direct effects to bighorn sheep habitat within the big game analysis area would be less than half of what is expected under the Proposed Action (Table 3.5-17). However, recovery of burned bighorn sheep habitat and maintenance of existing habitat within the big game analysis would be more susceptible to future disturbance and loss through fire events than under the Proposed Action.

Table 3.5-17. Bighorn Sheep Habitat within the Modified Proposed Action

Habitat Type	Inside Burned Area	Outside Burned Area	Total
Year-long	756	143	**899**

Fish

The total number of crossings of intermittent and perennial streams would be the same as the Proposed Action. This would include 44 crossings of streams with fish presence, same as the Proposed Action. However, these roads are not proposed for maintenance and improvement under this alternative and would therefore have no additional impacts on streams and fish species above existing conditions other than an insignificant increase in use associated with implementation of the fuel break action.

Migratory Birds

Direct effects to migratory bird habitat within the migratory bird analysis area would be less than half of what is expected under the Proposed Action. However, recovery of burned habitat and maintenance of existing habitat within the analysis would be more susceptible to future disturbance and loss through fire events than under the Proposed Action. The Modified Proposed Action is less likely to maintain important shrubland, forest, and riparian habitat than the Proposed Action and therefore less likely to promote a diversity of migratory bird habitat.

Special Status Animals

Greater Sage-grouse

Direct effects to sage-grouse habitat within the sage-grouse analysis area would be less than half of what is expected under the Proposed Action (Table 3.5-18). Effects on nesting/late brood rearing habitat and winter habitat would also be less than half of what is expected under the Proposed Action. However, recovery of burned sage-grouse habitat and maintenance of existing habitat within the analysis would be more susceptible to future disturbance and loss through fire events than under the Proposed Action.

Table 3.5-18. Sage-Grouse Habitat Disturbed by the Modified Proposed Action.

Habitat Type	Inside Burned Area	Outside Burned Area	Total
PHMA	271	1,474	**1,745**
IHMA	3,507	3,155	**6,662**
GHMA	610	1,383	**1,993**
Total	**4,388**	**6,012**	**10,400**

Inland Redband Trout

Under the Modified Proposed Action there would be 36 crossings of redband trout streams, which is the same as the Proposed Action. However, these roads are not proposed for maintenance and improvement under this alternative and would therefore have no additional impacts on streams and fish species above existing conditions other than an insignificant increase in use associated with implementation of the fuel break action.

Columbia Spotted Frog

Impacts to water quality under the Modified Proposed Action as discussed in Section 3.15 and impacts to Fish would similarly impact potential habitat for spotted frogs. The same two spotted frog observations within the Proposed Action footprint are within the Modified Proposed Action footprint, potential impacts to those would be the same for both action alternatives. The lack of road improvements under the Modified Proposed Action would eliminate the potential effects on spotted frogs associated with these improvements under the Proposed Action.

3.5.3 Cumulative Effects – Wildlife Including Fish and Special Status Animal Species

The cumulative effects analysis area (CEAA) for wildlife is the same as each analysis area defined for each species. Current conditions of wildlife habitat in the CEAA are described in the Affected Environment (Section 3.5.1). Actions that could cumulatively affect wildlife habitat are construction and maintenance of the Gateway West Transmission Line project and Boardman to Hemingway Transmission Line project; vegetation treatments including post-fire treatments associated with the emergency stabilization and burned area rehabilitation plan (USDI BLM 2015a), and noxious weed management; ongoing livestock grazing; recreation; wildfire; and climate change.

Effects on wildlife habitat from the Gateway West Transmission Line project and Boardman to Hemingway Transmission Line project could include habitat modification, habitat removal, potential increase in noxious weeds, and reduced habitat functionality for some species (like sage-grouse) adjacent to the transmission line. However, conservation measures for sage-grouse are being analyzed through the project's NEPA review process, which should achieve a net conservation benefit for the sage-grouse (USDI BLM 2015f, USDI BLM 2015g). A net conservation benefit for sage-grouse is likely to result in a net conservation benefit for a vast majority of wildlife species within the CEAA.

Past and ongoing noxious weed treatments have, to some extent, reduced potential establishment and spread. However, noxious weeds continue to establish where not aggressively treated, particularly in the wake of large, frequent wildfires. Past, current, and future shrub restoration and noxious weed control treatments will be marginally successful without a reduction in fire size.

Ongoing livestock grazing may also contribute to cumulative effects on wildlife habitat. Grazing can reduce vegetation height and biomass which potentially competes with cover and forage requirements of wildlife species. Grazing could alter fuel loading within and adjacent to treatment areas, potentially reducing the rate of spread for fire or fire severity. However, grazing in the analysis area is mostly light to moderate and thus not expected to significantly compete with the forage and cover requirements of wildlife and not expected to contribute much to reducing fire at the current permitted level.

The effects of climate change on the analysis area are likely to be substantial; as the region becomes dryer and hotter, restoration of vegetated fuel breaks could become harder to establish and fires will likely become more prevalent. However, the proposed treatments should make the analysis area more resilient to fire, potentially mitigating the effects of climate change on wildlife habitat in the CEAA.

Under the No Action Alternative, the effects of past, present, and foreseeable actions in the CEAA are expected to continue current trends for wildlife habitat and species diversity. This means that wildlife habitat would continue to be converted to herbaceous plant communities and that fire would likely remove existing as well as recovering shrubland and forest habitat.

When past, present, and foreseeable future actions are added to either of the action alternatives (i.e., the Proposed Action or Modified Proposed Action), wildlife habitat within the analysis area are expected to gradually increase in species and structural diversity due to reduced fire size, with a greater degree of increased species and structural diversity expected associated with the Proposed Action.

3.6 Cultural and Paleontological Resources

Cultural resources are locations of human activity, occupation, or use. They include expressions of human culture and history in the physical environment, such as pre-contact or historic archaeological sites, buildings, structures, objects, districts, or other places. Cultural resources can also include natural features, plants, and animals that are considered to be important to a culture, subculture, or community or that allow the group to continue traditional lifeways and spiritual practices. This section provides an analysis of regulatory compliance related to cultural resources as well as a summary of cultural resource identification efforts completed to date for the Project, including anticipated impacts on cultural resources under NEPA.

Generally, cultural resources are considered to be “historic properties” under the NHPA if they are over 50 years old and meet the significance criteria for listing on the NRHP (36 CFR Part 60.4). However, there are considerations made for culturally significant resources less than 50 years old. Adverse effects to historic properties under the NHPA are typically considered significant impacts under NEPA, but may be mitigated to lessen the degree of significance.

For the purposes of this analysis, paleontological resources are also addressed in this section.

3.6.1 Affected Environment – Cultural and Paleontological Resources

The project area is within approximately 644,613 acres of lands in the Owyhee Mountains south of the Snake River and along the Oregon and Idaho state line. For the purposes of this analysis, the project area is considered the study area for cultural resources. The area of potential effect (APE) is limited to the surfaces and depths that would be affected by the Proposed or Modified Proposed actions. For the Proposed Action, the APE consists of 25,517 acres of fuel treatment and maintenance areas as well as the entirety of the targeted grazing area. For the Modified Proposed Action, the APE consists of 11,771 acres of treatment and maintenance areas as well as the entirety of the targeted grazing area. Under both alternatives, the APE extends to the maximum depth of disturbance (approximately 10 inches).

The study area is considered part of the Western Snake River Plain and is considered mountainous with gently rolling hills and incised drainage cuts. The Snake River corridor and its plain served as a travel corridor for both prehistoric and historic groups. This area is within the northern Great Basin Cultural region and straddles the ethnographic territories of the Northern Paiute and Northern Shoshone and Bannock. Pre-contact site types known in the region include sedentary villages, temporary or seasonal campsites, procurement localities, rock art, and burials.

Explorers and fur trappers began to explore southwestern Idaho in the early nineteenth century, often utilizing trails created by Native Americans. The first Euro-Americans known to have traveled overland through the Project region were members of the Pacific Fur Company, led by W.P. Hunt (Evans 1991:17). Hunt's route to Astoria followed the Snake River and then traversed the Blue Mountains and the Umatilla River to reach the Columbia River (Meinig 1968). Other expeditions soon followed, including trapping brigades led by Alexander Mackenzie, Peter Skene Ogden, and Nathaniel Wyeth. The first naturalists to record new flora and fauna from the interior of the Northwest, John Townsend and Thomas Nuttall, accompanied Wyeth on one of several trips he undertook through western Idaho and eastern Oregon (Evans 1991).

The influx of Euro-American settlers, combined with the arrival of the horse and firearms, led to conflicts across the Plains as cultural lands and hunting territories were encroached upon by mobile aboriginals and newly introduced trappers and traders (Murphy and Murphy 1986:302). It was Captain Benjamin Louis Eulalie de Bonneville who led the first wagons west over South Pass, Wyoming and continued on across the Snake River Plain into Oregon in 1832. The 1840s saw an increase in the number of people traveling along the Snake River Plain on their way to Oregon, largely due to the gold discoveries in California.

The main Oregon Trail and the "South Alternate" passed just north of the Project area. The principal route of migration westerly across southern Idaho to Oregon and California was via the Oregon Trail. The first wave of migration came during the 1830s as Protestant missionaries came west to convert the native populations (Hutchinson and Jones 1993). The first true emigrant wagon train arrived in southern Idaho in 1841, conducted by the Western Emigration Society and lead by Thomas Fitzpatrick. Shortly after the Fitzpatrick party, Captain John C. Frémont explored the region during his travels as part of a federal expedition and published accounts that became the trail guides for subsequent emigrants along the Oregon Trail (Hutchinson and Jones 1993). By the mid-1840s, the Oregon Trail was established as the preferred route for emigrants making their way west. Eventually more than 500,000 would-be settlers trudged over the Oregon Trail, accompanied by hundreds of thousands of animals. Portions of the Oregon Trail continued to be used into the late 1890s, but the trail saw a decline once the transcontinental railroad was completed in 1869, which provided faster, safer, and, usually, cheaper travel east and west.

By the late 1880s, Idaho was largely settled by emigrants from other parts of the West who sought their fortune in gold or land. In reality, many of them ended up making a living as farmers or storekeepers during the gold rush years and stayed on to raise livestock and crops. Few people were initially drawn to Idaho for its land, much of which, especially on the Snake River Plain, appeared sterile and uninviting (Schwantes 1991:96). Once the gold rush went bust, many emigrants stayed and learned that crops would grow well on the sage-covered flats of the Snake River Plain if water were available. The introduction of large-scale irrigation in the early 20th century soon made it possible to settle and farm this area (Schwantes 1991:96-97). By 1900, grazing, intensive agriculture, and timber production were the primary economic drivers in the region. Old mining ditches were put back to work to provide water for orchards, hayfields, row crops, and dairy cows (Braswell 1986). Opportunistic use of the old mining ditches faded as a more formal system of irrigation ditches developed. The ditch system devised by the early homesteaders in Owyhee and Malheur counties is still important to the area's agricultural base.

3.6.1.1 Identified Cultural and Paleontological Resources

In order to determine the potential for the alternatives to impact cultural and paleontological resources, BLM provided Tetra Tech with GIS data for previously recorded resources and surveys conducted within the study area. This data included the results of a recent survey conducted for drill seeding in the northern portion of the study area in Idaho and Oregon. Tetra Tech has supplemented BLM's data with the results of a recent survey conducted for a separate, unrelated project that passes through the study area. Data from the drill seed survey and Tetra Tech's recent survey are considered preliminary, but are included here for a better understanding of potential Project impacts. Tables 3.6-1 through 3.6-3 summarize the surveys conducted within the study area and APEs and the resources recorded there. The listed cultural resources surveys have covered 6.5 percent of the study area, 18.83 percent of the Proposed Action, and 23.40 percent of the Modified Proposed Action. A total of 885 resources have been identified in the study area, including 669 sites and 115 isolated finds. An additional 101 resources could not be determined to be sites or isolated finds based on the analyzed data. Of these study area resources, 140 resources (103 sites and 37 isolated finds) are within targeted grazing areas; 192 resources (144 sites, 20 isolated finds, and 28 unknowns) are within the APE of the Proposed Action; and 139 resources (108 sites, 12 isolated finds, and 19 unknowns) are within the APE of the Modified Proposed Action. A total of 23 paleontological localities are within the study area, one of which is within the APEs of the Proposed Action and Modified Proposed Action. One additional locality is within the targeted grazing areas. Paleontological resources often manifest on the ground's surface or in drainage cuts. It should be noted that due to the overlapping nature of much of the Proposed Action and Modified Proposed Action, many of the resources are considered to be within the APE of both actions.

3.6.1.2 Native American Consultations

In addition to the above resources, BLM is currently conducting government-to-government consultations with Indian tribes to identify traditional resources (such as traditional cultural properties) and other concerns tribes may have regarding the Project. BLM is consulting with three tribes: Northern Sho-Pai (Shoshone-Paiute), Fort McDermott, and Burns Paiute.

3.6.2 Environmental Consequences – Cultural and Paleontological Resources

This section addresses impacts on cultural and paleontological resources. Native American consultations regarding traditional cultural properties, sacred sites, and other tribal concerns are ongoing. Impact analysis focuses on the implementation of the alternatives described in Chapter 2. As cultural and paleontological resources are non-renewable resources, any direct impact is considered permanent.

BLM would consult with Tribes and SHPO regarding historic and cultural resources per Section 106 of the NHPA. Unevaluated or cultural resources with unresolved NRHP-eligibility statuses within the selected alternative's APE would be reviewed to determine whether they meet the criteria of eligibility for listing on the NRHP. If impacts on NRHP-eligible resources within the selected alternative's APE cannot be sufficiently avoided, consultation would be required to determine appropriate mitigation.

Potential impacts on cultural resources could occur if an alternative were to have an adverse effect on historic properties under Section 106 of the NHPA (36 CFR 800). Impacts on non-historic properties may also occur under NEPA. Tables 3.6-1 through 3.6-3 show the number of previous surveys covering the APE of each alternative and the cultural and paleontological resources recorded in each.

3.6.2.1 Alternative 1 – No Action

Under the No Action Alternative, a fuel breaks network would not be created. Therefore, impacts on cultural and paleontological resources would not occur as a result of fuel break construction (i.e. ground disturbance). However, the Project area would remain increasingly subject to future fire incidents, which may result in further damage to or destruction of cultural and paleontological resources from high heat. All NRHP-eligible, unevaluated, and unidentified cultural resources within the Project area will continue to be threatened by this potential as well as wildfire suppression activities, such as bulldozer lines, that may occur during the incident.

3.6.2.2 General Effects of Action Alternatives

Impacts on cultural resources may occur as a result of design features common to all alternatives. However, the cultural resource design features would limit the majority of these impacts to less than significant. Further, any fuel break treatments occurring within an archeological site would be pre-approved in consultation with the applicable SHPO and local tribes. Any cultural resource inventories, such as those in recommended mitigation measures, would be conducted in accordance with the applicable State Protocol Agreement.

Mowing

Mowing vegetation to a height of no less than 10 inches utilizing a rubber-tired vehicle and in accordance with the cultural resources design features will avoid impacting known cultural resources, provided there are no features taller than 10 inches or artifacts that are above the 10 inches in height. In areas where survey for cultural resources has not been conducted, mowing to a height less than 10 inches and not in accordance with the cultural resources design features may result in significant impacts to unidentified cultural resources. Further, preliminary consultations with tribes in Idaho have suggested that having differing mowing heights between cultural resource sites and other treated areas may draw attention to the cultural resource areas and potentially lead to increased looting. These potentially significant impacts may be reduced to less than significant through implementation of Mitigation Measures CR-1 and CR-2.

Mitigation Measure CR-1: Treatment areas that have not been previously surveyed for cultural resources will be surveyed by qualified and Professional Archaeologists prior to treatment. Newly identified cultural resources will be assessed for NRHP-eligibility and coordination with the applicable state SHPO. Those resources identified as NRHP-eligible or cannot be satisfactorily evaluated in accordance with the treatment schedule will be avoided or treated in accordance with the cultural resource design features, whichever is recommended and agreed upon through consultation by the BLM, SHPO, and Tribes.

Mitigation Measure CR-2: To reduce the potential for looting of cultural resource sites, mowing heights will be gradually increased/decreased around the site boundary so as to avoid abrupt changes in vegetation height.

Mowing of surface vegetation may impact paleontological resources, however any treatments within a paleontological site will adhere to design features similar to those designed to protect cultural resources sites. Therefore, no significant impact on paleontological resources from mowing are anticipated.

Prescribed Fire

Prescribed fire will be used along fence lines or topographical features where weeds accumulate in density. Many of the cultural resources in the study area and APE have been previously burned under severe wildfire conditions. In most cases prescribed fire will have little to no impact on any site if allowed to burn across the site. Any combustible materials that were present have likely been consumed; other non-combustible materials that reflect a site's importance remain.

Survey for cultural resources in previously un-surveyed portions of prescribed fire treatment areas will be impeded, if not prevented, by the dense vegetation. However, since burning will be done when live fuel moisture levels are high enough to retard fire beyond the weed concentrations and no ground disturbing activities, such as a disking, will be conducted, no impact on unidentified cultural resources is anticipated as a result of prescribed fire treatments. Surveys will be conducted prior to burning in areas where previous surveys have not been conducted, but are possible.

Burning vegetation in areas with paleontological resources will be considered on a site-by-site basis. Research has shown that fossil specimens that come into contact with burning fuel will discolor and fracture depending on the intensity of the fire (Benton and Reardon 2006). In addition to the direct effects the reduction of vegetation on a paleontological site may indirectly result in unauthorized collection of fossils.

Hand Cutting

Hand cutting of trees or shrubs with chainsaws or loppers may result in significant impacts where such vegetation is considered a component of a cultural resource. However, under the cultural resource design features, tree and shrub cutting within sites will be determined on a site by site basis. Further, pile burning of large amounts of residual debris would not be allowed within unevaluated or NRHP-eligible or –listed properties under the cultural resource design features. Therefore, no impacts on identified cultural resources are anticipated. However, impacts may occur on unrecorded cultural resources where hand cutting occurs within previously un-surveyed portions of the APE. Implementation of Mitigation Measure CR-1 above would reduce these potential impacts to less than significant.

Hand cutting vegetation is not anticipated to impact paleontological resources, however, pile burning could have a direct significant effect on surface-exposed resources; therefore cut trees and shrubs will not be piled where visible surface fossils are present.

Chemical Treatment

Application of herbicides may impact cultural resources if the application vehicle is driven through the resource, if the herbicide is applied to rock art, or if herbicide is applied within a

Native American plant gathering area. However, under the cultural resource design criteria, herbicides would only be applied on NRHP-listed or -eligible sites through the use of hand sprayers. UTV/ATV-mounted sprayers may also be used when soils are not wet or saturated to avoid disturbance of soils. Herbicides would not be applied where it would affect rock art images or within traditional Native American plant gathering areas (as identified through consultation with affected tribes). Therefore, chemical treatments are not anticipated to impact known cultural resources. However, impacts may occur on unrecorded cultural resources where chemical treatments would occur within previously un-surveyed portions of the APE. Implementation of Mitigation Measure CR-1 above would reduce these potential impacts to less than significant.

Where re-vegetation is necessary, seeding design features and recommended mitigation measures discussed below under Vegetated Fuel Breaks would be implemented. Therefore, significant impacts on cultural resources as a result of re-vegetation treatments post-chemical treatment application are not anticipated.

Chemical treatment of vegetation is not anticipated to directly impact paleontological resources; however, the use of heavy equipment on a fossil site could result in fossil breakage and movement. Additionally indirect effects may occur as a result of exposure from reduced vegetation cover leading to unauthorized collection of fossils. Design criteria regarding use of motorized vehicles on a cultural resource site will be applied to paleontological sites to avoid such impacts.

Vegetated Fuel Break

Areas identified for vegetated fuel breaks (i.e., green strips) may or may not require seeding, mechanical seedbed preparation such as disking or chemical treatments to reduce competition prior to planting. Chemical treatments associated with vegetated fuel breaks are anticipated to have the same impact as described above for chemical treatments. As described below, most impacts from the various vegetated fuel break treatments are expected to be less than significant with implementation of the cultural resource design features. However, these design features apply only to previously identified resources. Impacts may still occur on unrecorded cultural resources in un-surveyed areas. These potentially significant impacts may be reduced to less than significant with implementation of Mitigation Measure CR-1, described above.

Due to the heavy ground disturbing nature of disking, the potential for disturbance to cultural resources from such activities is considered high. Disking through a site would impact the site's vertical and horizontal spatial integrity through churning soil up to 9" deep. Disking can destroy features, break artifacts, and either cover or uncover artifacts by soil movement. Post disking there is the potential for soil erosion where silty or loose soils are prevalent. Additionally, linear features would also be heavily impacted by disking through flattening of feature berms and in general minimizing a linear site's features. With implementation of cultural resource design features the potential for significant impacts would be reduced to less than significant. These features disallow disking within the boundaries of any NRHP-listed, -eligible, or unevaluated cultural resource within the APE.

Drill or broadcast seeding would be utilized to establish a fuel break consisting of desirable perennial vegetation where natural recovery is unlikely. Rangeland drills or no-till drills would be utilized, depending on soils and topography. Rangeland drills result in disturbance between 1 and 6 inches in depth. A no-till drill would also result in disturbance, but to a lesser depth. Such disturbances within a NRHP-eligible, -listed, or unevaluated cultural resource would result in significant impacts. With implementation of the cultural resource design features, these impacts are anticipated to be reduced to less than significant. Seeding in NRHP-listed or –eligible sites would be accomplished through hand seeders or UTV/ATV mounted seeders. Seeding using a standard rangeland or minimum till drill would be allowed within a site and a case-by-case basis, depending on the resource present, soil conditions, and drill type proposed. Seeding vehicles would be pulled by a rubber-tired tractor when soils are not wet or saturated to minimize disturbance. Additionally, drills would be equipped with depth bands to minimize the depth of disturbance as appropriate.

Broadcast seeding, followed by a cover treatment, would be utilized where the terrain is not conducive to drill seeding. Cover treatments would utilize a harrow, cultipacker, or roller packer implement when possible. Use of a harrow would have similar impacts to those described for no-till drills. Use of harrows, culti-packers or roller packers present less potential for ground disturbance than under use of a drill seeder; however the potential for impacts is still present. The primary disturbance from the culti-packer and roller packer would occur from the vehicle. Under the cultural resource design features, the use of a rubber-tired culti-packer within any cultural resource would be determined on a site-by-site basis in consultation with SHPO. Soils would be required to be firm and the vehicle would not turn within the site. Use of a harrow, on the other hand, would likely result in dragging and displacement of artifacts, a significant impact within NRHP-eligible, -listed, or unevaluated cultural resources. These potentially significant impacts may be reduced to less than significant through implementation of Mitigation Measure CR-3.

Mitigation Measure CR-3: Harrows will not be utilized for cover treatment within an NRHP-eligible, -listed, or unevaluated cultural resource site. Use of a harrow will be allowed on a case-by-case basis within NRHP-ineligible sites.

Four species of plants, two native and two non-native, have been identified for use within the APEs: Prostrate kochia, Sandberg bluegrass, Bottlebrush squirreltail, and Crested wheatgrass. Although native vegetation is the preferred species, particularly within cultural resource sites and Native American plant gathering areas, the use of any of the species of plant proposed is acceptable provided the seeds are dispersed according to the methods described above. Many of the archaeological sites that have burned over in the past are now covered by highly combustible annual plants that increase the fire return interval. The growth characteristics of the proposed plant seedings will be effective in reducing the spread of wildlife and decreasing the intensity and size of fire burning across a resource. Therefore, the potential for future significant impacts on cultural resources as a result of fire and wildfire suppression activities would be decreased.

Ground disturbing activities associated with vegetated fuel breaks may have significant impacts on paleontological sites through breakage of fossils, exposing buried fossils and movement of fossils. Appropriate treatment types will be determined on a site-by-site basis to minimize adverse impacts.

Targeted Grazing

Targeted livestock grazing will require the use of cattle at high intensity levels over short durations. Temporary fencing, watering sites, and salt or mineral stations may be required.

Impacts on cultural resources may occur as a result of trampling, particularly when cattle are concentrated in one area due to salt and mineral stations. Trampling may result in churning of site soils, disturbance of cultural features and artifacts, breakage of artifacts, soil erosion, and looting of artifacts that become more visible. However, clearances would occur prior to treatment implementation for specialists to determine avoidance areas and protect resources. Additionally, the installation of temporary fencing and watering sites may also result in significant impacts on cultural resources through disturbance of cultural resources. Salt or mineral stations would likely concentrate the effects of trampling described above. Targeted grazing may also occur when soils are wet or saturated during the early spring, which would result in significant adverse impacts to cultural resources through trampling and vertical movement of artifacts.

Thirty-seven isolated finds and 103 sites are within the area proposed for targeted grazing under both the Proposed and Modified Proposed actions. Thirty-two of the isolated finds are not eligible for listing on the NRHP, while five are unevaluated. One of the sites is NRHP-listed, 10 are NRHP-eligible, 45 are NRHP-ineligible, 46 are unevaluated, and one is of unknown NRHP status. The listed resource is the Poison Creek Stage Station (10OE3609). Table 3.6-1 summarizes the NRHP-eligibility of the resources within the targeted grazing area. Twenty-one of these are also within the fuel break areas under both action alternatives, including five isolated finds in Idaho (all NRHP-ineligible), 13 sites in Idaho (four NRHP-eligible, seven NRHP-ineligible, and two unevaluated), and three sites in Oregon (one NRHP-eligible and two unevaluated).

Table 3.6-1. Summary of NRHP-Eligibility of Cultural Resources within Targeted Grazing Areas Common to Both Action Alternatives

Resource Type	NRHP Eligibility	Idaho	Oregon	Total
Isolated Find	Not Eligible	26	6	32
	Unevaluated	5	0	5
Site	Listed	1	0	1
	Eligible	8	2	10
	Not Eligible	44	1	45
	Unevaluated	43	3	46
	Unknown	0	1	1
	Total:	***127***	***13***	***140***

The cultural resource design features for the Project reduce the potential for impacts on cultural resources from targeted grazing by requiring surveys of grazing areas utilizing site probability models to direct surveys to focus on areas with increased potential for NRHP-eligible sites. Temporary fencing to avoid targeted grazing within archaeological sites would be determined on a case-by-case basis. Additionally, surveys will be conducted prior to the installation of temporary fences, water troughs, and or salt blocks. With implementation of these design features, impacts on cultural resources as a result of targeted grazing are expected to be less than significant.

Activities associated with targeted grazing may result in impacts on paleontological resources. Concentrations of cattle on surface fossil resources may directly result in fossil breakage, and exposing or burying of fossils if soils are wet or saturated. A significant reduction in vegetative cover may also expose fossils to unauthorized collection.

Maintenance

Maintenance of fuel breaks over the life of the project would consist of mowing, hand cutting shrubs from the fuel break, application of herbicides, and targeted grazing. Impacts on cultural resources as a result of these maintenance activities would be the same as those described above. Cultural resource design features require that installation of culverts, cattle guards, or other road maintenance treatment that goes beyond the current road prism or previously disturbed areas be surveyed prior to construction activities. Any roads requiring re-routing would also be surveyed for cultural resources prior to construction. With these design features, road maintenance activities are expected to have less than significant impacts on cultural resources.

Impacts on paleontological resources as a result of fuel break maintenance activities such as mowing, hand cutting, and herbicide applications would be similar to those described above. Road maintenance may impact paleontological resources when roads are widened or bladed, or when features such as culverts are installed. Direct impacts would include fossil breakage, digging up intact fossil resources, horizontal and vertical movement of fossils and exposure of fossils. Indirect impacts may include unauthorized collection from increased exposure.

Livestock Grazing Management

Livestock grazing management activities may include temporary fencing, herding, avoidance by trailing, shutting off water sources, and removing salt or mineral sources in order to protect seeded areas from cattle. Impacts on cultural and paleontological resources would be the same as described for targeted grazing.

3.6.2.3 Alternative 2 – Proposed Action

Table 3.6-2 summarizes the NRHP-eligibility of the 192 resources within the APE of the Proposed Action. Twenty-one of these are also within the targeted grazing area that is common to both action alternatives. This includes five isolated finds in Idaho (all NRHP-ineligible), 13 sites in Idaho (four NRHP-eligible, seven NRHP-ineligible, and two unevaluated), and three sites in Oregon (one NRHP-eligible and two unevaluated). The Proposed Action APE has been 18.83 percent surveyed for cultural resources. Additional resources may exist within the Proposed Action's APE in areas that have not been previously surveyed or in areas that were surveyed with poor ground surface visibility.

Table 3.6-2. Summary of NRHP-Eligibility of Cultural Resources within APE of Proposed Action

Resource Type	NRHP Eligibility	Idaho	Oregon	Total
Isolated Find	Not Eligible	15	1	16
	Unevaluated	4	0	4
Site	Eligible	43	1	44
	Not Eligible	53	1	54
	Unevaluated	37	3	40
	Unknown	5	1	6
Unknown	Unevaluated	4	0	4
	Unknown	0	24	24
	Total:	***161***	***31***	***192***

Impacts from treatments and maintenance, as described above in Section 3.6.2.2, on these resources and unrecorded sites would be considered significant. Compared to the Modified Proposed Action, the potential for significant impacts on cultural resources is greater under the Proposed Action, given the increased area of disturbance, inclusion of road maintenance, and the increased number of potential historic properties (NRHP-eligible, unevaluated, or unknown NRHP status). However, with the implementation of cultural resource design features and the mitigation measures described above, these impacts will be reduced to less than significant, meaning that the properties that render a site eligible for listing on the NRHP will not be adversely affected.

Paleontological locality #264 (Reynolds Creek Area) is within the APE of the Proposed Action. Mitigation measures will be applied to this locality, as appropriate, to protect the values that make this site significant.

3.6.2.4 Alternative 3 – Modified Proposed Action

Table 3.6-3 summarizes the NRHP-eligibility of the 139 resources within the APE of the Modified Proposed Action. The same resources described under the Proposed Action are also within the targeted grazing area within the Modified Proposed Action. The Modified Proposed Action APE has been 23.40 percent surveyed for cultural resources. Additional resources may exist within the Proposed Action's APE in areas that have not been previously surveyed or in areas that were surveyed with poor ground surface visibility.

Table 3.6-3. Summary of NRHP-Eligibility of Cultural Resources within APE of Modified Proposed Action Alternative 3

Resource Type	NRHP Eligibility	Idaho	Oregon	Total
Isolated Find	Not Eligible	11	1	12
Site	Eligible	33	1	34
	Not Eligible	39	0	39
	Unevaluated	27	2	29
	Unknown	5	1	6
Unknown	Unevaluated	2	0	2
	Unknown	0	17	17
Total:		***117***	***22***	***139***

Impacts from treatments and maintenance would be similar to those described for the Proposed Action. However, the Modified Proposed Action has less potential for significant impacts due to the smaller disturbance area, greater previous survey coverage, and fewer potential historic properties. With the implementation of cultural resource design features and the mitigation measures described above, impacts will be reduced to less than significant.

Impacts on paleontological resources would be the same as described under the Proposed Action.

3.6.3 Cumulative Effects – Cultural and Paleontological Resources

To determine which other actions should be included in a cumulative impacts analysis, the regions of influence must first be defined. For cultural resources, these regions should not be limited to only the geographic areas of resources addressed by the alternatives, but they should also take into account the distances that cumulative impacts may travel and the regional characteristics of cultural resources and historic landscapes. Since this EA addresses fuel breaks within a burn area in the Owyhee Mountains adjacent to the Snake River Plain of southwestern Idaho, and is within an area of unique prehistoric patterns and early historic western expansion, the region of influence for cultural resources in evaluating cumulative impacts is considered to be primarily in the Owyhee Mountains, but also secondarily considers the Snake River Plain.

The timeframe of the cumulative impact analysis for cultural resources incorporates the sum of the effects of past, present, and future actions combined with the anticipated effects of the proposed alternatives.

This analysis considers past, present, and future actions consistent with the proposed alternatives analyzed in this EA. Cumulative impacts were determined by 1) determining the above geographic and temporal extent of analysis; 2) determining what past, present, and reasonably foreseeable actions and trends are likely to affect cultural resources and their impacts; 3) considering the baseline conditions of cultural resources described in Section 3.6.1 and the anticipated impacts on those resources, as described in Section 3.6.2; and 4) considering the incremental contribution of each alternative's impact to the overall regional and temporal pattern of impacts on cultural resources.

Those past, present, and reasonably foreseeable projects and trends in the cumulative analysis area considered likely to contribute to the cumulative impact on cultural resources are listed below:

- Gateway West Transmission Line
- Boardman to Hemingway Transmission Line
- Soda Fire ESR Plan
- Recreation
- Livestock Grazing
- Weed treatment
- Wildfires

Both of the Gateway West and Boardman to Hemingway transmission line projects would introduce modern elements to a generally rural landscape that closely portrays the prehistoric and historic settings of the Owyhee Mountains and Snake River Plain. Additionally, the construction of towers and access roads will have significant impacts on cultural resources, which would be mitigated to less than significant, when possible, under Historic Property Treatment or Management plans developed for those projects.

The Soda Fire ESR Plan identifies resources impacted by the Soda Fire and within the burned area of the Project and describes protective measures for those resources. Due to mitigation measures no sites will be adversely impacted from the Soda Fire ESR work.

Recreation and livestock grazing impacts cultural resources through ground disturbance and potential looting and vandalism. These activities are managed in the Project area and surrounding public lands by BLM RMPs that incorporate measures to reduce impacts on cultural resources to less than significant.

Weed treatments have effects similar to those described above for mowing, prescribed fire, hand cutting, chemical treatments, and targeted grazing. Similar to recreation and livestock grazing cumulative projects, these activities are presumably managed by RMPs that reduce impacts on cultural resources to less than significant.

Wildfires impact cultural resources through destruction of combustible artifacts and features. In addition non-combustible artifacts may be affected when temperatures are hot enough. Wildfire suppression tactics primarily impact cultural resources though ground disturbance (i.e. dozer and hand lines). The construction of fuel breaks along roads may help reduce the amount of dozer lines constructed during a wildfire event, thus impacting fewer unknown sites.

Both Project alternatives are anticipated to impact cultural resources that would minimally contribute to the cumulative removal, destruction, and general loss of intact representations of the region’s prehistory and history. However, with the proposed cultural resource design features and mitigation measures presented in Chapter 2 and above, respectively, these impacts are anticipated to be limited to less than significant. Therefore, the Project is not anticipated to have significant cumulative impacts requiring additional mitigation.

3.7 Visual Resource Management

3.7.1 Affected Environment – Visual Resource Management

The analysis area for visual resource management is the proposed project area because project impacts would not extend beyond this boundary. The 1999 Owyhee RMP (USDI BLM 1999) directed that visual or scenic values of BLM lands be considered whenever any physical actions are proposed and designated the spatial extent of four Visual Resource Management (VRM) Classes [Southeastern Oregon RMP & ROD (2002) p. 64]. BLM Manual H-8410-1 (Visual Resource Inventory) describes Visual Resource Class objectives are as follows:

Class I – The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention. There are 609 acres designated as VRM Management Class I in the proposed project area.

Class II – The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract 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. There are 76,235 acres designated as VRM Management Class II in the proposed project area.

Class III – The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. There are 125,801 acres designated as VRM Management Class III in the proposed project area.

Class IV – The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements. There are 406,770 acres designated as VRM Management Class IV in the proposed project area.

Most of the fuel break segments occur in areas classified as VRM Management Class IV. However, some portions of segments occur in areas with more restrictive VRM classifications. Acreage figures are for public lands administered by BLM only, as VRM is not classified for military, State of Idaho, or private lands.

3.7.2 Environmental Consequences – Visual Resource Management

3.7.2.1 Alternative 1 – No Action

Under the No Action alternative no short- or long-term change to visual resources would occur due to treatment implementation. The impacts of not doing the treatments would create other short- and long-term impacts. Potential impacts to visual resources due to fire and associated fire suppression and post-fire Soda Fire ESR Plan activities are expected to occur, including blackened vegetation and soil, dozer lines, red coloration from retardant drops, and soil surface disturbance due to post-fire seeding. Some visual impacts to vegetation and soils would be short-term and would be reduced or disappear following recovery of on-site vegetation or seeding establishment. The visual impacts of dozer lines can be long-term, even if these areas are seeded, and can last for several decades post-fire or until vegetation obliterates the disturbance. Retardant drops result in short-term visual impacts that last until weathering or vegetation growth are adequate to eliminate the red coloration. Contrast would occur where recovering or seeded vegetation is different than surrounding; for example, where surrounding vegetation is shrub-dominated and post-fire vegetation is dominated by herbaceous plants. In this case, visual impacts would be long-term and would last for about 10 to 15 years or until shrub establishment is adequate to blend with the surrounding vegetation.

3.7.2.2 Alternative 2 – Proposed Action

Implementation of the Proposed Action would result in short- and long-term impacts to visual resources (Table 3.7-1). Short-term impacts would consist of linear areas of visual contrast adjacent to travel routes resulting from vegetation removal, mechanical treatments, road and ditch maintenance, and biological thinning. Visual contrast would be more pronounced in the burned area, as the contrast would be seen from a longer distance and would not be broken up by vegetation as it would in the unburned area. The visual contrast resulting from this disturbance would be greatest during the period from treatment through seeding establishment.

Table 3.7-1. VRM Management Class Crossed by Proposed Action

VRM Management Class	Acres Crossed by Proposed Action
Class I	7
Class II	3,496
Class III	6,392
Class IV	14,499

In the proposed project area, road and ditch maintenance along which fuel breaks would be established provide the greatest degree of contrast over the long-term. The long-term visual contrast following treatment establishment would be weak to moderate in most areas. The primary contrast in these areas would be created by the 200 foot-wide vegetated strips on one or both sides of the road, which would have a slightly different color and texture compared to the adjacent area. This contrast would be most obvious in late summer and fall, in the prostrate kochia fuel breaks when the kochia is red and the surrounding vegetation is tan or gold in color. The remainder of the year the color would be green to brown and the contrast weak. Following seeding establishment, the greatest level of contrast would result along segments where fuel breaks are adjacent to sagebrush stands. This would be due to differences in vegetation height (about 2 to 3 feet tall for sagebrush versus about 1 foot tall for fuel break vegetation) and slight differences in vegetation color, which would be most obvious in late summer/fall.

Areas managed within VRM Classes I and II are along existing roads. In addition, topography in these areas limit the visual extent in these Class I and II areas. Over the long-term, the level of contrast resulting from fuel break establishment would be consistent with objectives for VRM Classes III and IV, which comprise most of the proposed project area and fuel break segments. Implementation of the Proposed Action with design features to reduce visual impacts, such as not establishing vegetation in rows, would not likely result in long-term visual contrast that is different from the current condition.

3.7.2.3 Alternative 3 – Modified Proposed Action

Short- and long-term visual impacts from the fuel breaks would be similar to those described for the Proposed Action. However, contrast would be much lower than the Proposed Action because it would not include road and ditch maintenance and the fuel breaks would be half the width and would cover a smaller geographic area (Table 3.7-2).

Table 3.7-2. VRM Management Class Crossed by Modified Proposed Action

VRM Management Class	Acres Crossed by Proposed Action
Class I	1
Class II	1,524
Class III	2,911
Class IV	6,853

3.7.3 Cumulative Effects – Visual Resource Management

Impacts associated with the Proposed Action and alternatives are consistent with contrast levels allowed for VRM Classes III and IV, which comprise the majority of the proposed project area. Project design features and existing landscape characteristics in areas classified as VRM Classes I and II would result in little to no visual contrast resulting from the Proposed Action or alternatives. Therefore, there are no cumulative impacts to visual resources.

3.8 Soils

3.8.1 Affected Environment - Soils

The analysis area for soils is the proposed project area because soil-disturbing activities would only occur within this area. Soil information is derived from the Soil Survey of Owyhee and Canyon County Area, Idaho (USDA NRCS 2015). Malheur County soil information is derived from a fourth order soil survey conducted by the Oregon State Water Resources Board and Soil Conservation Service (OSWRB and SCS 1969).

Predominant landforms include alluvial fans and bottomlands giving way to moderately steep hills and canyons; rolling lava plateaus and dissected raw old lacustrine sediments occurring as “badland” areas are also found throughout the area. Occasional rock outcrops are a distinct feature of this landscape. Generally, these soils are derived from volcanic rock including rhyolite, welded tuff, and basalts. Most soils in the analysis area are well drained loams, gravelly loams, and sands. Common soils to the north and east include Graveya-Ratsnest- Rock outcrop association derived from volcanic ash or a loamy colluvium from welded tuff over lacustrine deposits, as common are Hardtrigger complexes originating from loess and loamy alluvium. Mckeeth-Veta gravelly loams, comprised of volcanic ash and mixed alluvium, are found to the east as well. To the south, Vitale-Cleavage-Bauscher complex and Snell-Kiyi association are commonly found. These soils consist of colluvium over bedrock derived from basalt, igneous rock, or welded tuff. To the west, soils are generally loamy, shallow, stony, and well drained residing over basalt, rhyolite, or welded tuff.

Wind erosion of the surface soil horizon is a problem in dry shrub and grassland communities following vegetation and biological crust disturbance. In addition to vegetation, biological soil crust plays an important role in protecting and stabilizing soils in these arid communities. Biological soil crust condition and spatial extent are indicators of the ecological health of the plant community; they influence site fertility; increase soil productivity; and aid in soil moisture retention and soil surface stability (Peterson 2001). Removal of vegetative cover or biological crust from events such as wildfire, wildlife and livestock grazing, or recreation expose the soil surface to temperature extremes, wind and rain, and may result in some level of soil erosion.

Soils are grouped based on their susceptibility to wind erosion. This rating, referred to as a Wind Erodibility Index (WEI), has values that range from 0 through 310 based on compositional properties of the surface horizon that are considered to affect susceptibility to wind erosion. Texture, size, and durability of surface peds, percentage of rock fragments, presence of carbonate, and the degree of decomposition of organic matter are the major criteria. Soils with an index above 160 are the most susceptible to wind erosion, while those with an index less than 38 are the least susceptible. In the analysis area[5], common soils (92 percent) are identified as having moderate to low susceptibility to wind erosion and have WEI values of 56 or less. A very small percentage of soils in the project area have high susceptibility with WEI values greater than 56.

Similarly, soil susceptibility to water erosion is quantified using what is referred to as a K factor. The K factor is an index with values that range 0.02 (least erodible) to 0.64 (most erodible), and indicate a soil's relative susceptibility to sheet and rill soil erosion. K factor is based on soil texture, organic matter content, structure, etc. Soils high in clay content have low K values because they resist detachment. Coarse textured soils (such as sandy soils) have low K values because of low runoff (USDA NRCS 2016). In contrast, soils high in silt have a high K factor because they are highly erodible (USDA NRCS 2016). The majority (82 percent) of soils within the analysis area have low susceptibility ($K \leq 0.2$) to erosion, whereas the remaining soils are split nearly equally between moderate ($K = 0.2 - 0.40$), and high susceptibility ($K \geq 0.41$) to water erosion. Vegetative community structure and other ground cover including biological soil crusts, gravel/rock, and plant litter play a key role in soil stability and function.

[5] WEI and K Factor were not available for soils mapped as part of the Malheur County forth order soil survey (OSWRB and SCS 1969). Reported values are derived from Owyhee and Canyon County soils layers and are assumed to be representative of the entire analysis area because soils in Oregon developed from similar parent material, and experienced similar climate and disturbance regimes.

In 2015, the Soda fire burned a large portion of the analysis area. Field reconnaissance of the Soda fire revealed that most of the burned area soils fell into a moderate to low burn soil severity classification within every region despite the moderate to high fire intensity that was uniformly distributed across most of the burn. Areas with a high burn severity classification were limited to several relatively small and scattered locations, mostly in the central to southern part of the fire (USDI BLM 2015a).

3.8.2 Environmental Consequences – Soils

3.8.2.1 Alternative 1 – No Action

No treatments would occur under this alternative to reduce the scale of wildfire within the analysis area. As a result, large or frequent wildland fires would continue to occur, removing protective vegetation and damaging biological crust, which reduces soils ability to resist the erosional forces of wind and water and exposes soils to thermal extremes. Large-scale surface soil erosion is anticipated under this alternative. Post-fire ESR treatments would help limit soil erosion from burned sites.

Further decreases and/or compositional changes in soil organisms and biological soil crusts would occur in areas dominated by annual grasses and forbs over time. Increases in soil erosion and decreases in soil organisms and biological soil crusts would lower site productivity over the long-term.

3.8.2.2 General Effects of Action Alternatives

The following section presents the effects common to the action alternatives.

Mowing

Compaction of the surface soil horizons would be a minor short-term effect from mowing sagebrush using a rubber-tired tractor pulling a deck mower. Compaction decreases the number and size of pores in the soil matrix potentially effecting water infiltration, permeability, and air exchange. This effect would be more pronounced on fine textured soils (i.e. silts and clays). Normally, only one pass with a tractor would be made in the same location during implementation, so compaction would be minimal and confined to those areas where tractor tires cross. Disturbance to soil surface horizons, including biological soil crusts, would also be confined to those areas where the tractor tires cross. Sagebrush and the herbaceous understory would be left at a height of at least six inches and the remaining cut debris would be left on-site. As a result, soil erosion from wind or water in mowed areas would not be expected to increase above normal levels. No long-term effects or indirect effects to the soil resource from mowing would be expected. Maintenance mowing would occur infrequently (every 5-10 years); therefore, added soil compaction or erosion from mowing would not be expected.

Hand Cutting

Short-term effects to the soil resource from using chainsaws to thin sagebrush and other woody species would be minimal and confined to those areas where removed material was piled and burned. If burn piles are large or burn very hot, small areas of the soil surface underneath these burned piles could become sterilized and unable to support vegetation until adjacent soil is deposited onto these locations over time. Soil erosion from these burned areas could occur until vegetation is reestablished. Limiting pile size, location, and burning when soils are either wet or frozen would help to minimize the potential for soil sterilization and long-term wind and water erosion potential. No indirect effects would be expected. If woody material is removed off-site following sagebrush thinning no effects to the soil resource would occur.

Prescribed Fire

Prescribed fire used to remove accumulated weeds along fence lines or in topographic depressions would be light in intensity and of short duration causing little to no subsurface heating of the soil and therefore little to no short or long term effects to the soil resource are anticipated. Where weeds are thick (~10 inches or greater) or thinned and piled sagebrush debris is burned, short term effects may include the consumption of organic matter in the soil surface horizon and subsequent loss of some nutrients (e.g. nitrogen) through volatilization. Biological soil crusts (particularly mosses and lichens), if present, could be damaged or killed by prescribed fire. Removal of vegetation and soil crusts would expose soils to thermal extremes, reducing the soils ability to resist the erosional forces of wind and water. Depending on the severity of the impact to soils, vegetation may reestablish in the short-term; if soils are sterilized, long-term soil deposition may be needed before soils would support vegetation. No indirect effects would be expected.

Herbicides

Impacts to the soil resource from the application of BLM approved herbicides and adjuvants for the control of invasive, non-native vegetation species have been assessed in the *2007 Vegetation Treatments Using Herbicides on BLM Lands in the 17 Western States Programmatic EIS (PEIS) and Herbicides Approved for Use on BLM Lands in Accordance with the 17 PEIS ROD – May 14, 2014 update, 2016 Final PEIS for Vegetation Treatments Using Aminopyralid, Fluroxypyr, and Rimsulfuron on BLM Lands in 17 Western States DOI-BLM-WO-WO2100-2012-0002-EIS,* and *Vegetation Treatments Using Herbicides on BLM Lands in Oregon Final Environmental Impact Statement (2010) and Record of Decision (2010)*. The direct, short and long-term effect of herbicide application to existing biological soil crusts is largely unknown (Peterson 2001). Depending on the type of herbicide used, organisms in other portions of the soil profile may be affected. Herbicide use for seedbed preparation followed by drill seeding, would reduce or eliminate existing vegetation cover, resulting in a short-term increase in soil surface temperature, dryness, and wind erosion potential (and water erosion potential on steeper terrain) until planted fuel break species become established. An indirect effect could include damage and/or death of non-target vegetation due to off-site movement of herbicides adsorbed to soil particles, however avoiding the use of pre-emergent herbicides on highly erodible soils where vegetation cover has been removed would minimize this potential.

Vegetated Fuel Break

Areas identified for vegetated fuel breaks (i.e., green strips) may or may not require seeding and mechanical seedbed preparation such as disking. Where disking would be necessary, erosion by wind would be the primary short-term effect to the soil resource. Short-term soil erosion by water could also occur on steeper terrain (> 20% slope) until seeded vegetation establishes and helps protect soils from erosion. Disking would result in the immediate disturbance of biological soil crusts where they exist and could affect the presence and abundance of soil microorganisms (cyanobacteria fungi, etc.) that contribute to overall soil quality. Soil organisms living close to the soil surface would be exposed to desiccation and predation. Recovery rates for biological crust are generally species dependent, and can range from 14 to 35 years for cyanobacteria, 45 to 85 years for lichens, and 20 to 250 years for mosses (Peterson 2001), representing a long-term loss in soil stability and productivity until seeded vegetation and associated biological crust reestablish.

Erosion by wind would be the primary short-term impact from drill seeding using a standard rangeland drill. Depending on the type of vegetation present on-site during implementation, some or all of the vegetation cover and biological soil crusts would be removed. Soil surface horizons to a depth of 2-4 inches (Asher and Eckert 1973) would be disturbed altering soil aggregates and making the soil susceptible to wind erosion (and water erosion on steeper terrain) as well as increases in temperature and dryness for a year or more until planted species become established. In areas where cheatgrass or medusahead are the dominant herbaceous species, drill seeding would remove most to all of the vegetation cover. Perennial bunchgrasses and sod forming grasses where they exist would, for the most part, survive a drill seeding disturbance and would provide partial vegetation cover thereby limiting short-term increases in temperature, dryness, and erosion potential. Use of a no- till drill for seeding would substantially decrease the depth and extent of soil disturbance, making increases to soil temperature, dryness, and erosion potential a minor effect.

Increased erosion potential would last until seeding establishment is adequate to prevent soil movement by wind and water, approximately one to three years for each treated area. Soil movement due to wind in the linear treatment areas could blow onto roads or adjacent untreated areas. This impact is expected to be sporadic, corresponding with wind events. While most of the proposed fuel break segments occur on relatively flat topography, water erosion could occur in treatment areas that occur on slopes, resulting in formation of rills and soil deposition at the bottom of the slope. This impact is expected to be sporadic, corresponding with high intensity rain events.

Maintenance treatments are not anticipated to result in increased soil surface erosion once seeded species are established. Maintenance would consist of mowing or hand cutting shrubs from the fuel break and/or chemical treatments to control noxious and invasive weeds. Effects on the soil resource from mowing, hand cutting, and chemical treatments are described above.

Targeted Livestock Grazing

Direct short-term effects to the soil resource from hoof action during targeted grazing would include removal of vegetation cover and disturbance of the soil surface horizon (including biological soil crusts where they exist) and a subsequent increase in temperature, dryness, and wind erosion potential (and water erosion potential on steeper terrain). The depth of this disturbance in the soil profile is much less than either disking or drill seeding (less than 1 inch on dry soils and approximately 1-2 inches on wet soils) making the potential for soil loss through erosion considerably less compared to either of these two methods. Over the long-term, targeted grazing without additional treatment methods would have to occur on a yearly basis over the same area to be an effective fuel break, making the soil surface horizon vulnerable to erosional processes for as long as the fuel break is maintained. When combined with establish vegetated fuel breaks, vegetation would help protect soil surface horizons and biologic crusts where they exist, reducing short-term disturbance, temperature increase, drying, and wind and water erosion.

Continued reductions in disturbance and associated erosional processes are expected under long-term targeting grazing.

Management of grazing activities that maintain sufficient vegetation cover (2 inch stubble height) would help to ensure that erosion levels are kept to minimal levels.

3.8.2.3 Alternative 2 – Proposed Action

Under this alternative, roughly 25,517 acres would have vegetated fuel breaks. The majority (87 percent) of these fuel breaks would be located in areas identified as having moderate to low susceptibility to wind erosion. Similarly, 73 percent of these soils would have low susceptibility to water erosion.

Targeted grazing would occur on approximately 2,006 acres. The majority (79 percent) of targeted grazing would occur in areas identified as having moderate to low susceptibility to wind erosion. The majority, 75 percent, of these soils would have low susceptibility to water erosion.

Proposed road improvement and maintenance actions would represent permanent soil surface disturbance and compaction across the 35 foot road surface. In areas with a high percentage of silt and clay in the road surface, aggregate may be applied to roadway surfaces to harden surfaces, improving road safety and durability. Limited sections of road may be rerouted to accommodate larger fire suppression vehicles resulting in permanent soil disturbance in these areas.

Appropriate engineering designs such as use of culverts, ditches, and sediment barriers would reduce erosion on and adjacent to roadways, resulting in minor, short-term soil loss following rain events, and grading and maintenance activities.

Road maintenance would affect 1,912 acres in the analysis area. Of these soils, 89 percent and 73 percent have low to moderate WEI and K factor, respectively.

General direct and indirect effects related to vegetated fuel breaks and targeted grazing are described above. Implementation of the Proposed Action would result in short-term disturbance (1 to 5 years) to soil resources. However long-term impacts would be reduced when compared to Alternative 1 because the scale of wildfire would be reduced due to treatment activities. As perennial vegetation and biological crust recover, long-term soil productivity and resistance to disturbance would improve. Maintenance treatments are not anticipated to result in increased soil surface erosion once seeded species are established.

Short-term effects to soil resources would occur along the outer edge of maintained road surfaces. Side cast from road blading and installation of drainage features would disturb soil surface horizons. Minor surface erosion would occur until vegetation established in these disturbed areas (1 to 5 years). Long-term disturbance would occur where existing narrow, poorly maintained roads were expanded to 35 feet wide. Surface soil horizons would be bladed and mixed with gravel fill and underlying mineral soil. This impact would be for the life of the road.

3.8.2.4 Alternative 3 – Modified Proposed Action

Approximately 11,771 acres would have vegetated fuel breaks in this scenario. This represents a decrease in soil resource disturbance of over 50 percent compared to the Proposed Action. Targeted grazing would occur on approximately 1,702 acres; a 15 percent reduction in the amount of targeted grazing when compared to the proposed action.

General direct and indirect effects related to vegetated fuel breaks, and targeted grazing would be similar to those described for the Proposed Action. Implementation of this alternative would result in reduced short-term soil resource impacts when compared to the Proposed Action, due to a reduction in the amount of ground-disturbing activities. Over the long term, impacts to soils due to wildfire would be greater than for the Proposed Action. This increase in wildfire risk would be due to the anticipated decrease in fuel break effectiveness from reduced fuel break widths.

3.8.3 Cumulative Effects – Soils

The cumulative effects analysis area is the project area including a 0.25 mile buffer. This buffer includes the Hemingway substation and would include portions of the Boardman to Hemingway and Gateway West transmission line projects proposed in the area. The temporal scale for cumulative impacts to soil resources is 10 years; which includes implementation of the Soda Fire ESR Plan, and may include transmission line construction. Of the actions identified for consideration of cumulative effects, wildfire, livestock grazing and recreation have shown to have the most potential for impact because these are chronic impacts, occurring year after year. Recreation impacts are largely from dispersed activities and with the phased in implementation of the project, no cumulative impacts would be expected. Soil impacts from livestock grazing would largely be dispersed, although concentrated impacts occur especially near gates, water troughs, mineral supplementation sites, and where trailing occurs. Transmission line construction would result in short-term impacts at sites temporarily disturbed by vegetation removal and compaction from heavy equipment. Long-term impacts would occur along improved existing roads and newly constructed roads, increasing the likelihood of soil erosion at these sites. Decommissioning activities, when they occur, would also result in exposed soils and accelerated erosion for a period of time until vegetation reestablishes. Compaction of soils would occur where heavy equipment traffic takes place during construction, operations, and decommission.

Revegetation and erosion control treatments completed as part of the Soda Fire ESR Plan would benefit soil in the long-term by promoting perennial vegetation establishment and controlling surface water flow. Wildfire will continue to burn through the area however, ESR implementation would reducing fire size and intensity through the use of vegetative fuel breaks and targeted grazing. Smaller and less intense fires would limit vegetation and biological crust damage, helping protect soils from exposure to climate extremes and wind and water erosion.

Past, present, and foreseeable future actions within the project area would continue to have moderate impacts to the soil resource through disturbance of soil structure, biological crusts, and subsequent exposure of the upper soil horizons to erosional forces resulting in soil loss and decreased productivity. The action alternatives would only slightly increase the cumulative impacts to the soil resource while providing treatments to reduce the long-term effects of erosion from large burned areas on the landscape from frequent wildland fire.

3.9 Air Quality

3.9.1 Affected Environment – Air Quality

The analysis area for air quality is Owyhee and Malheur Counties which are designated as Class II air quality areas, as is most of Idaho and eastern Oregon. Areas of Class II need reasonably or moderately good air quality protection. Much of the focus on air quality in the region has centered on the Treasure Valley, which is the largest and most highly populated urban area in Idaho. Although air pollution is generated in Owyhee County and Malheur County as well, the location and distance from other populated areas in the valley prevent significant exchange of air pollutants.

Impacts to air quality across the project area can be derived from several sources including wildfire, prescribed fires, agricultural operations, fugitive dust, and to a small degree vehicle emissions. Other activities that remove vegetation and create fugitive dust include vegetation treatments using a plow and/or drill, livestock grazing, and off-highway vehicle use.

3.9.2 Environmental Consequences – Air Quality

3.9.2.1 Alternative 1 – No Action

There would be no impacts to air quality from establishing fuel breaks. However, the spread of invasive annual grasses such as cheatgrass and medusahead would increase wildfire activity (Balch et al. 2013), and increased periods of smoke throughout the area. Smoke from a wildland fire event would expectedly degrade air quality of Idaho Department of Environmental Quality (IDEQ) designated PM10 limited maintenance areas and/or impact zones such as the city of Boise.

The effects on climate change from establishing fuel breaks would be minimal. Fuel breaks would reduce the amount of carbon released into the atmosphere by minimizing the extent of fires that burn through the area. Establishing fuel breaks would likely have minimal if any measureable impacts to carbon sequestration as the habitats in the proposed project area do not store much carbon.

3.9.2.2 All Action Alternatives

Occasional prescribed fire would be of short duration due to the light fuels that would make up the majority of prescribed fire areas. Smoke from such fires would cause short-term localized adverse impacts to air quality at the time of burning. Burning within prescription and participation in the Montana Idaho Airshed Group Prescribed Fire Program would keep airshed emission levels within the IDEQ's air quality standards. The Vale District complies with the Oregon Smoke Management Plan, with the goal of minimizing emissions from prescription burning consistent with air quality objectives of State and Federal clean air laws. Smoke could possibly be present for two to three hours, but the likelihood would be low due to the type of fuels being targeted and by burning within prescription. The likelihood of smoke being present for periods longer than two to three hours is negligible. The overall effects to air quality from prescribed burning would be minimal.

Disking and seeding of fuel breaks could increase the levels of dust in the area. Seeding would occur in early to late fall when precipitation would be expected reducing the likelihood of dust. Highly erodible soils would be seeded using methods that minimize soil disturbance, which would also reduce the likelihood of dust.

3.9.2.3 Alternative 2 – Proposed Action

Road maintenance/improvement activities including grading and blading roads could have sort term impacts to air quality; however, dust suppression activities would minimize the impacts. The effects of the Proposed Action on fire would indirectly impact air quality by reducing fire intensity and providing the largest margin of success for suppression crews in battling wildfire, thereby reducing areas burned and reducing air pollutants from wildfire.

3.9.2.4 Alternative 3 – Modified Proposed Action

The indirect effects of the Alternative 3 on air quality would be much lower, as there would be a lower margin of success for suppression crews in battling wildfire, which would not reduce air pollutants from wildfire to the same extent as the Proposed Action.

3.9.3 Cumulative Effects – Air Quality

The action alternatives analyzed would not cause measureable degradation to air quality so no cumulative effects would result.

3.10 Livestock Grazing Management

3.10.1 Affected Environment – Livestock Grazing Management

The analysis area for livestock grazing management includes all allotments that intersect the project area boundary because project actions will not take place beyond these allotment boundaries and while allotments are divided into pastures, permit and management actions can affect the entire allotment. Within the analysis area, the BLM manages all or part of 50 grazing allotments with active permits (Table 3.10-1). Livestock use is from cattle and/or horses at various times throughout the year. Available forage in grazing allotments is allocated based on expected pounds per acre of herbaceous biomass for a given area. The amount an average cow and calf consume in a typical one month period is estimated to be 800 pounds, and is referred to as an Animal Unit Month (AUM). Grazing permits are issued based on the expected AUMs that the allotment can support without damaging soil or vegetation resources.

Table 3.10-1. Grazing Allotments within the Project Area

Allotment Name	Operator	Livestock Type[1]	Season of Use	Active AUMs	Suspended AUMs
Board Corrals	Bar 71 LLC.	C	3/1-5/30	911	762
		C	11/1-2/28	734	0
		H	3/1-5/30	24	0
		H	11/1-2/28	32	0
	Sam And Bonnie Mackenzie	C	11/1-2/28	331	172
		C	3/1-4/1	88	0
		H	4/1-10/31	28	0

Allotment Name	Operator	Livestock Type[1]	Season of Use	Active AUMs	Suspended AUMs
	Larry & Kay Davis	C	11/1-2/28	335	172
		C	3/1-4/1	89	0
		H	4/1-10/31	21	0
	Mark Mackenzie LLC.	C	11/1-4/1	700	311
Rockville	Glenda Or Ted L. Gammett	C	10/1-2/28	45	20
	Mary Ellen Allison	C	4/1-10/5	1,050	472
	Greeley Trust, Andrew & Mary Irene	C	4/1-10/5	1,050	473
	Bar 71 LLC.	C	4/1-9/30	541	480
Spring Mountain	Baltzor Cattle Co.	H	4/1-9/30	42	0
	Mark Mackenzie LLC.	C	12/1-2/28	77	0
		C	4/1-9/30	3,117	1,532
		H	4/1-9/30	42	0
	Cow Creek Ranch	C	4/5-9/30	927	459
		C	12/1-2/28	3	0
	Tim McBride	C	4/1-9/30	1,413	607
		C	11/2-2/28	266	0
	Doug Burgess	C	4/1-9/30	584	289
Three Fingers	Cunningham Ranch	C	3/1-10/31	2,777	1,368
		C	10/1-2/28	40	0
		H	4/1-10/31	49	0
	Mark Mackenzie LLC.	C	3/1-10/31	830	631
		C	10/31-3/31	710	0
	Crater Land And Livestock	C	11/1-3/31	845	347
	Greeley Trust, Andrew & Mary Irene	C	3/1-10/30	1,507	736
		C	10/28-2/28	122	0
		H	4/1-10/30	35	0
	Mary Ellen Allison	C	3/1-10/22	1,583	764
		C	6/1-2/28	81	0
	Bar 71 LLC.	C	3/1-10/31	1,396	600
		H	4/1-10/31	91	0
East Cow Creek	Jeff Anderson Estate	C	4/1 - 6/10	183	38
	John Stoddart	C	4/1 - 11/30	1,697	428
		C	10/1 - 2/23	86	0
	Elordi Cattle Co. LLC.	C	4/1 - 6/15	388	97
	James Hayhurst	C	4/1 - 6/15	155	40
	Terry Ranch Partnership	C	4/1 - 8/25	242	58
	Clint And Laura Fillmore	C	4/1 - 9/30	640	300
	Cow Lakes Grazing Association	C	4/1 - 8/30	397	110
		C	9/1 - 2/28	48	
	Terry Warn	C	4/1 - 8/30	2648	642
	Charles Pippus	C	12/1 - 2/28	18	0
Tunnel Canyon	Bar 71 LLC.	C	3/21-10/31	888	615
		C	11/1-12/31	493	
Bass FFR[2]	Tony & Brenda Richards	C	12/1-12/30	46	0
		C	12/1-12/31	46	0

Allotment Name	Operator	Livestock Type[1]	Season of Use	Active AUMs	Suspended AUMs
Blackstock Springs	Ted Blackstock	C	5/1-11/15	1052	0
	Chipmunk Grazing Assoc.	C	5/1-11/18	190	0
	Alan Johnstone	C	5/1-11/15	192	0
Burgess	Doug Burgess	C	4/16-8/15	240	0
Canal	Glenda Gammett	C	11/1-3/14	48	0
Chipmunk Field FFR	Chipmunk Grazing Assoc.	C	12/1-12/31	72	0
Con Shea	Joyce Livestock Co.	C	11/1-2/28	990	0
Corral Creek FFR	Alan Johnstone	C	12/1-12/31	9	0
East Reynolds Creek	Jaca Livestock	C	4/5-6/30	1,434	829
	Chipmunk Grazing Assoc.	C	4/5-6/30	547	330
Elephant Butte	Ted Blackstock	C	3/15-5/31	305	0
		C	12/1-2/28		
	Chipmunk Grazing Assoc.	C	4/1-5/31	85	0
		C	11/1-12/31		
Evans FFR	Hook Family LLC.	C	3/1-11/30	84	0
Gaging Station FFR	Jerry Hoagland	C	6/1-9/30	4	0
Graveyard Point	Alan Johnstone	C	5/1-6/15	129	0
Gusman	Gusman Ranch Grazing Assoc. LLC.	C	4/16-10/30	1,731	1,946
Gusman FFR	Gusman Ranch Grazing Assoc. LLC.	C	11/1-11/30	26	0
Hardtrigger	Junayo Ranch Ltd. Partnership	C	4/1-11/30	70	64
	Daniel & Bailey Richards	C	4/1-10/31	35	45
		C	4/1-10/31	820	694
	Tim & Gwen Miller	C	4/1-10/31	635	308
Jaca FFR	Jaca Livestock	C	3/1-11/30	61	0
Joint	John Isernhagen	C	4/16-11/13	601	0
Jordan Valley	06 Livestock	C	5/1-8/15	30	0
		H			
Joyce FFR	Joyce Livestock Co.	C	11/1-2/28	87	0
		H	4/1-7/31		
Jump Creek	Hook Family LLC.	C	7/1-9/30	450	0
	Chipmunk Grazing Assoc.	C	6/1-9/30	494	0
		C	7/1-9/30	95	0
	Jaca Livestock	C	7/1-9/30	188	0
Juniper Spring	Ed & Debby Wilsey	C	3/1-11/30	1,715	0
Louse Creek	Craig & Rhonda Brasher	C	5/1-10/31	1,915	1,169
		H			
Lowry FFR	Lu Ranching Co.	C	3/1-2/28	6	0
Madriaga	Chad & Dannelle Hensley	C	6/1-12/1	647	0
Poison Creek	Poison Creek Grazing Assoc.	C	4/1-11/30	740	21
		H	4/1-11/30		
R Collins FFR	Sean & Andrea Burch	C	3/1-2/28	24	0
Rabbit Creek/Peters Gulch	Hook Family LLC.	C	5/1-8/8	2193	1892
		C	11/1-2/28		
Rats Nest	Chipmunk Grazing Assoc.	C	4/1-5/27	557	160

Allotment Name	Operator	Livestock Type[1]	Season of Use	Active AUMs	Suspended AUMs
Reynolds Creek	Junayo Ranch Ltd. Partnership	C	3/17-6/1	2,032	1,972
		C	10/1-2/28		
	Bill Watterson	C	3/15-8/1	104	46
	Tony & Brenda Richards	C	4/1-8/1	1,657	779
		C	10/15-12/31		
	Daniel & Bailey Richards	C	4/1-8/1	81	35
Rockville	Glenda Gammett	C	3/15-10/31	2,112	125
	Poison Creek Grazing Assoc.	S	4/1-5/31	176	10
		S	10/1-10-31		
Sands Basin	Chipmunk Grazing Assoc.	C	4/1-6/5	999	0
		C	10/1-10/31		
Shares Basin	Ted Blackstock	C	4/1-11/30	1,419	320
	Ken Sevy	C	4/1-7/15	1,419	320
		C	10/1-11/30		
Silver City	Wintercamp Ranch Trust	C	3/15-10/31	695	888
	Joyce Livestock Co.	C	3/15-10/31	4,237	5,128
		H			
Soda Creek	Elordi Sheep Camp Inc.	C	6/1-10/31	33	0
	Elordi Cattle Co. LLC.	C	6/1-10/31	467	0
		H			
Strodes Basin	Alan Johnstone	C	3/15-5/31	1,978	7
		C	11/15-12/31		
Trout Creek	Sean & Andrea Burch	C	4/1-10/31	342	0
Tyson FFR	Junayo Ranch Ltd. Partnership	C	12/1-12/31	69	0
Akali-Wildcat	Chipmunk Grazing Assoc.	C	04/01-05/31	469	0
	Ted Blackstock	C		154	0
Burgess FFR	Doug Burgess	C	12/01-12/31	11	0
Bush Ranch FFR	Ed Wilsey	C	03/01-02/28	24	0
Corral FFR	Alan Johnstone	C	12/01-12/31	9	0
Cow Creek Ind.	Tim Lowry	C	04/01-09/30	1,214	0
Murphy FFR	Paul Nettleton	C	03/01-03/31	5	0
Stateline	Tim McBride	C	07/15-12/16	102	0
Walker FFR	Ted Blackstock	C	03/01-03/31	8	0
	Ken Sevy	C			0

[1] C = Cattle; H = Horse

[2] Fenced Federal Range - Grazing allotments consisting a high percentage (>30%) of unfenced private lands compared to BLM administered lands. Permits are issued for the percent of BLM lands only.

Much of the native perennial rangeland in the project area has burned by the Soda Fire and subsequently has been seeded. Table 3.10-1 reports the number of total permitted use (active and suspended AUMs), once grazing resumes after ESR treatments are complete and objectives for grazing resumption are met. Areas burned by the Soda Fire will remain closed to livestock grazing for one full year and through a second growing season at a minimum unless targeted grazing is used as a treatment. Entire pastures have been closed or temporary three strand wire fences have been constructed to separate the burned portion from the unburned portion where practical.

The proposed treatment areas cross portions of 40 allotments. Proposed treatment areas typically comprise less than 10% of a pasture acreage, and in most cases less than 5%. These linear areas would be primarily located adjacent to travel routes that are used for trailing cattle and/or sheep.

3.10.2 Environmental Consequences – Livestock Grazing Management

3.10.2.1 Alternative 1 – No Action

Under the No Action alternative, the current trend of large-scale, frequent wildfires are expected to continue. Based on current BLM policy regarding post-fire stabilization and rehabilitation treatments, partial or full allotment closures for a minimum of 2 growing seasons or longer would continue to occur to allow for natural vegetation recovery and/or seeding establishment. Large continuous burned areas within allotments result in significant impacts to livestock operations, forcing operators to relocate livestock or find other means of providing livestock forage while the burned areas are being rested from livestock grazing, allowing vegetation to recover.

Repeated fire would maintain vegetation in an herbaceous state, which would provide greater forage availability when compared to shrub-dominated plant communities. However, repeated fire can also degrade plant communities, removing perennial vegetation in favor of invasive annual plants which respond rapidly following wildfire. These plant species provide adequate early season forage but become unpalatable quickly and do not produce the same quantity of forage produced by perennial plant communities.

3.10.2.2 Alternative 2 – Proposed Action

Implementing the Proposed Action would result in 21,040 acres of fuel break and 1,651 acres of road maintenance within allotment boundaries. Impacts would range from less than 1 percent of an allotment to 28 percent of the Lowery FFR (Table 3.10-2). In the short-term, operators would need some means of restricting livestock use along the linear fuel breaks where they cross allotments, while seeded vegetation is establishing. This could be accomplished by limiting water sources adjacent to the seeded areas, to keep livestock off seedings while they establish. Other options that could be employed would be active herding to keep livestock away from newly seeded areas, temporary electric fencing, altering rest rotation schedules, or deferring use to late fall/winter. In extreme cases when a substantial portion of a pasture is involved, temporarily closing the entire pasture may be required. The options available to livestock permittees vary by the terms and conditions that are specific to the individual grazing permit. These management adjustments represent a potential short-term loss in AUMs, and will vary by operator and allotment.

Table 3.10-2. Percent Ground Disturbance within Grazing Allotments.

Allotment Name	Total Allotment Acres[1]	Acres of Fuel Break	Acres of Road Maintenance	Percent Disturbance by Allotment
Alkali-Wildcat	6,211	25	0	0.4
Bass FFR	1,991	41	3	2.2
Blackstock Springs	17,337	587	45	3.6
Board Corrals	43,388	2,037	165	5.1

Allotment Name	Total Allotment Acres[1]	Acres of Fuel Break	Acres of Road Maintenance	Percent Disturbance by Allotment
Burgess	1,310	95	10	8.0
Burgess FFR	723	11	0	1.5
Bush Ranch FFR	1,219	15	0	1.3
Canal	4,495	193	13	4.6
Chipmunk Field FFR	12,970	287	24	2.4
Con Shea	12,030	90	8	0.8
Corral FFR	272	27	0	10.1
Cow Creek Individual	7,956	23	0	0.3
East Cow Creek	17,688	166	1	0.9
East Reynolds Creek	31,027	1,611	132	5.6
Elephant Butte	9,174	374	13	4.2
Evans FFR	5,225	243	20	5.0
Gaging Station FFR	598	73	6	13.2
Graveyard Point	3,778	302	24	8.6
Gusman	6,403	250	21	4.2
Gusman FFR	2,889	22	2	0.8
Hardtrigger	24,035	797	64	3.6
Jaca FFR	3,719	90	7	2.6
Joint	4,217	189	16	4.9
Jordan Valley	323	9	0	2.8
Joyce FFR	5,195	7	0	0.1
Jump Creek	17,785	783	64	4.8
Juniper Spring	9,907	271	19	2.9
Louse Creek	2,603	167	14	6.9
Lowry FFR	266	68	6	28.0
Madariaga	4,106	65	5	1.7
Murphy FFR	306	27	0	8.8
Poison Creek	5,280	622	51	12.7
R Collins FFR	435	67	5	16.5
Rabbit Creek/Peters Gulch	32,994	1,152	92	3.8
Rats Nest	5,531	212	17	4.1
Reynolds Creek	47,015	1,548	128	3.6
Rockville	37,431	1,104	85	3.2
Sands Basin	13,523	310	26	2.5
Shares Basin	16,401	569	38	3.7
Silver City	66,430	1,678	137	2.7
Soda Creek	8,798	182	15	2.2
Spring Mountain	48,105	1,224	106	2.8
Stateline	1,002	14	0	1.4

Allotment Name	Total Allotment Acres[1]	Acres of Fuel Break	Acres of Road Maintenance	Percent Disturbance by Allotment
Strodes Basin (Oregon and Idaho)	14,944	304	24	2.2
Three Fingers	138,799	2,473	195	1.9
Trout Creek	3,447	110	10	3.5
Tunnel Canyon	3,599	92	7	2.7
Tyson FFR	7,272	418	34	6.2
Walker FFR	625	18	0	2.9
Total	**710,777**	**21,040**	**1,651**	

[1]Based on GIS estimates.

In some cases, targeted grazing would be allowed to reduce annual vegetation build up before green strips are established. Targeted grazing may be used as a treatment for seed bed preparation, allowing livestock hoof action to break up the surface soil horizons before seeding. The use of targeted grazing would provide needed forage for a short period in those allotments that would not otherwise be grazed because they are currently being rested to allow post-fire vegetation to establish. Roughly 1,752 acres of targeted grazing would occur under this alternative. In the following 11 allotments: Alkali-Wildcat, Board Corrals, Canal, East Reynolds Creek, Elephant Butte, Graveyard Point, Hardtrigger, Poison Creek, Rats Nest, Reynolds Creek, Shares Basin.

Long-term benefits would be realized with potential smaller wildfires and an increased potential for successful vegetation treatments to restore native sagebrush steppe habitat. Perennial vegetation communities provide a larger quantity of high quality forage than annual grass communities. Road maintenance would improve the safety of livestock transportation to and from allotments and facilitate livestock trailing.

3.10.2.3 Alternative 3 – Modified Proposed Action

Impacts to livestock grazing under this alternative would be similar to those described under the Proposed Action. Fuel break treatment would impact approximately 10,544 acres within allotments. However, the reduced fuel break buffer width (total of 200 feet), compared to the Proposed Action would not be as effective at limiting the size of wildfires in the analysis area. As a result, more allotments and larger areas would need to be rested from livestock grazing following wildfire, reducing available AUMs for longer periods of time than under the Proposed Action. Targeted grazing treatment would be nearly the same as under the Proposed Action at 1,701 acres. Targeted grazing would occur in areas not seeded to prostrate kochia in some areas. It is anticipated that a targeted grazing fuel break would not be as effective a fuel break as combining prostrate kochia and targeted grazing. Transportation of livestock would not be as safe as under the Proposed Action.

3.10.3 Cumulative Effects – Livestock Grazing Management

The cumulative impacts analysis area for livestock grazing is the same as the affected environment analysis area described above, which includes an area greater than the direct footprint of the proposed project and would include portions of the Boardman to Hemmingway and Gateway West transmission line projects proposed in the area. The temporal scale for cumulative impacts to soil resources is 10 years; which includes implementation of the Soda Fire ESR Plan, and may include transmission line construction. Actions that could cumulatively affect livestock grazing are wildfire, vegetation treatments including noxious weed management, post-fire stabilization and rehabilitation treatments, construction and maintenance of the Gateway West and Boardman to Hemmingway transmission line projects, and recreation.

The No Action alternative would not have a network of fuel breaks constructed throughout the project area. Response time required to catch fires before they grow beyond the capabilities of initial attack would remain unchanged and landscapes more distant from improved roads with intact sagebrush steppe would remain most vulnerable to large fires. This would result in the continued trend of wildfires, post-fire burned lands rested from grazing for 1 to 5 years combined with activities such as transmission line construction could result in negative short-term cumulative impacts for some operators, depending on the location of transmission line roads and structures, and burned areas. Conversion from perennial plant communities to annual plant communities would reduce rangeland diversity and forage availability, putting further pressure on livestock operators. Recreation and vegetation treatments would continue to occur in the analysis area. Recreation disturbance is dispersed and would likely increase over time as would the occurrence of noxious weeds; however, these impacts would not result in cumulative effects to livestock grazing management. Transmission line construction may occur and limit herd access to some areas. Temporary disturbance associated with transmission line construction would be reclaimed, resulting in a short-term loss of AUMs.

Cumulative effects for action alternatives are not anticipated. Wildfire size is anticipated to decrease. Native and seeded vegetation would mature over the long-term, providing quality forage for livestock grazing. Recreation would continue to occur in the analysis area. Recreation disturbance is dispersed and would likely increase over time as would the occurrence of noxious weeds; however, these impacts would not result in cumulative effects to livestock grazing management. Transmission line construction may occur and limit livestock access to some areas within select allotments. Temporary construction disturbance would be reclaimed and rested from grazing until monitoring criteria were met, resulting in a short-term loss of AUMs.

3.11 Wild Horses and Burros

3.11.1 Affected Environment – Wild Horses and Burros

The analysis area for wild horses is the same as the project area. Portions of four Herd Management Areas (HMA) are located within this analysis area: Sands Basin, Hardtrigger, Black Mountain, and Three Fingers in Oregon. Each HMA has been studied to determine how many wild horses the area can support while also providing for other land uses and resource values. The overall capacity of the HMA to support wild horses is called its Appropriate Management Level (AML). Table 3.11-1 presents the AML and animal unit months (AUMs) allocated for the HMAs in the analysis area.

Table 3.11-1. Herd Management Area Allocated AML and Forage Level

Herd Management Area	Appropriate Management Level	Population Range	Forage (AUMs)
Hardtrigger	98	66 – 130	1,176
Black Mountain	45	30 – 60	540
Sands Basin	49	33 – 64	588
Three Fingers[1]	–	75-150	1,800

[1] AML not stipulated in Vale District RMP (USDI BLM 2002).

The Soda fire impacted all four HMAs. Burned areas within the Three Fingers HMA were not sufficient to justify reducing current herd numbers. In contrast, the other three HMAs were extensively burned, adversely impacting approximately 2,304 AUMs within these HMAs (USDI BLM 2015). Because all three herd management areas were burned by the Soda Fire, they will be closed to horse grazing for one full year and through a second growing season at a minimum or until monitoring or professional judgment indicate that health and vigor of desired vegetation has recovered to levels adequate to support and protect upland function.

In response to the Soda Fire, an emergency gather was conducted as a means to maintain the health of the herds and protect rangeland resources. The gather began on August 27, 2015 and concluded on September 4, 2015. A total of 308 horses were gathered from the Hardtrigger, Sand Basin, and Black Mountain HMAs. Several horses evaded capture Sand Basin HMA due to the complexity of the terrain and continue to use the area despite fire impacting 100 percent of the vegetation in the area. In the Black Mountain HMA, 10 horses were returned to the area because one-third of the HMA was not damaged by the Soda Fire. Future herd numbers will be determined based on resource objectives.

3.11.2 Environmental Consequences – Wild Horses and Burros

3.11.2.1 Alternative 1 – No Action

Under the No Action alternative, there would be no disturbance to the wild horse herd associated with fuel break treatment implementation and horse distribution would not need to be modified to allow for fuel break establishment. In the short-term, Hardtrigger and Sand Basin HMAs would continue to be rested until resource management objectives are reached. A greatly reduced herd would continue to use the Black Mountain HMA.

Large-scale wildfires are expected to continue to burn at current intervals. This would result in disturbance to the wild horses due to fire and suppression activities, potential for injury or death, loss of forage, possible exclusion from burned portions of the HMA, and potential for emergency gather to protect both the horses and recovering vegetation or new seedings. Repeated fire would maintain vegetation in an herbaceous state, which would provide greater forage availability when compared to shrub-dominated plant communities. However, repeated fire can also degrade plant communities via soil loss and noxious weed and invasive plant introduction and spread, reducing long-term rangeland diversity.

3.11.2.2 Alternative 2 – Proposed Action

Under the Proposed Action, up to 5,179 acres of fuel break treatment and would occur. Treated areas would be protected from wild horse use, typically two to three years post-treatment. This protection could occur via exclusion from pastures containing treatments, temporary electrical or wire fencing, or by modifying water availability in the vicinity of treated areas and would occur primarily in the Three Fingers HMA because herds are currently active in this HMA.

The fuel breaks and buffer areas would tolerate use by wild horses once established. In the Hardtrigger and Black Mountain HMAs, prostrate kochia would be used for fuel break treatments (1,111 acres), providing higher protein forage than grasses during late summer through winter when the nutritional quality of herbaceous vegetation drops (Waldron et al. 2010). While an indirect benefit for horses in these areas, the limited amount of prostrate kochia would have little impact on overall animal health.

Over the long-term, this alternative is expected to reduce wildfire size, which would result in protection of existing and recovering shrub communities. This would slow the conversion of shrub communities to herbaceous-dominated areas and allow for increased shrub cover, potentially resulting in a gradual decrease in available forage. Smaller, less frequent fires would reduce the potential for wild horse disturbance, injury, mortality, forage loss, and/or the need for emergency gather.

Treatment implementation and maintenance could result in short-term disturbance to wild horses due to increased human presence and use of prescribed fire and mechanical equipment. This disturbance would occur for the duration of treatments, typically 2 weeks or less for each treatment area. Individual herbicide effects on wild horses are described in the *Vegetation Treatments using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* (USDI BLM 2007a), the 2016 Final PEIS for *Vegetation Treatments Using Aminopyralid, Fluroxypyr, and Rimsulfuron on BLM Lands in 17 Western States* (USDI BLM 2016), and *Vegetation Treatments Using Herbicides on BLM Lands in Oregon* Record of Decision (2010).

Chemicals used for treatments to remove or reduce existing vegetation or to maintain fuel breaks pose little risk to horses. There is some risk to horses from consumption of Glyphosate-treated vegetation due to herbicide residues in grasses. However, Glyphosate would be applied to vegetation sprouting following prescribed burning; therefore it is anticipated that little vegetation would be present for consumption. In addition, disking would eliminate vegetation following chemical treatment. Risks to animals from these herbicides are low, as noxious weeds are treated with spot application and the treated weeds do not comprise a large proportion of the horses' diets. In addition, fuel break segments are along maintained roads and not within preferred areas; therefore horses would not likely be in treatment areas except for temporary passage. Only a fraction of the horses' habitat would be treated at any given time, further reducing the potential for consumption or foliar contact.

3.11.2.3 Alternative 3 – Modified Proposed Action

General direct, and indirect effects would be the same as under the Proposed Action. It is anticipated that wildfire size would not be controlled to the same extent as it would under the

Proposed Action. Indirect horse winter forage benefits from the availability of prostrate kochia would decrease with the decreased green strip buffer (634 acres) when compared with the Proposed Action.

3.11.3 Cumulative Effects – Wild Horses and Burros

The cumulative impacts analysis area for wild horse herds is the same as the affected environment analysis area described above, which includes an area greater than the direct footprint of the proposed project and would include portions of the Boardman to Hemmingway and Gateway West transmission line projects proposed in the area. The temporal scale for cumulative impacts to soil resources is 10 years; which includes implementation of the Soda Fire ESR Plan, and may include transmission line construction. Actions that could cumulatively affect wild horses are wildfire, vegetation treatment, post-fire stabilization and rehabilitation treatments, construction and maintenance of the Gateway West and Boardman to Hemmingway transmission line projects, and recreation.

The No Action alternative would result in the continued trend of larger, more frequent wildfires, post-fire burned lands rested from herd use for 1 to 5 years combined with activities such as transmission line construction could result in negative short-term cumulative impacts to horses, limiting their movements to areas with less disturbance and abundant forage. Conversion from perennial plant communities to annual plant communities would reduce rangeland diversity and alter forage availability for wild horse herds. Recreation and vegetation treatment would continue to occur in the analysis area. Recreation disturbance is dispersed and would likely increase over time, which may alter herd activities or result in injury if animals are harassed near roads and trails. Over the long-term, vegetation treatments would be designed to reduce noxious weed and annual plant occurrence, improving rangeland habitat for herds. Transmission line construction may occur and limit herd access to some areas. Temporary disturbance associated with transmission line construction would be reclaimed, resulting in a short-term loss of forage.

Cumulative effects for action alternatives are not anticipated. Wildfire size is anticipated to decrease. Native and seeded vegetation would mature over the long-term, increasing the availability of quality forage. Recreation disturbance is dispersed and would likely increase over time, which may alter herd activities or result in injury if animals are harassed near roads and trails. Transmission line construction may occur and limit livestock access to some areas within select allotments. Temporary disturbance would be reclaimed and rested from grazing until monitoring criteria were met, resulting in a short-term loss of AUMs.

3.12 Recreation

3.12.1 Affected Environment – Recreation

The analysis area for recreation is the proposed project area as proposed project disturbance would only occur in this area. Several high use recreation areas are found within the project area, and less concentrated recreation occurs throughout. Recreational activities include hunting, camping, biking, hiking, off-highway vehicle (OHV) use, horseback riding, rock hounding, and bird and wildlife watching.

The Hemmingway/Rabbit Creek/Wilson Creek Trail accounts for approximately 950 miles of motorized and non-motorized trails. Motorized use is concentrated in the Hemmingway and Rabbit Creek areas, while non-motorized use occurs in the Wilson Creek trail system. These trail systems are widely visited and are used to host organized events such as bike, running, and motorcycle races. This area sees approximately 75,000 visitors per year (USDI BLM 2015a). The Soda Fire burned though this area, and portions of the trail systems were damaged by suppression activities.

The Jump Creek area is popular for both motorized and non-motorized recreation. There are trails for motorized and non-motorized users, as well as facilities for camping. This area sees approximately 20,000 visitors per year. (USDI BLM 2015a). This area was impacted minimally by the Soda Fire.

3.12.2 Environmental Consequences – Recreation

3.12.2.1 Alternative 1 – No Action

The No Action alternative would result in no fuel breaks being constructed in the project area, no road maintenance, and no targeted grazing. There would be no immediate direct impact to recreational activities.

In the future, increased risk of large wildfires may affect the experiences of visitors. Fires may result in damage to facilities, and trail and recreational facility closures during the fire, and often during recovery. Fires may create dusty environments that are undesirable to visitors, and the scenic quality may be degraded. Dozer lines and hand lines created during suppression may become unofficial trails that can encourage cross-country use and detract from the recreationalist’s experience.

3.12.2.2 Alternative 2 – Proposed Action

Under the Proposed Action there may be direct impacts to recreational activities, but they are likely to be minimal and largely short-term. These may include degradation of the scenic quality due to the construction of fuel breaks. Prescribed fire activity may also result in area closures, and smoky or dusty conditions that impact recreation.

Increased road maintenance under the Proposed Action may facilitate increased access to portions of the project area for recreational purposes.

Over the long term, the Proposed Action may serve to limit the negative effects of large wildfires on recreational activities in the area.

3.12.2.3 Alternative 3 – Modified Proposed Action

Impacts under Alternative 3 would be similar to those described for the Proposed Action. However, the narrower fuel breaks may not be as effective at limiting the spread of large fires so, the negative impact of large wildfire may be higher under this alternative in the long-term. Additionally, under this alternative would not increase access to the area compared to the Proposed Action as no road and ditch maintenance would occur.

3.12.3 Cumulative Effects – Recreation

The area of analysis for cumulative impacts for recreation is the proposed project area. Actions that could cumulatively impact the resource are transmission lines, and wildfire.

Under the No Action alternative the effects of past, present and future foreseeable actions would likely result in a continuation of current trends in recreational activity. Fire would remain an important influence on the landscape and on recreational opportunities. Impacts by fire on recreation may be felt during and after the fires. Past fires have contributed to the spread of non-native annual grasses that lead to more intense fire behavior, and future fires are expected to continue that trend. The development of transmission lines in the project area may result in short term impact to the resource during construction, and long term impact due to road construction. There may be positive and negative impacts from road building, as roads may increase access, but detract from solitude.

The cumulative impacts under the Proposed Action and Alternative 3 would be similar. Under both action alternatives, the cumulative effects of transmission lines, and wildfire would have some impacts on the recreation resource. Road building associated with transmission line development may lead to better access for recreationalists, but may detract from the experience of those desiring solitude. The negative impacts from fire would be expected to decrease over time under the action alternatives, though to a lesser extent under Alternative 3.

3.13 Lands with Wilderness Characteristics

3.13.1 Affected Environment –Lands with Wilderness Characteristics

The analysis area for lands with wilderness characteristics is the proposed project area as proposed project disturbance would only occur in this area. Under the 1976 Federal Land and Policy Management Act (FLPMA), the BLM has numerous authorities to maintain inventories of all public lands and their resources, including wilderness characteristics, and to consider such information during the land use planning process. BLM Manual 6310 provides guidelines to assess public lands for wilderness characteristics that are not currently managed for such characteristics (that is, lands other than existing designated wilderness areas and wilderness study areas (WSAs).

Such assessment is based on determining whether certain roadless tracts of public land meet minimum Wilderness Act criteria, as follows:

- At least 5,000 acres in size or adjacent to other existing designated wilderness areas or wilderness study areas, and contain the following wilderness characteristics;
- Generally natural in appearance, and has either
- Outstanding opportunities for solitude, or
- Outstanding opportunities for primitive and unconfined recreation.

Additional supplemental values that are associated wilderness values are also recorded during the assessment but are not a determining factor for wilderness characteristic findings. The assessment reflects current conditions and was used to update wilderness inventories.

The process entails the identification of wilderness inventory units, an inventory of roads and wilderness characteristics, and a determination of whether or not the area meets the minimum Wilderness Act criteria (listed above). Units found to possess such characteristics are being evaluated during the land use planning process in order to address future management. The following factors are documented for each WIU:

Naturalness – Lands and resources exhibit a high degree of naturalness when affected primarily by the forces of nature and where the imprint of human activity is substantially unnoticeable. An area's naturalness may be influenced by the presence or absence of roads and trails, fences or other developments; and the nature and extent of landscape modifications.

Outstanding Opportunities for Solitude or Primitive and Unconfined Types of Recreation – Visitors may have outstanding opportunities for solitude or primitive and unconfined types of recreation, when the sights, sounds, and evidence of other people are rare or infrequent; where visitors can be isolated, alone or secluded from others; or where the area offers one or a combination of exceptional non-motorized, non-mechanical recreation opportunities.

Supplemental Values – does the area contain ecological, geological, or other features of scientific, educational, scenic, or historical value?

Wilderness Inventory Updates in Oregon

In February 2004, a citizen group provided the BLM Vale District with an inventory report containing maps, photos, and photo logs for 42 proposed new wilderness study areas (WSAs) or wilderness areas of critical environmental concern covering over 2.2 million acres of public land in the planning area (ONDA 2004). The group later submitted supplemental sets of digital photos, photo logs, and geographic information systems spatial data with additional or edited versions of their original submission from between 2007-2012 the BLM Vale District conducted wilderness inventory updates for public lands outside of designated WSAs (approximately 1.3 million acres in the planning area), following current inventory guidance. Interdisciplinary (ID) teams reviewed the existing wilderness inventory information contained in the BLM's wilderness inventory files, previously published inventory findings, and citizen-provided wilderness information.

The BLM identified preliminary boundaries for Wilderness Inventory Units and reviewed existing pertinent information within the unit to determine if data updates or additional field inventory information was needed. Updates and inventories were completed prior to conducting an evaluation of a given unit. Inventory unit boundaries are principally formed by public land boundaries and roads. The ID teams made final route and boundary determinations and, subsequently, evaluated wilderness characteristics in each unit. BLM staff compiled the new and existing photography, resource information, ID team discussion records, and route information into individual unit records. With this information, the ID teams then made draft wilderness characteristic determinations and provided these to BLM managers for final concurrence. This process is documented in further detail in USDI BLM (2011b). Final wilderness character determinations have been made available to the public on the BLM Vale District website at: http://www.blm.gov/or/districts/vale/plans/wce/malheur-index.php

In Idaho, BLM has not finalized their assessment of these lands; however, in Oregon, the project area contains portions of 20 wilderness characteristic evaluation areas. Of these areas, 8 were determined to meet the criteria to be lands with wilderness characteristics and are summarized in Table 3.13-1.

Table 3.13-1. Summary of Lands with Wilderness Characteristics Inventory Units within the Analysis Area

Inventory Unit Name	Wilderness Criteria						
	Size	Naturalness	Recreation	Solitude	Supplemental Values	Acres In Project Area	Acres Burned in Soda Fire
Wilderness Character							
Antelope Creek	Y	Y	Y	Y	Y	10,739	8,016
Bannock Ridge	Y	Y	Y	Y	Y	6,643	0
Board Corral Mountain	Y	Y	Y	Y	Y	14,971	0
Coal Mine Basin	Y[1]	Y	Y	N	Y	1,491	1,358
Dry Creek	Y[1]	N	N	N	Y	2,867	420
Goodyear	Y	N	N	N	Y	3,913	0
Honeycomb Contiguous	Y	Y	Y	Y	Y	88	0
Mahogany Mountain	Y	Y	N	N	Y	9,411	5
McBride Creek	Y	Y	N	N	Y	6,976	6,586
McIntyre Ridge	Y	Y	Y	Y	Y	14,610	0
Purser Ridge	Y[1]	N	N	N	N	3,127	0
Smith Butte	Y	Y	N	N	Y	6,707	0
Spanish Charlie Basin	Y	Y	Y	Y	Y	20,682	19,133
Spring Mountain	Y	Y	Y	Y	Y	18,312	6
Three Fingers Rock North	Y	Y	Y	Y	Y	12,276	0
Three Fingers Rock South	Y	Y	N	N	Y	8,124	0
Wilson Creek	Y	Y	N	N	Y	5,323	1,075
Total						**146,258**	**36,598**

[1] Meets size criteria within Vale and Boise BLM Districts combined. Does not meet any size criteria with the Vale District alone.

3.13.2 Environmental Consequences –Lands with Wilderness Characteristics

Treatments proposed in lands determined to have wilderness character were selected to maintain, protect and/or enhance values identified by BLM through the wilderness characteristics inventory. All proposed actions are designed to have only short-term, if any, impact to wilderness characteristics. Proposed treatments were also designed to: minimize the risk of invasion of cheat grass or noxious weeds; incorporate seed mixes, including native species, to enhance the natural character of the area; and utilize methodologies that minimize the short term visual and aesthetic impacts to the area. The proposed actions will not have a permanent impact to either the size of the inventoried wilderness characteristics unit or the individual wilderness characteristics.

Although the settlement agreement (ONDA v. BLM, 2010) prohibits actions that would cause an area, or portion thereof, to no longer meet the minimum wilderness criteria, the minimum impact techniques used in restoration that would temporarily reduce wilderness characteristics would not have long-term effects to lands with wilderness characteristics.

3.13.2.1 Alternative 1 – No Action

The No Action alternative would result in no fuel breaks being constructed in the project area, no road maintenance, and no targeted grazing. There would be no immediate direct impact to lands with wilderness characteristics. However, the long-term trend of conversion of native grasslands to annual grasslands resulting from disturbances such as fire would continue, decreasing the naturalness of these lands.

3.13.2.2 Alternative 2 – Proposed Action

Under the Proposed Action direct impacts to would be minimal and largely short-term during the construction of fuel breaks until seeded vegetation is established. Approximately 3,445 acres along roadways would become seeded fuel breaks in lands with wilderness characteristics.

Fuel breaks would reduce the size of wildfire in lands with wilderness characteristics, reducing the likelihood that natural perennial grass and shrub communities would be burned and converted to annual grassland, helping maintain lands with wilderness characteristics. Direct and indirect effects are not anticipated from targeted grazing treatment as they would occur on less than 1 percent of lands with wilderness characteristics.

Road improvement and maintenance may improve access to these lands along existing roadways, which would not affect individual wilderness characteristics in these areas. However, direct, long-term impact of the Spanish Charlie Basin WIU would occur under the proposed action with the improvement of 5.5 miles of primitive road across the center of the WIU. Impacts would be permanent, affecting the WIU’s naturalness and solitude.

3.13.2.3 Alternative 3 – Modified Proposed Action

Impacts under Alternative 3 would be similar to those described for the Proposed Action.

3.13.2.4 Cumulative Effects –Lands with Wilderness Characteristics

The area of analysis for cumulative impacts for recreation is the proposed project area. Actions that could cumulatively impact the resource are transmission lines, and wildfire.

Under the No Action alternative the effects of past, present and future foreseeable actions would likely result in a continuation of current trends in recreational activity. Increased recreational use in the analysis area is not anticipated. Fire would remain an important influence on the landscape and on recreational opportunities. Impacts by fire on lands with wilderness characteristics are often delayed, resulting from conversion of perennial grass and shrublands to annual grasslands. Past fires have contributed to the spread of non-native annual grasses that lead to more intense fire behavior, and future fires are expected to continue that trend.

The cumulative impacts under the Proposed Action and Alternative 3 would be similar. Under both action alternatives, the cumulative effects of recreation and wildfire would have some impact on lands with wilderness characteristics. Under the Proposed Action, road maintenance would occur, recreational use may increase slightly with improved access. It is not anticipated that this increase would detract from wilderness characteristics as increased use would likely be minor and dispersed.

The impacts from fire would be expected to decrease over time under the action alternatives, though to a lesser extent under Alternative 3, because fire size would be reduced, slowing the rate of native vegetation conversion to annual grassland.

3.14 Areas of Critical Environmental Concern

3.14.1 Affected Environment – ACECs

The analysis area for Areas of Critical Environmental Concern (ACECs) is the proposed project area because proposed actions would not occur outside of this area. There are six ACECs in the project area, five in Idaho and one in Oregon. Five of the ACECs were burned to varying degrees during the Soda Fire. However, the Spring Mountain ACEC was not burned. Table 3.14-1 identifies ACEC values and post-burn conditions for each ACEC (USDI BLM 2015a).

Table 3.14-1. ACECs within the Project Area

ACEC Name / Location	ACEC Acres	ACEC Values (per RMP)	Post-burn Condition
Coal Mine Basin Idaho/Oregon	Total: 2,408.2 Burned: 2,246.4 Unburned: 161.8	Special status plants, scenic values, fossils.	Ash outcrops unburned to low intensity. Surrounding vegetation moderate to high intensity burn. Exclosure fence corner posts burned.
Jump Creek Canyon Idaho	Total: 612.5 Burned: 610.1 Unburned: 2.4	Riparian community, Wyoming sagebrush-bluebunch community, wildlife, scenic values, recreation	Upland vegetation high burn intensity. Riparian low intensity on lower stretch; moderate intensity upstream. Few impacts to recreation facilities.

ACEC Name / Location	ACEC Acres	ACEC Values (per RMP)	Post-burn Condition
McBride Creek Idaho	Total: 261.6 Burned: 261.6 Unburned: None	Special status plants	Ash outcrops unburned to low intensity. Surrounding vegetation moderate to high intensity burn. Exclosure fence mostly intact.
Sommercamp Butte Idaho	Total: 439.7 Burned: 439.7 Unburned: None	Mountain mahogany-bluebunch wheatgrass and oceanspray communities, scenic values	High-intensity burn in much of the mountain mahogany.
Spring Mountain Oregon	Total: 994.7 Burned: None Unburned: 994.7	Three vegetation plant cells, including two upland cells and one riparian cell.	ACEC was not burned.
Squaw Creek Idaho	Total: 145.6 Burned: 145.6 Unburned: None	Wyoming sagebrush-bluebunch wheatgrass community	Northern portions with moderate to high burn intensity. Southern portion unburned.

3.14.2 Environmental Consequences - ACECs

3.14.2.1 Alternative 1 – No Action

Without a strategic network of fuel breaks to facilitate containment and reduce the amount of acres burned annually, large and/or frequent wildfires are expected to occur across the project area, based on wildfire trends over the last 30 years. ACEC values for vegetation, SSP, scenic values, fossils, and recreation would continue to be degraded due to wildfire as discussed in Sections 3.3 – General Vegetation Including Noxious and Invasive Weeds, 3.4 – Special Status Plants, 3.6 – Cultural Resources, 3.7 – Visual Resources, 3.12 – Recreation, and 3.13 - Lands with Wilderness Characteristics.

3.14.2.2 Alternative 2 – Proposed Action

Under the Proposed Action, ACEC values for vegetation, SSP, scenic values, fossils, and recreation would be affected as discussed in Sections 3.3 – General Vegetation Including Noxious and Invasive Weeds, 3.4 – Special Status Plants, 3.6 – Cultural Resources, 3.7 – Visual Resources, 3.12 – Recreation, and 3.13 - Lands with Wilderness Characteristics.

3.14.2.3 Alternative 3 – Modified Proposed Action

Under Alternative 3, ACEC values for vegetation, SSP, scenic values, fossils, and recreation would affected as discussed in Sections 3.3 – General Vegetation Including Noxious and Invasive Weeds, 3.4 – Special Status Plants, 3.6 – Cultural Resources, 3.7 – Visual Resources, 3.12 – Recreation, and 3.13 - Lands with Wilderness Characteristics.

3.14.3 Cumulative Effects - ACECs

Cumulative effects for ACEC values for vegetation, SSP, scenic values, fossils, and recreation would affected as discussed in Sections 3.3 – General Vegetation Including Noxious and

Invasive Weeds, 3.4 – Special Status Plants, 3.6 – Cultural Resources, 3.7 – Visual Resources, 3.12 – Recreation, and 3.13 - Lands with Wilderness Characteristics.

3.15 Water Quality

3.15.1 Affected Environment –Water Quality

The analysis area for water is the same as the proposed project area because surface disturbing activities would occur within this area. The proposed project area contains or is bordered by approximately 323 miles of perennial streams; 275 miles in Idaho and 48 miles in Oregon. Of the 323 miles of perennial streams, 134 miles are within the Soda Fire burned area and 189 miles are outside the fire perimeter. Perennial streams flow continuously and are generally associated with a water table in the localities through which they flow (USDI BLM 1998).

The proposed project area contains or is bordered by approximately 1,798 miles of intermittent streams; 1,126 miles in Idaho and 672 miles in Oregon. Of the 1,798 miles of intermittent streams, 856 miles are within the Soda Fire burned area and 942 miles are outside the fire perimeter. Intermittent or seasonal streams flow only at certain times of the year, when they receive water from springs or some surface source such as melting snow (USDI BLM 1998).

Ephemeral streams flow only in direct response to precipitation. Ephemeral stream channels are above the water table at all times (USDI BLM 1998). Ephemeral stream channels are common throughout the proposed project area. Due to lack of consistent water and depth to the water table, riparian vegetation is not present.

The proposed project area contains approximately 39 miles of artificial water bodies such as canals, approximately 5 miles of artificial water bodies are within the Soda Fire burned area and 34 miles are outside the fire perimeter (NHD 2010; USDI BLM 2015a).

The proposed project area includes a portion of the Reynolds Creek Experimental Watershed (RCEW) maintained by the USDA Agricultural Research Service (ARS).

Water resources in the area primarily contribute to irrigation, livestock production, fisheries, recreation, and wildlife habitat.

3.15.2 Environmental Consequences –Water Quality

3.15.2.1 Alternative 1 – No Action

No treatments would occur under this alternative to reduce the scale of wildfire within the proposed project area. As a result, large or frequent wildland fires would continue to occur, removing protective vegetation and have the potential to reduce soil stability increasing erodibility leading to deposition in water ways impacting water quality.

Indirect impacts would be the continued potential for increased sediment deposition into water bodies within the proposed project area due to vegetation removal by wildfires. This is expected to continue until natural vegetation recovery and/or post-fire seeding establishment is adequate to prevent soil movement by wind or water. In some cases, additional post-fire soil stabilization treatments may be necessary to prevent water quality degradation, particularly in perennial streams. Sediment deposition is expected to occur primarily during precipitation events and spring run-off, but could also result from wind deposition during dry periods. Over the long term, these impacts are expected to repeat throughout the proposed project area due to frequent, potentially large fires, as demonstrated by the fire history of the area.

3.15.2.2 General Effects of Action Alternatives

All action alternatives include the design features to buffer perennial and intermittent streams, riparian areas, and wetlands that occur within or adjacent to the proposed fuel break segments (see Section 2.4.4 Design Features). This would reduce or eliminate direct sediment deposition into these areas due to treatment implementation. However, implementation of an action alternative could result in short-term increases in ash and sediment deposition, primarily into streams lacking riparian vegetation or ephemeral drainages within or adjacent to treated fuel breaks. Ash would be produced as a result of burning vegetation and litter using prescribed fire. Soil sediment would be produced as a result of vegetation removal, mechanical treatments, and targeted grazing. Sediment and ash could be transported by either wind or water. This could result in short-term increases in sedimentation that could reduce water quality. This effect is expected to last from project implementation until seeding establishment is adequate to prevent soil movement. Short-term impacts to water quality due to sedimentation would be greater in the burned area than the unburned area due to lack of established vegetation to filter sediment.

Over the long term, implementation of an action alternative is expected to reduce water quality impacts as a result of reduced wildfire size within both burned and unburned portions of the proposed project area.

3.15.2.3 Alternative 2 – Proposed Action

Short-term effects of the Proposed Action on water quality would occur due to vegetation removal, mechanical treatments, road and ditch maintenance, and biological thinning. While riparian and aquatic buffers will be implemented to avoid disturbing riparian vegetation during creation of fuel breaks, and BMPs and conservation practices will minimize sediment discharge into streams and wetlands, road maintenance under the Proposed Action will occur within riparian areas.

There would be a total of 812 crossings of intermittent and perennial streams, 407 in the burned area and 405 outside the Soda Fire perimeter by roads that are proposed for maintenance and improvement. Maintenance of fuel breaks are not anticipated to result in increased sedimentation. Installation of culverts and construction of rolling dip gravel stream crossings would have the potential to result in temporary disturbance to streamside vegetation and increase sedimentation which would have a short-term impact on water quality.

Over the long-term, implementation of the Proposed Action is expected to reduce water quality impacts due to reduced wildfire size. Maintenance and improvement of roads and ditches with improved stream crossings and culverts would improve water quality due to improved sediment management in both the burned and unburned portions of the proposed project area.

3.15.2.4 Alternative 3 – Modified Proposed Action

General direct and indirect effects related to vegetated fuel breaks and targeted grazing would be similar to those described above. Short-term effects of Alternative 3 on water quality would be less in geographic extent than Alternative 2, due to over 50 percent fewer acres of vegetation removal, mechanical treatments, biological thinning as well as the result of not maintaining or improving roads. There would be a total of 673 crossings of intermittent and perennial streams, 323 in the burned area and 350 outside the Soda Fire perimeter by roads; however these roads are not proposed for maintenance and improvement under this alternative.

Over the long term, implementation of Alternative 3 is expected to reduce water quality impacts due to reduced wildfire over less of a geographic area compared to the Proposed Action. This is due to the decreased acreage of the fuel break segments and the result of not maintaining or improving the roads which would decrease the fuel break effectiveness compared to the Proposed Action.

3.15.3 Cumulative Effects –Water Quality

The cumulative impacts analysis area for water quality is the proposed project area including a 0.25 mile buffer. Water quality is affected by human uses on federal, state, and private lands in and adjacent to the proposed project area. Actions that could cumulatively affect water quality are treatments in the Soda Fire ESR Plan, noxious weed management, the proposed Gateway West and Boardman to Hemingway transmission line projects; ongoing livestock grazing; ongoing recreation and ongoing wildfire. Human uses can also include alteration of stream flows on non-federal lands. Past and current alterations contribute to the baseline condition and may influence the duration of stream flow on public lands.

The Clean Water Act requires that permitted activities not contribute to water quality impairment. This is achieved via design features associated with these projects to reduce or eliminate deposition of sediment or pollutants or vegetation removal that could contribute to increased water temperatures.

Vegetation treatments that result in removal of upland cover, such as past plow-and-seed or prescribed fires to remove shrubs, may have resulted in sediment deposition into perennial, intermittent, or ephemeral drainages lasting several months to a year or more. Noxious weed treatments along drainages could also result in short-term sediment deposition through small-scale vegetation removal. Sediment deposition slows with reestablishment of perennial vegetation through seeding or planting. In particular, post-fire ESR treatments that include grass and forb seeding to stabilize soils and reestablishment of upland and/or riparian shrubs through seeding or planting would gradually slow sediment deposition. In addition, reestablishment of streamside cover would increase shading and decrease water temperatures. Establishment of structures to slow or stop soil erosion in vulnerable areas post-fire would have a more rapid effect.

The Gateway West and Boardman to Hemingway transmission line projects could potentially effect water quality through sedimentation. The exact locations are still to be determined. Effects on water quality from this project could include vegetation removal and potential sedimentation due to construction activities. When routes are determined, the anticipated direct, indirect, and cumulative impacts of the project will be disclosed. Past, present, and future maintenance of utility lines results in some small-scale vegetation disturbance or removal along access routes and around poles that could result in some localized erosion and sediment deposition. Current and future maintenance activities are subject to restrictions to reduce the potential for adverse effects to water quality.

Ongoing livestock use within riparian areas, either as permitted grazing or trailing, can have impacts to water quality. Livestock use can result in soil compaction and loss of vegetation cover on both upland and riparian sites. This can accelerate surface erosion and increase the amount of fine sediment and nutrients introduced to streams. Fecal wastes can be introduced to streams as a result of direct deposition or erosion from adjacent areas. This can result in increased bacterial concentrations in streams. Terms and conditions on livestock grazing and crossing permits are expected to limit livestock access in areas vulnerable to water quality degradation. This, coupled with buffers and exclosures placed on fuel break segments for perennial streams, riparian areas, and wetlands, is expected to reduce the potential for cumulative impacts related to livestock use.

Range improvements occur on lands throughout the proposed project area and include livestock watering troughs, pipelines, wells, and fences constructed of various materials. Concentrated livestock use reduces vegetation cover and causes compaction within close proximity of troughs and mineral supplement sites, causing these areas to be susceptible to erosion. One to two acres surrounding these sites would likely have increased bare ground and sediment movement by wind or water. This could result in some minor contributions to sediment in water. However, range improvements can also be used to divert grazing from vulnerable areas and reduce impacts to streams. Thus, range improvements and proactive grazing management could reduce the potential for water quality degradation.

All recreational travel in Owyhee County is restricted to existing roads and trails. Recreational travel in Malheur resource area has both limited and open use for OHVs. This results in less potential for OHV impacts that result in damage to stream banks and drainage beds. Travel management can also enhance fire management by improving roads for reduced response time and reducing the potential for unintentional starts resulting from cross-country travel. This would also result in fewer fire-related impacts to water quality.

Past, present, and foreseeable future actions within the project area would continue to have impacts to water quality through soil disturbance. The action alternatives would only slightly increase the cumulative impacts to water quality while providing treatments to reduce the long-term effects of erosion and sedimentation from large burned areas on the landscape from frequent wildland fire.

4.0 Consultation and Coordination

4.1 List of Preparers

This section contains the list of preparers and contributors for this Draft EA.

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4.2 Cooperating Agencies

BLM is actively coordinating on this project with U.S. Fish and Wildlife Service, a cooperating agency.

4.3 Agencies, Organizations, Tribes, and Individuals Consulted

4.3.1 Tribal Consultation

BLM is required to consult with Native American tribes to "help assure (1) that federally recognized tribal governments and Native American individuals, whose traditional uses of public land might be affected by a proposed action, will have sufficient opportunity to contribute to the decision, and (2) that the decision maker will give tribal concerns proper consideration" (U.S. Department of the Interior, BLM Manual Handbook H-8120-1). Tribal coordination and consultation responsibilities are implemented under laws and executive orders that are specific to cultural resources which are referred to as "cultural resource authorities," and under regulations that are not specific which are termed "general authorities." Cultural resource authorities include: the National Historic Preservation Act of 1966, as amended (NHPA); the Archaeological Resources Protection Act of 1979 (ARPA); and the Native American Graves Protection and Repatriation Act of 1990, as amended (NAGPRA). General authorities include: the American Indian Religious Freedom Act of 1979 (AIRFA); the National Environmental Policy Act of 1969 (NEPA); the Federal Land Policy and Management Act of 1976 (FLPMA); and Executive Order 13007-Indian Sacred Sites. The proposed action is in compliance with the aforementioned authorities.

Southwest Idaho is the homeland of two culturally and linguistically related tribes: the Northern Shoshone and the Northern Paiute. In the latter half of the 19th century, a reservation was established at Duck Valley on the Nevada/Idaho border west of the Bruneau River. The Shoshone-Paiute Tribes residing on the Duck Valley Reservation today actively practice their culture and retain aboriginal rights and/or interests in this area. The Shoshone-Paiute Tribes assert aboriginal rights to their traditional homelands as their treaties with the United States, the Boise Valley Treaty of 1864 and the Bruneau Valley Treaty of 1866, which would have extinguished aboriginal title to the lands now federally administered, were never ratified.

Other tribes that have ties to southwest Idaho include the Bannock Tribe and the Nez Perce Tribe. Southeast Idaho is the homeland of the Northern Shoshone Tribe and the Bannock Tribe. In 1867, a reservation was established at Fort Hall in southeastern Idaho. The Fort Bridger Treaty of 1868 applies to BLM's relationship with the Shoshone-Bannock Tribes. The northern part of the BLM Boise District was also inhabited by the Nez Perce Tribe. The Nez Perce signed treaties in 1855, 1863 and 1868. BLM considers off-reservation treaty-reserved fishing, hunting, gathering, and similar rights of access and resource use on the public lands it administers for all tribes that may be affected by a proposed action.

Consultation and Coordination with the Shoshone-Paiute Tribes occurred on February 18, 2016, March 17, 2016, and April 21, 2016 at the Wings and Roots Campfire Meetings. A specific alternative without road and ditch maintenance and improvement was developed as a result of this process.

4.3.2 Other State and Local Agencies

Boise District Resource Advisory Council

Idaho Department of Fish and Game

5.0 Literature Cited

Asher, J.E., and R.E. Eckert. 1973. Development, testing, and evaluation of the deep furrow drill arm assembly for the rangeland drill. *Journal of Rangeland Management*, 26(5):377-379.

ASI. 2006. American Sheep Industry. Launchbaugh, Karen and John Walker. 2006. Chapter 1: Targeted grazing – a new paradigm for livestock management. In Targeted Grazing: A Natural Approach to Vegetation Management and Landscape Enhancement. Karen Launchbaugh (ed.). American Sheep Industry Assoc. 199 pp. Available at: http://www.inwoodlands.org/a-new-old-tool-for-battlingin/#sthash.KAyIwmQJ.dpuf.

Baker, W.L. 2011. Pre-EuroAmerican and recent fire in sagebrush ecosystems. Pp 185-201 *in* S. T. Knick and J. W. Connelly (Editors). Greater Sage-grouse: Ecology and Conservation of a Landscape Species and Its Habitats. *Studies in Avian Biology* (Vol.38), University of California Press, Berkeley, CA.

Balch, J.K., B.A. Bradley, C.M. D'Antonio*, and* J. Gómez-Dans*.* 2013*.* Introduced annual grass increases regional fire activity across the arid western USA (1980–2009*)*. Global Change Biology. *19*:*173–183*.

Benton, R. and J. Reardon. 2006. Fossils and Fire: A Study on the Effects of Fire on Paleontological Resources at Badlands National Park, In Fossils from Federal Lands, New Mexico Museum of Natural History and Science Bulletin 34.

Blauer, A.C., E.D. McArthur, R. Stevens, and S.D. Nelson. 1993. Evaluation of roadside stabilization and beautification plantings in south-central Utah. USDA-FS, Research Paper INT-462, Ogden, UT, 65 pp.

Braswell, K. 1986. History of Eagle Valley, Baker County, Oregon. Electronic Document, http://www.oregongenealogy.com/baker/historybc/eaglevalley.htm, accessed September 2011.

Burritt, B., and R. Frost. 2006. Animal behavior principles and practices. *In* Targeted Grazing: a natural approach to vegetation management and landscape enhancement – Chapter 2, *Ed.* Karen Launchbaugh. *American Sheep Industry Association*, Cottrell Printing, Centennial CO.

Connelly, J.W., S.T. Knick, M.A. Schroeder, and S.J. Stiver. 2004. Conservation assessment of greater sage-grouse and sagebrush habitats. Unpublished report, Western Association of Fish and Wildlife Agencies, Cheyenne, WY.

Cox, M. 2008. 2007-2008 big game status. Federal Aid in Wildlife Restoration, W-48-R-39, Subgrant II, Nevada Department of Wildlife, Reno, USA.

Cox, R.D., and V.J. Anderson. 2004. Increasing native diversity of cheatgrass-dominated rangeland through assisted succession. *Journal of Rangeland Management*, 57:203-210.

Davies, K.W., and T.J. Svejcar. 2008. Comparison of medusahead-invaded and non-invaded Wyoming big sagebrush steppe in Southeastern Oregon. Rangeland Ecology and Management. 61:623-629.

Davies, K.W., C.S. Boyd, J.L. Back, J.D. Bated, T.J. Svejcar, and M.A. Gregg. 2011. Saving the sagebrush sea: An ecosystem conservation plan for big sagebrush plant communities. Biological Conservation 144:2573-2584.

Davies, K.W., J.D. Bates, and A.M. Nafus. 2011. Are there benefits to mowing Wyoming big sagebrush plant communities? An evaluation in southeastern Oregon. Environmental Management. 48:539-546.

Davies, K.W., and R.L. Sheley. 2011. Promoting native vegetation and diversity in exotic annual grass infestations. *Restore. Ecology* 19(2):159-165.

Diamond, J.M., C.A. Call, and N. Devoe. 2012. Effects of targeted grazing and prescribed burning on community and seed dynamics of a downy brome (*Bromus tectorum*) – dominated landscape. *Invasive Plant Science and Management*, 5(2): 259-269.

Engle, J.C., and J.C. Munger. 2003. Population fragmentation of spotted frogs in the Owyhee Mountains. IDFG.

Evans, John W. 1991. *Powerful Rocky: The Blue Mountains and the Oregon Trail*. Eastern Oregon State College, La Grande.

Finnerty D.W., and D.L. Klingman. 1962. Life cycles and control studies of some weed brome grasses. *Weeds*, 10:40-47.

Garton, E.O., J.W. Connelly, J.S. Horne, C.A. Hagen, A. Moser, M.A. Schroeder. 2011. Greater sage-grouse population dynamics and probability of persistence. In S. T. Knick, & J. W. Connelley (Eds.), Greater Sage-grouse: ecology and conservation of a landscape species and its habitats (Vol. Studies in Avian Biology 38, pp. 293-381). Berkeley, California: University of California Press.

Gray, E.C. 2011. An Evaluation of the Invasion Potential of *Kochia prostrata* (prostrate kochia) in Southwestern Idaho, USA. M.S. thesis. Oregon State University, Corvallis, Oregon.

Gray, E.C., and P.S. Muir. 2013. Does *Kochia prostrata* spread from seeded sites? An evaluation from southwestern Idaho, USA. *Rangeland Ecology and Management*, 66(2):191-203.

Harrison, R.D., B.L. Waldron, K.B. Jensen, R.J. Page, T.A. Monaco, W.H. Horton, and A.J. Palazzo. 2002. Forage kochia helps fight range fires. *Rangelands*, 24: 3-7.

Hagwood, S. 2006. Field Guide to the Special Status Plants of the Bureau of Land Management Twin Falls District, Jarbidge Field Office Area. BLM Idaho Technical Bulletin 2006-01. June 2006. Available at: http://www.blm.gov/style/medialib/blm/id/publications/technical_bulletins.Par.98306.File.dat/tb06-01.pdf

Hanser, S. E., & Knick, S. T. 2011. Greater sage-grouse as an umbrella species for shrubland passerine birds: a multiscale assessment. In S. T. Knick, & J. W. Connelley (Eds.), Greater Sage-grouse: ecology and conservation of a landscape species and its habitats (*Studies in Avian Biology* (Vol.38), pp. 475-487). Berkeley, California: University of California Press.

Harrison, R.D., N.J. Chatterton, B.L. Waldron, B.W. Davenport, A.J. Palazzo, W.H. Horton, and K.H. Asay. 2000. Forage kochia: its compatibility and potential aggressiveness on intermountain rangelands. Logan, UT, USA: Utah State University. Utah Agricultural Experiment Station Research Report 162. 66 p.

Harrison, R.D., B.L. Waldron, K.B. Jensen, R.J. Page, T.A. Monaco, W.H. Horton, and A.J. Palazzo. 2002. Forage kochia helps fight range fires. *Rangelands*, 24: 3-7.

Hendrickson, J., and B. Olson. 2006. Understanding plant response to grazing – Chapter 4, *In* Targeted Grazing: a natural approach to vegetation management and landscape enhancement – Chapter 2, *Ed.* Karen Launchbaugh. *American Sheep Industry Association*, Cottrell Printing, Centennial CO.

Holloran, M.J., and S.H. Anderson. 2005. Spatial Distribution of Greater Sage-Grouse Nests in Relatively Contiguous Sagebrush Habitats. *Condor*, 107: 742–52.

Hutchinson, Daniel J., and Larry R. Jones (eds.). 1993. *Emigrant Trails of Southern Idaho*. Adventures in the Past—Idaho Cultural Resource Series Number 1. Idaho Bureau of Land Management and Idaho State Historical Society, Boise, Idaho.

IDFG (Idaho Fish and Game). 2005. Inland Redband Trout *Oncorhynchus mykiss gairdneri*. Species Report.

IDFG. 2009. Columbia spotted frog Great Basin population (Owyhee subpopulation) long-term monitoring plan: year 2009 results. Threatened and endangered species project E-26-6 final and E-26-7 interim section 6, Endangered Species Act, Progress Report, Boise, ID.

IDFG. 2010. Idaho Bighorn Sheep Management Plan 2010. Boise, ID. Retrieved from http://fishandgame.idaho.gov/public/wildlife/planBighorn.pdf

IDFG. 2013a. Pronghorn, 2013 Statewide Report. Study I, Job 7. July 1, 2012 to June 30, 2013. Boise, ID.

IDFG. 2013b. Bighorn Sheep, 2013 Statewide Report. Study I, Job 4. July 1, 2012 to June 30, 2013. Boise, ID.

IDFG. 2016. Rare Plant GeoDatabase. January 2016 Data Export.

ISDA (Idaho State Department of Agriculture). 2016. Idaho’s 67 Noxious Weeds. Accessed April 2016 from http://www.agri.idaho.gov/AGRI/Categories/PlantsInsects/NoxiousWeeds/watchlist.php

James, L. J. Evans, M. Ralphs, and R. Child, editors. 1991. Noxious Range Weeds. Westview Press. Boulder CO.

Knick, S. T. and S. E. Hanser. 2011. Connecting Pattern and Process in Greater Sage-grouse Populations and Sagebrush Landscapes. Pp. 383-406 *in* S. T. Knick and J. W. Connelly (Editors). Greater Sage-grouse: Ecology and Conservation of a Landscape Species and Its Habitats. *Studies in Avian Biology* (Vol.38), University of California Press, Berkeley, CA.

Knick, S. T., S. E. Hanser, and K. L. Preston. 2013. Modeling ecological minimum requirements for distribution of greater sage-grouse leks: implications for population connectivity across their western range, U.S.A.: Ecology and Evolution.

Kochert, M. N., K. Steenhof, L. B. Carpenter, and J. M. Marzluff. 1999. Effects of fire on Golden Eagle territory occupancy and reproductive success. Journal of Wildlife Management 63:773- 780.

Lyon, A. G., and S. H. Anderson. 2003, Potential Gas Development Impacts on Sage Grouse Nest Initiation and Movement. Wildlife Society Bulletin, v. 31, p. 486–91.

Manier, D.J., Bowen, Z.H., Brooks, M.L., Casazza, M.L., Coates, P.S., Deibert, P.A., Hanser, S.E., and Johnson, D.H. 2014. Conservation buffer distance estimates for Greater Sage-Grouse—A review: U.S. Geological Survey Open-File Report 2014–1239, 14 p., http://dx.doi.org/10.3133/ofr20141239.

Marzluff, J. M., S. T. Knick, M. S. Vekasy, L. S. Schueck, and T. J. Zarriello. 1997. Spatial Use and Habitat Selection of Golden Eagle in Southwestern Idaho.

McArthur, E.D., A.C. Blauer, and R. Stevens. 1990. Forage kochia competition with cheatgrass in central Utah. *In* Proceedings – Symposium on cheatgrass invasion, shrub die-off, and other aspects of shrub biology and management. April 5-9 1989, Las Vegas, NV, Ogden, UT. US Department Agriculture Forest Service, Intermountain Research Station, 56-65p.

Meinig, Donald W. 1968. *The Great Columbia Plain: A Historical Geography 1805-1910*. University of Washington Press, Seattle. Reprinted in 1995.

Miller, R.F., S.T. Knick, D.A. Pyke, C.W. Meinke, S.E. Hanser, M.J. Wisdom, and A.L. Hild. 2011. Characteristics of sagebrush habitats and key limitations to long term conservation. Pp. 145-184 *in* S. T. Knick and J. W. Connelly (Editors). Greater Sage-grouse: Ecology and Conservation of a Landscape Species and Its Habitats. *Studies in Avian Biology* (Vol.38), University of California Press, Berkeley, CA

Mills, L. S. 2007. Bridging applied population and ecosystem ecology with focal species concepts. In Conservation of wildlife populations (pp. 276-285). Oxford, United Kingdom: Blackwell Publishing.

Monaco, T.A., B.L. Waldron, R.L. Newhall, and W.H. Horton. 2003. Re-establishing perennial vegetation in cheatgrass monocultures. *Rangelands*, 25(2): 26-29.

Monsen, S. B. 1994. Selection of plants for fire suppression on semiarid sites. p. 363-373. In: S.B.

Monsen, S.B. and K.L. Memmott. 1999. “Comparison of burning reliance of forage kochia, crested wheatgrass, bluebunch wheatgrass, small burnet, and western yarrow in simulated burned greenstrips”. p. 113-122. In: Cooperative research studies 1989-1998. USDA Forest Service, Rocky Mountain Research Station, Shrub Sciences Lab., Provo, UT. Report submitted to U.S. Dept. of Interior, Intermountain Greenstripping Program. Boise, ID. 285 p.

Murphy, Robert F., and Yolanda Murphy. 1986. Northern Shoshone and Bannock. In *Great Basin*, edited by Warren L. d’Azevedo, Vol. 11 of the *Handbook of North American Indians*, Wiliam C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Murray R.B. 1971. Grazing capacity, sheep gains: cheatgrass, bunchgrass ranges in southern Idaho. *Journal of Rangeland Management*, 24:407-409.

National Centers for Environmental Information (NCEI), National Oceanic and Atmospheric Administration (NOAA). 2016. Monthly Climatological Summary. Available online: https://gis.ncdc.noaa.gov/maps/ncei/cdo/monthly.

National Wildfire Coordinating Group (NWCG) 2015. Glossary of Wildfire Terminology. PMS 205. May, 2011. Available online at: http://www.nwcg.gov/glossary/a-z

NatureServe. 2004. A Habitat-Based Strategy for Delimiting Plant Element Occurrences: Guidance from the 2004 Working Group. 15 pp. Available online at: http://www.natureserve.org/library/deliminting_plant_eos_Oct_2004.pdf

NHD (National Hydrological Dataset). 2010. Available online at http://nhd.usgs.gov/data.html

NWCG. 2007. Intermediate Wildland Fire Behavior S-290 Instructor Guide November 2007 NFES 2890. November 2007.

Nyamai, P.A., T.S. Prather, and J.M. Wallace. 2011. Evaluating restoration methods across a range of plant communities dominated by invasive annual grasses to native perennial grasses. *Invasive Plant Science and Management*, 4(3):306-316.

ODA (Oregon Department of Agriculture). 2015. Noxious Weed Policy and Classification System. Noxious Weed Control Program. Accessed April 2016 from http://www.oregon.gov/ODA/shared/Documents/Publications/Weeds/NoxiousWeedPolicyClassification.pdf

ODFW (Oregon Department of Fish and Wildlife). 2003. Oregon’s bighorn sheep and Rocky Mountain goat management plan. Salem, Oregon, USA.

ODFW. 2012. Mitigation Framework for Sage-Grouse Habitats. March 20, 2012.

ONDA (Oregon Natural Desert Association). 2004. Wilderness Inventory Recommendations.

ORBIC (Oregon Biodiversity Information Center). 2015. Rare, Threatened, and Endangered Species GeoDatabase. Provided by BLM March 31, 2016.

OSWRB (Oregon State Water Resources Board) and SCS (Soil Conservation Service). 1969. Oregon's Long-Range Requirements for Water General Soil information.

Pagel, J.E., D.M. Whittington, and G.T. Allen. 2010. Interim Golden Eagle technical guidance: inventory and monitoring protocols; and other recommendations in support of eagle management and permit issuance. Division of Migratory Bird Management, U.S. Fish and Wildlife Service.

Pellant, M. 1992. History and applications of the Intermountain Greenstripping Program. In: Monsen, Stephen B.; Kitchen, Stanley G., comps. 1994. Proceedings--ecology and management of annual rangelands; 1992, May 18-22; Boise ID, Gen. Tech. Rep. INTGTR- 313. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 63-68.

Peterson, Pam, editor. 2001. Biological soil crusts: ecology and management. Washington, DC, USA: US Department of the Interior, Bureau of Land Management, National Science and Technology Center, Information and Communications Group.

Sands, A. R., S. Sather-Blair, and V. Saab. 2000. Sagebrush steppe wildlife: historical and current perspectives. Pages 27–34 in P. G. Entwistle, A. M. DeBolt, J. H. Kaltenecker, and K. Steenhof, compilers. Proceedings—Sagebrush Steppe Ecosystems Symposium. Bureau of Land Management Publication No. BLM/ID/PT-001001+1150, Boise, Idaho, USA.

Schauer, C.S., D.W. Bohnert, M.F. Carpinelli, and S.J. Falck. 2004 Nutritional and Seed Responses of Forage Kochia to Ruminal Incubation. *Rangelands* 26(1): 8-11.

Schwantes, C.A. 1991. *In Mountain Shadows: A History of Idaho*. University of Nebraska Press, Lincoln.

Sheley, R. and J. Petroff, eds. 1999. Biology and Management of Noxious Rangeland Weeds. Corvallis, OR: Oregon State University Press.

Sheley, R., J. Petroff, and M. Borman, 1999. Introduction to Biology and Management of Noxious Rangeland Weeds, Corvalis, OR.

Sheley, R.L., J.S. Jacobs, and T.J. Svejcar. 2005. Integrating disturbance and colonization during rehabilitation of invasive weed dominated grasslands. *Weed Science* 53(3):307-314.

Scott, Joe H. and Burgan, Robert E. 2005. Standard fire behavior fuel models: a comprehensive set for use with Rothermel's surface fire spread model. Gen. Tech. Rep. RMRS-GTR-153. Fort Collins, CO. USFS

Stiver, S. J., Apa, A. D., Bohne, J. R., Bunnell, S. D., Deibert, P. A., Gardner, S. C., . . . Schroeder, M. A. 2006. Greater sage-grouse comprehensive conservation strategy.

Unpublished Report, Western Association of Fish and Wildlife Agencies, Cheyenne, WY.

St John and Ogle. 2009. Green strips or vegetative fuel breaks. Tech. Note TN Plant Materials No. 16. Boise, ID; Salt Lake City, UT: U.S. Department of Agriculture, Natural Resources Conservation Service. 16 p.

Sullivan, A.T., V.J. Anderson, R.F. A. 2013. *Kochia prostrata* establishment with pre-seeding disturbance in three plant communities. *International Research Journal of Agricultural Science and Soil Science* 3(10): 353-361.

Tait, C. K., and Vetter, R. 2008. Potential effects of livestock grazing on Columbia spotted frogs (rana luteiventris) and management recommendations. USDA USFS and USDI BLM.

Tilley, D., Ogle, D., St. John, L. Waldron, B.L., and R.D. Harrison. 2012. Plant Guide for forage kochia (Bassia prostrata). USDA-Natural Resources Conservation Service, Aberdeen Plant Materials Center. Aberdeen, Idaho 83210.

Tuason, T. 2005. 1987-2004 Monitoring results of *Lepidium davisii* in the Mountain Home District. USDI BLM Boise District, Boise, ID, USA.USDA Natural Resources Conservation Service (NRCS). 2015. Soil Survey Geographic (SSURGO) database for Owyhee County Area, Idaho. Available online: http://websoilsurvey.nrcs.usda.gov.

USDA USFS (U.S. Department of Agriculture Forest Service). 2011a. How to Generate and Interpret Fire Characteristics Charts for Surface and Crown Fire Behavior. Available online: http://www.fs.fed.us/rm/pubs/rmrs_gtr253.pdf.

USDA USFS 2011b. Synthesis of Knowledge of Extreme Fire Behavior: Volume I for Fire Managers. Available online: http://www.fs.fed.us/pnw/pubs/pnw_gtr854.pdf.

USDA NRCS (U.S. Department of Agriculture, National Resources Conservation Service). 2016. Updated T and K Factors Questions & Answers. Available online: http://www.nrcs.usda.gov/wps/PA_NRCSConsumption/download?cid=stelprdb1262856&ext=pdf.

USDI BLM (U.S. Department of the Interior, Bureau of Land Management). 1998. Riparian Area Management. Technical Reference 1737-15. U.S. Department of the Interior, Bureau of Land Management, National Applied Resource Sciences Center, Denver, CO. 126 pp.

USDI BLM. 1999. Owyhee Resource Management Plan. Boise Field Office. Available online: https://eplanning.blm.gov/epl-front-office/projects/lup/35607/41983/44484/Owyhee_RMP_ROD_1999.pdf

USDI BLM. 1999. Utilization Studies and Residual Measurements. Interagency Technical Reference 1734-3. USDI Bureau of Land Management. National Business Center. Denver, CO.

USDI BLM. 2000. Field Guide to the Special Status Plants of the Bureau of Land Management Lower Snake River District. April 2000. Available at: http://www.blm.gov/style/medialib/blm/id/botany/special_status_plants.Par.57127.File.dat/SpecialStatusPlants_BLMID_BOI_AtwoodDeBolt_2000.pdfUSDI BLM. 2002. Southeastern Oregon Resource Management Plan Record of Decision. Vale District. Available online: http://www.blm.gov/or/districts/vale/plans/seormp.php.

USDI BLM. 2007a. Vegetation Treatments Using Herbicides on Bureau of Land Management Land Lands in 17 Western States Programmatic Environmental Impact Statement. Volume 1: Abstract, Executive Summary, and Chapters 1 through 8.

USDI BLM. 2011a. Boise District Fire Management Plan.

USDI BLM 2011b. USDI BLM. 2011b. 6301- Wilderness Characteristics Inventory (Public). Available online: http://www.blm.gov/style/medialib/blm/wo/Information_Resources_Management/policy/blm_manual.Par.34706.File.dat/6301.pdf.

USDI BLM. 2012. National Invasive Species Information Management System (NISIMS) Weed Infestations. GIS data. Received from BLM April 2016.

USDI BLM. 2013. BLM OR Fire History Polygon (GIS data). Published August 23, 2013. Available at: http://www.blm.gov/or/gis/metadata.php?id=463. Downloaded April 2016.

USDI BLM. 2014. 2007 Vegetation Treatments Using Herbicides on BLM Lands in the 17 Western States Programmatic EIS (PEIS) and Herbicides Approved for Use on BLM Lands in Accordance with the 17 PEIS ROD. Available online: http://www.blm.gov/wo/st/en/prog/more/veg_eis.html

USDI BLM. 2015a. BLM Idaho Post-Fire Recovery Plan Emergency Stabilization and Burned Area Rehabilitation 2015 Plan (Soda Fire ESR Plan). U.S. Department of the Interior, Bureau of Land Management, BLM Boise District/Owyhee Field Office, BLM Vale District/Malheur Field Office, Idaho State Office/Oregon State Office. 71 pp.

USDI BLM. 2015b. Vale District Fire Management Plan.

USDI BLM. 2015c. GeoBOB database for Oregon. Database provided BLM April 2015.

USDI BLM. 2015d. Fire Perimeters Historic (Polygon) GIS data for Idaho.

USDI BLM. 2015e. Fire Perimeters Current Year (Polygon) GIS data for Idaho.

USDI BLM. 2015f. Idaho and Southwestern Montana Greater Sage-Grouse Approved Resource Management Plan Amendment. September 2015.

USDI BLM. 2015g. Oregon Greater Sage-Grouse Approved Resource Management Plan Amendment. September 2015.

USDI BLM. 2016. Final PEIS for Vegetation Treatments Using Aminopyralid, Fluroxypyr, and Rimsulfuron on BLM Lands in 17 Western States. January 2016. Available online: http://www.blm.gov/style/medialib/blm/wo/Planning_and_Renewable_Resources/vegeis.Par.86275.File.dat/Report%20Cover%20and%20Spine%20Final%20EIS%20Three%20Herbicides.pdf

USDI USFWS (U.S. Department of the Interior, Fish and Wildlife Service). 2008. Birds of Conservation Concern 2008. United States Department of the Interior, Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, Virginia. 85 pp.

USDI USFWS. 2013a. Greater Sage-grouse (Centrocercus urophasianus) Conservation Objectives: Final Report. U.S. Fish and Wildlife Service, Denver, CO. February 2013.

USDI USFWS. 2013b. Great Basin redband trout (Oncorhychus mykiss gibbsi) Species Fact Sheet. Retrieved from Oregon Fish and Wildlife Office Endangered Species Data: http://www.fws.gov/oregonfwo/Species/Data/GreatBasinRedbandTrout/

U.S. Environmental Protection Agency. 2011. Level III and IV ecoregions of the continental United States. U.S. EPA, National Health and Environmental Effects Research Laboratory, Corvallis, Oregon, Map scale 1:3,000,000. Available online at: http://www.epa.gov/wed/pages/ecoregions/level_iii_iv.htm.

USGS LANDFIRE (U.S. Geological Survey LANDFIRE). 2013. Existing Vegetation Type layer. Last updated June 2013. Available at: http://landfire.cr.usgs.gov/viewer/. Accessed April 2016.Waldron, B.L., J.S. Eun, D.R. ZoBell, and K.C. Olson. 2010. Prostrate kochia (*Kochia prostrata*) for fall and winter grazing. Small Ruminant Research 91: 47-55.

Waldron, B.L., R.D. Harrison, N.J. Chatterton, B.W. Davenport. Forage Kochia: Friend or Foe In: McArthur, E. Durant; Fairbanks, Daniel J., comps. 2001. Shrubland ecosystem genetics and biodiversity: proceedings; 2000 June 13–15; Provo, UT. Proc. RMRS-P-21. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

Waldron, B.L., R.D. Harrison, N.J. Chatterton, B.W. Davenport. Forage Kochia: Friend or Foe In: McArthur, E. Durant; Fairbanks, Daniel J., comps. 2001. Shrubland ecosystem genetics and biodiversity: proceedings; 2000 June 13–15; Provo, UT. Proc. RMRS-P-21. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.Western Regional Climate Center (WRCC). 2016. Climatological Data Summaries. Available online: http://www.wrcc.dri.edu/climatedata/climsum/.

Whitson, T.D., L.C. Burrill, S.A. Dewey, D.W. Cudney, B.E. Nelson, R.D. Lee, and R. Parker. 1992 Weeds of the West. The Western Society of Weed Science, Newark, California. 630 p.

Wigglesworth, G. 2012. Group 2 Special Status Plants Specialist Report, Owyhee Field Office. BLM Idaho State Office. December 2012. Available at: https://eplanning.blm.gov/epl-front-office/projects/nepa/24953/45483/49053/SpecialStatusPlantsSpecialistReport.pdf

Yoakum, J. 1980. Habitat Management Guides for the American Pronghorn Antelope. Technical Note 347. U.S. Department of the Interior, Bureau of Land Management. Denver Service Center. Denver, Colorado.

Zahn, S.G. 2015. LANDFIRE: U.S. Geological Survey Fact Sheet 2015-3047, 2 p., http://dx.doi.org/10.3133/fs20153047.

6.0 Appendices

6.1 Appendix A: Applicable management decisions regarding the Idaho & Southwestern Montana Greater Sage-Grouse Approved Resource Management Plan Amendments (ARMPA)/Final EIS and Oregon Greater Sage-Grouse Approved Resource Management Plan Amendment

6.1.1 Applicable management decisions regarding the Oregon Greater Sage-Grouse Approved Resource Management Plan Amendment

- **Goal SSS 1:** Conserve, enhance, and restore the sagebrush ecosystem upon which greater sage-grouse (GRSG) populations depend in an effort to maintain and/or increase their abundance and distribution, in cooperation with other conservation partners.
- **MD SSS-9:** Apply buffers and seasonal restrictions in **Table 1** to all occupied or pending leks in PHMA and GHMA to avoid direct disturbance to Greater Sage-grouse. In undertaking BLM management actions, and consistent with valid and existing rights and applicable law in authorizing third-party actions, the BLM will apply the lek buffer-distances identified in the USGS Report Conservation Buffer Distance Estimates for Greater Sage-Grouse—A Review (Open File Report 2014-1239) (Manier et al. 2014).

Table 1. Sage-Grouse Buffers

Resource Program	Activity	Temporal Buffer	Spatial Buffer Miles from Lek	
			PHMA	GHMA
Vegetation - Habitat Restoration MD Veg 3	Sagebrush cutting or removal	Nesting and early brood-rearing (March 1 through June 30)	4	4
Vegetation - Habitat Restoration MD Veg 4	Juniper cutting	Breeding season (March 1 through June 30) - two hours before and after sunrise and sunset.	4	4
Vegetation - Habitat Restoration MD Veg 5	Vegetation management activities that are timing-sensitive for maximum effectiveness	No more than 5 days during the breeding and early brood-rearing period (Mar 1 –June 30; use local information to further refine this period)	4	4
Livestock Grazing and Range Management MD LG 9	Reduce collision risk through fence removal, modification, or marking in areas with "high" collision risk	NA	1.2	1.2

Table 1. Sage-Grouse Buffers				
Resource Program	Activity	Temporal Buffer	Spatial Buffer Miles from Lek	
			PHMA	GHMA
Livestock Grazing and Range Management MD LG 10	Livestock facilities and placement of livestock supplements	NA	1.2	1.2
Travel Management MD TM 8	Upgrading primitive roads	NA	4	4

- ***Goal VEG 1:*** Increase the resistance of Greater Sage-grouse habitat to invasive annual grasses and the resiliency of Greater Sage-grouse habitat to disturbances such as fire and climate change to reduce habitat loss and fragmentation.
- ***Goal VEG 2:*** Within Greater Sage-grouse habitat, re-establish sagebrush cover, native grasses, and forbs in areas where they have been reduced below desired levels or lost. Use ecological site descriptions to determine appropriate levels of sagebrush cover and appropriate native grasses and forbs.
- ***Goal VEG 3:*** Use integrated vegetation management to control, suppress, and eradicate invasive plant species per BLM Handbook H-1740-2. Apply ecologically based invasive plant management principles in developing responses to invasive plant species.
- **Objective VEG 8:** Coordinate vegetation management activities with adjoining landowners.

- **MD SSS-11** Anthropogenic disturbances or activities disruptive to GRSG (including scheduled maintenance activities) shall not occur in seasonal GRSG habitats unless the project plan and NEPA document demonstrate the project will not impair the life-cycle or behavioral needs of GRSG populations. Seasonal avoidance periods vary by GRSG seasonal habitat as follows:

  - In breeding habitat within four (4) miles of occupied and pending leks from March 1 through June 30. Lek hourly restrictions are from two hours before sunset to two hours after sunrise at the perimeter of an occupied or pending lek.
  - Brood-rearing habitat from July 1 to October 31.
  - Winter habitat from November 1 to February 28.

- **MD VEG 9:** When sufficient native plant materials are available, use native plant materials unless the area is immediately threatened by invasive plant species spread or dominance. Use non-native plant materials as necessary to:

  - Limit or control invasive plant species spread or dominance.
  - Create fuel breaks along roads and ROWs.
  - Create defensible space within 0.5 mile of human residences.

- **MD VEG 14:** Allowable methods for vegetation treatment include mechanical, biological (including targeted grazing), chemical, or wildland fire or combinations of these general treatment categories.

- **MD VEG 21:** Allowable methods of invasive plant control include mechanical, chemical, biological (including targeted grazing, biocides, and bio-controls), or prescribed fire or combinations of these methods. Treat areas that contain cheatgrass and other invasive or noxious species to minimize competition and favor establishment of desired species.
- **MD VEG 22:** Use of approved herbicides, biocides, and bio-controls is allowed on all land allocations currently providing or reasonably expected to provide Greater Sage-grouse habitat. Follow the guidance in the 2010 Record of Decision for Vegetation Treatments Using Herbicides on BLM Lands in Oregon and subsequent step-down decision records, when complete, or successor/subsequent decisions governing the use of additional herbicides and biocides.
- **MD VEG 24:** Wash vehicles and equipment used in field operations prior to use in areas without known infestations of invasive plants. Wash vehicles and equipment used in areas with known infestations prior to use in another area to limit the further spread of invasive species to other locations.
- **Objective FIRE 1:** Manage wildland fire and hazardous fuels to protect, enhance, and restore Greater Sage-grouse habitat.
- **MD FIRE 11:** Develop a system of fuel breaks to protect larger intact blocks of Greater Sage-grouse habitat. Locate these fuel breaks along existing roads and ROWs, where possible.
- **MD FIRE 18:** If prescribed fire is used in Greater Sage-grouse habitat, the NEPA analysis for the Burn Plan will address:

    - why alternative techniques were not selected as a viable options;
    - how Greater Sage-grouse goals and objectives would be met by its use;
    - how the COT Report objectives would be addressed and met; and
    - a risk assessment to address how potential threats to Greater Sage-grouse habitat would be minimized.

  Prescribed fire as a vegetation or fuels treatment shall only be considered after the NEPA analysis for the Burn Plan has addressed the four bullets outlined above. Prescribed fire could be used to meet specific fuels objectives that would protect Greater Sage-grouse habitat in PHMA (e.g., creation of fuel breaks that would disrupt the fuel continuity across the landscape in stands where annual invasive grasses are a minor component in the understory, burning slash piles from conifer reduction treatments, used as a component with other treatment methods to combat annual grasses and restore native plant communities).

  Prescribed fire in known winter range shall only be considered after the NEPA analysis for the Burn Plan has addressed the four bullets outlined above. Any prescribed fire in winter habitat would need to be designed to strategically reduce wildfire risk around and/or in the winter range and designed to protect winter range habitat quality.

- **MD TTM 3:** Avoid upgrading existing roads or construction of new roads that are found to contribute to Greater Sage-grouse mortality or lek abandonment.

6.1.2 Conformance with the Idaho & Southwestern Montana Greater Sage-Grouse Approved Resource Management Plan Amendments (ARMPA)

----------------------------------Field Office Section--------------------------------------	
Project Point of Contact: Jeremy Bisson	**Date: April 15, 2016**
Project Name: Soda Fire Fuel Breaks EA	
Project Type: Fuels	
Location: Owyhee and Malheur Field Offices within and around the Soda Fire burned area.	
Which Alternative is Being Evaluated: All action alternatives	
Area of Impact: Owyhee mountains.	
Conservation Area: Idaho West Owyhee Conservation Area	
Habitat Designation: PHMA, IHMA, and GHMA	
Have any Adaptive Management Triggers been engaged:	
Is Project Within SFA: Yes	
Is Project Within a BSU: Yes	
Does the Proposed Project contribute towards the Disturbance Cap: Yes	
Please describe type of disturbance and the expected acres: We will get this from the project scale calculation	
Percent Disturbance within BSU: Current NOC Estimate: West Owyhee Important: 0.4% and West Owyhee Priority: 0.2%	**Percent Disturbance within Project Area:** A preliminary review suggests that the project area is well below the 3% cap. However a more exact calculation of existing disturbance is ongoing and will be part of the final EA.
Allocation: Open	
Please identify the Management Decisions that authorize the proposed project or otherwise appear applicable:	

Management Decision Number	Apply?	Management Decision Text	Conformance Statement.
MD SSS 5	**Yes**	*Prioritize activities and mitigation to conserve, enhance and restore GRSG habitats (i.e., fire suppression activities, fuels management activities, vegetation treatments, invasive species treatments etc.) first by Conservation Area, if appropriate (Conservation Area under adaptive management or at risk of meeting an adaptive management soft or hard trigger), followed by PHMA, then IHMA then GHMA within the Conservation Areas. Local priority areas within these areas will be further refined as a result of completing the GRSG Wildfire and Invasive Species Habitat Assessments as described in* ***Appendix H****. This can include projects outside GRSG habitat when those projects will provide a benefit to GRSG habitat.*	*The current EA proposes treatments which are expected to benefit GRSGs in a priority area to conserve GRSG.*
MD SSS 7		*GRSG habitat within the project area will be assessed during project-level NEPA analysis within the management area designations (PHMA, IHMA, GHMA). Project proposals and their effects will be evaluated based on the habitat and values affected.*	*GRSG Habitat will be included in the Affected Environment and Environmental consequences sections of the EA*
MD SSS 9	**Yes**	*Areas of habitat outside of delineated habitat management areas identified during the Key habitat update process will be evaluated during site specific NEPA for project level activities and GRSG required design features (Appendix C) and buffers (Appendix B) will be included as part of project design. These areas will be further evaluated during plan evaluation and the 5-year update to the management areas, to determine whether they should be included as PHMA, IHMA, or GHMA.*	*Areas of key habitat that are outside of habitat management areas are evaluated in the EA and Appropriate RDFs and Buffers are applied.*
MD SSS 10	**Yes**	*Designate Sagebrush Focal Areas (SFA) as shown on* ***Figure 1-2****. SFA will be managed as PHMA, with the following additional management:* *– Recommended for withdrawal from the General Mining Act of 1872, as amended, subject to valid existing rights.* *– Managed as NSO, without waiver, exception, or modification, for fluid mineral leasing.* *– Prioritized for vegetation management and conservation actions in these areas, including, but not limited to land health assessments, wild horse and burro management actions,*	*Vegetation management is prioritized for the protection of SFA's (keeping fire size down and protecting intact habitat from areas having invasive annuals.* *The project does not occur within an SFA but it does occur in Priority and Important habitat where a habitat trigger has likely been tripped due to the Soda Fire. This project is a priority to protect both unburned habitat and to protect the ongoing ER&R and*

Management Decision Number	Apply?	Management Decision Text	Conformance Statement.
		review of livestock grazing permits/leases, and habitat restoration (see specific management sections).	*restoration treatments within the Soda Fire.*
MDSS 29		*New anthropogenic disturbances within PHMA (Idaho only): Anthropogenic Disturbance Screening Criteria. In order to avoid surface-disturbing activities in PHMA, priority will be given to development (including ROWs, fluid minerals and other mineral resources subject to applicable stipulations) outside of PHMA. When authorizing development in PHMA, priority will be given to development in non-habitat areas first and then in the least suitable habitat for GRSG. In addition to the PHMA and IHMA Anthropogenic Disturbance Development Criteria (MD SSS 30), the following criteria must all be met in the project screening and assessment process:* *a. The population trend for the GRSG within the associated Conservation Area is stable or increasing over a three-year period and the population levels are not currently engaging the adaptive management triggers (this applies strictly to new authorizations; renewals and amendments of existing authorizations will not be subject to this criteria when it can be shown that long-term impacts from those renewals or amendments will be substantially the same as the existing development);* *b. The development with associated mitigation will not result in a net loss of GRSG Key habitat and mitigation will provide a net conservation benefit to the respective PHMA;* *c. The project and associated impacts will not result in a net loss of GRSG Key habitat or habitat fragmentation or other impacts causing a decline in the population of the species within the relevant Conservation Area (the project will be outside Key habitat in areas not meeting desired habitat conditions or the project will provide a benefit to habitat areas that are functioning in a limited way as habitat);* *d. The development cannot be reasonably accomplished outside of the PHMA; or can be either:* *1) developed pursuant to a valid existing authorization; or 2) is co-located within the*	*The development associated with road improvement is expected to result in a net gain of GRSG habitat because established fuel breaks are expected to protect new seedings (which included sagebrush) from future fires, protect unburned key habitat from fire, and are expected cause an overall increase (Net Gain) in sagebrush cover (Key Habitat) in PHMA and IHMA habitat over time. Although this project would result in X acres of habitat loss, it would provide increased protection from fires for approximately X acres. This would result in a net conservation gain as described in the effects analysis of the EA.* *The proposed project is collocated entirely within existing roadways (though about 1/3 are currently undeveloped). Many of these roads would be widened to facilitate access for emergency responders and to increase the width of the proposed fuel breaks. Roads that are not currently maintained regularly but are proposed to be upgraded and maintained as part of this project would add to the existing disturbance on the landscape. This project is expected to result in X acres of new disturbance from road upgrades, and at total of X acres of habitat loss associated with the road widening and the brush mowing. Most of the proposed fuel breaks are within the soda fire perimeter and most of the sagebrush was removed by the fire. Therefore, the creation of fuel breaks in those areas would not result in additional habitat loss or gain for actual direct habitat benefits –*

Management Decision Number	Apply?	Management Decision Text	Conformance Statement.
		footprint of existing infrastructure (proposed actions will not increase the 2011 authorized footprint and associated impacts more than 50 percent, depending on industry practice). *e. Development will be implemented adhering to the required design features (RDF) described in* ***Appendix C****;* *f. The project will not exceed the disturbance cap (MD SSS 27)* *g. The project has been reviewed by the State Implementation Team and recommended for consideration by the Idaho Governor.*	*for-instance - if the fuel break is seeded to forage kochia that is considered a type conversion that will not provide cover or forage benefits to GRSG.* *Development cannot be reasonably accomplished outside PHMA or IHMA since fuel breaks need to be strategically located within and adjacent to the habitat they are intended to protect.* *Project work will adhere to all applicable RDFs.* *This project will not cause the project area to exceed the 3% disturbance cap, nor will the BSU exceed the 3% disturbance cap.*
MDSS 30		*The following Anthropogenic Disturbance Development Criteria must be met in the screening and assessment process for proposals in PHMA and IHMA to discourage additional disturbance in PHMA and IHMA (as described in MD LR 2 and MD RE 1; applies to Idaho only):* *a. Through coordination with the USFWS and State of Idaho (as described in MD CC 1), it is determined that the project cannot be achieved, technically or economically, outside of this management area; and* *b. The project siting and/or design should best reduce cumulative impacts and/or impacts on GRSG and other high value natural, cultural, or societal resources; this may include colocation within the footprint for existing infrastructure, to the extent practicable; and* *c. The project results in a net conservation gain to GRSG Key habitat or with beneficial mitigation actions reduces habitat fragmentation or other threats within the Conservation Area; and* *d. The project design mitigates unavoidable impacts through appropriate compensatory mitigation; and* *e. Development will be implemented adhering to the RDFs described in* ***Appendix C****.* *f. The project will not exceed the disturbance cap (MD SSS 27).*	*This project has been coordinated with USFWS and the State of Idaho through the development of the Soda Fire ESR project and through scoping.* *It cannot be achieved outside of this management area because moving the project outside GRSG habitat would not meet the purpose and need of protecting GRSG habitat. The intent of this project is to strategically place fuel breaks within sagebrush steppe to help reduce the risk of large wildfires in sagebrush habitat.* *This project is expected to reduce the cumulative impacts of fire on GRSG habitat. As a result, net conservation gain is expected.* *Project work will adhere to all applicable RDFs.*

Management Decision Number	Apply?	Management Decision Text	Conformance Statement.
MDSS 32	**Yes**	*Incorporate RDFs as described in* ***Appendix C*** *in the development of project or proposal implementation, reauthorizations or new authorizations and suppression activities, as conditions of approval (COAs) into any post-lease activities and as best management practices for locatable minerals activities, to the extent allowable by law, unless at least one of the following conditions can be demonstrated and documented in the NEPA analysis associated with the specific project: a. A specific RDF is not applicable to the site-specific conditions of the project or activity; b. A proposed design feature or BMP is determined to provide equal or better protection for GRSG or its habitat; or c. Analysis concludes that following a specific RDF will provide no more protection to GRSG or its habitat than not following it, for the project being proposed.*	*See the RDF section below.*
MD SSS 33	**Yes**	*Conduct implementation and project activities, including construction and short-term anthropogenic disturbances consistent with seasonal habitat restrictions described in* ***Appendix C****.*	*Seasonal restrictions have been incorporated into the proposed action. See the rationale for each one in the RDF section below.*
MD SSS 38	**Yes**	*Monitor the effectiveness of projects (e.g., fuel breaks. fuels treatments) until objectives have been met or until it is determined that objectives cannot be met, according to the monitoring schedule identified for project implementation.*	*Monitoring has been incorporated into the proposed action. See Chapter 2 of the EA.*
MD SSS 39	**Yes**	*Monitor invasive vegetation post vegetation management treatment.*	*Monitoring has been incorporated into the proposed action.*
MD SSS 40	**Yes**	*Monitor project construction areas for noxious weed and invasive species for at least 3 years, unless control is achieved earlier.*	*Monitoring has been incorporated into the proposed action.*
MD VEG 1	**Yes**	*Implement habitat rehabilitation or restoration projects in areas that have potential to improve GRSG habitat using a full array of treatment activities as appropriate, including chemical, mechanical and seeding treatments.*	*This project relates to this MD in that its intent to is to protect GRSG habitat restoration projects. MD VEG 1-13 are mostly focused on the improvement of existing habitat or the restoration of habitat which is outside the scope of this project. However this project is intended to protect and facilitate ongoing restoration projects associated with the Soda Fire. Therefore while some of these MDs are being followed in some aspects,*

Management Decision Number	Apply?	Management Decision Text	Conformance Statement.
			they are not the focus of this fuel breaks project and do not apply.
MD FIRE 9	**Yes**	*Implement activities identified within the FIAT Assessments.*	*This project includes measures recommended by FIAT assessments in a FIAT area.*
MD FIRE 17	**Yes**	*Design and implement fuels treatments that will reduce the potential start and spread of unwanted wildfires and provide anchor points or control lines for the containment of wildfires during suppression activities with an emphasis on maintaining, protecting, and expanding sagebrush ecosystems and successfully rehabilitated areas and strategically and effectively reduce wildfire threats in the greatest area.*	*This is the purpose of the proposed project*
MD FIRE 19	**Yes**	*Apply appropriate seasonal restrictions for implementing vegetation and fuels management treatments according to the type of seasonal habitats present. Allow no treatments in known winter range unless the treatments are designed to strategically reduce wildfire risk around and/or in the winter range and will protect, maintain, increase, or enhance winter range habitat quality. Ensure chemical applications are utilized where they will assist in success of fuels treatments. Strategically place treatments on a landscape scale to prevent fire from spreading into PHMA or WUI.*	*The purpose of the proposed project is to enhance the overall quality of winter range habitat.*
MD FIRE 22	**Yes**	*Fuel treatments will be designed through an interdisciplinary process to expand, enhance, maintain, and protect GRSG habitat which considers a full range of cost effective fuel reduction techniques, including: chemical, biological (including grazing and targeted grazing), mechanical and prescribed fire treatments.*	*The proposed action provides for a wide variety of treatment options intended to improve habitat quality for sage-grouse and other wildlife by altering the fire regime for the purpose of protecting GRSG habitat.*
MD FIRE 25	**Yes**	*Strategically pre-treat areas to reduce fine fuels consistent with areas and results identified within the Wildfire and Invasive Species Assessments.*	*This project includes targeted grazing and pre-emergence herbicide application as recommended by FIAT assessments in a FIAT area.*
MD FIRE 29	**No**	*Prioritize the use of native seeds for fuels management treatment based on availability, adaptation (site potential), and probability of success. Where probability of success or native seed availability is low or non-economical, nonnative seeds may be used to meet GRSG habitat objectives to trend toward*	*This project is not a restoration project. Native species may be used in concert with non-native species at higher elevations but the purpose is to create and maintain a fuel break so*

Management Decision Number	Apply?	Management Decision Text	Conformance Statement.
		restoring the fire regime. When reseeding, use fire resistant native and nonnative species, as appropriate, to provide for fuel breaks.	*restoration is not the goal of the project.*
MD FIRE 31	**YES**	*If prescribed fire is used in GRSG habitat, the NEPA analysis for the Burn Plan will address:* *–why alternative techniques were not selected as a viable options;* *– how GRSG goals and objectives will be met by its use;* *– how the COT Report objectives will be addressed and met;* *– a risk assessment to address how potential threats to GRSG habitat will be minimized.* *Allow prescribed fire as a vegetation or fuels treatment in Wyoming big sagebrush sites or other xeric sagebrush species sites, or in areas with a potential for post-fire exotic annual dominance only after the NEPA analysis for the Burn Plan has addressed the four bullets outlined above. Prescribed fire can be used to meet specific fuels objectives that will protect Greater Sage-Grouse habitat in PHMA (e.g., creation of fuel breaks that will disrupt the fuel continuity across the landscape in stands where annual invasive grasses are a minor component in the understory, burning slash piles from conifer reduction treatments, used as a component with other treatment methods to combat annual grasses and restore native plant communities).* *Allow prescribed fire in known sage-grouse winter range only after the NEPA analysis for the Burn Plan has addressed the four bullets outlined above. Any prescribed fire in winter habitat will need to be designed to strategically reduce wildfire risk around and/or in the winter range and designed to protect winter range habitat quality.*	*The proposed action identifies that a burn plan will be developed for each project and would include the required points. (EA page 41)*
MD FIRE 34	**Yes**	*Provide adequate rest from livestock grazing to allow natural recovery of existing vegetation and successful establishment of seeded species within burned/ESR areas. All new seedings of grasses and forbs should not be grazed until at least the end of the second growing season, and longer as needed to allow plants to mature and develop robust root systems which will stabilize the site, compete effectively against cheatgrass and*	*This is incorporated into the proposed action for all new seedings.*

Management Decision Number	Apply?	Management Decision Text	Conformance Statement.
		other invasive annuals, and remain sustainable under long-term grazing management. Adjust other management activities, as appropriate, to meet ESR objectives.	
MD FIRE 36	**No**	*Following seedling establishment, modify grazing management practices if needed to achieve long-term vegetation and habitat objectives.*	*Grazing of seeded fuel breaks (once established) is desirable to improve their function.*
MD LG 11	**Yes**	*Design any new structural range improvements, following appropriate cooperation, consultation and coordination, to minimize and/or mitigate impacts on GRSG habitat. Any new structural range improvements should be placed along existing disturbance corridors or in unsuitable habitat, to the extent practical, and are subject to RDFs (**Appendix C**). Structural range improvement in this context, include, but are not limited to: fences, exclosures, corrals or other livestock handling structures; pipelines, troughs, storage tanks (including moveable tanks used in livestock water hauling), windmills, ponds/reservoirs, solar panels and spring developments.*	*This is incorporated into the proposed action.*
MD LG 13	**Yes**	*Prioritize removal, modification or marking of fences or other structures in areas of high collision risk following appropriate cooperation, consultation and coordination to reduce the incidence of GRSG mortality due to fence strikes (Stevens et al. 2012).*	*Marking of fences is part of the proposed action (EA pg. 94)*
MD CC 9	**Yes**	*All prescribed burning will be coordinated with state and local air quality agencies to ensure that local air quality is not significantly impacted by BLM activities.*	*Prescribed fire coordination is described in the proposed action (pg 41 of EA)*

Required Design Features that Seem Applicable:

RDF Number	Apply?	RDF Text	Conformance Statement.
1	**Yes**	*Solicit and consider expertise and ideas from local landowners, working groups, and other federal, state, county, and private organizations during development of projects.*	*This project was scoped to the appropriate landowners, working groups and other federal, state, county and private organizations prior to development.*

RDF Number	Apply?	RDF Text	Conformance Statement.
2	**Yes**	*No repeated or sustained behavioral disturbance (e.g., visual, noise over 10 dbA at lek, etc.) to lekking birds from 6:00 pm to 9:00 am within 2 miles (3.2 km) of leks during the lekking season.*	*Incorporated into all action alternatives.*
3	**Yes**	*Avoid mechanized anthropogenic disturbance, in nesting habitat during the nesting season when implementing: 1) fuels/vegetation/habitat restoration management projects, 2) infrastructure construction or maintenance, 3) geophysical exploration activities; 4) organized motorized recreational events.*	*Incorporated into all action alternatives.*
4	**Yes**	*Avoid mechanized anthropogenic disturbance during the winter, in wintering areas when implementing: 1) fuels/vegetation/habitat restoration management projects, 2) infrastructure construction or maintenance, 3) geophysical exploration activities; 4) organized motorized recreational events.*	*Incorporated into all action alternatives.*
14	**Yes**	*Power-wash all firefighting vehicles, to the extent possible, including engines, water tenders, personnel vehicles, and all-terrain vehicles (ATV) prior to deploying in or near sage-grouse habitat areas to minimize noxious weed spread.*	*Incorporated into all action alternatives.*
20	**Yes**	*Where applicable, design fuels treatment objectives to protect existing sagebrush ecosystems, modify fire behavior, restore native plants, and create landscape patterns which most benefit sage-grouse habitat.*	*Protecting existing and recovering sagebrush ecosystems is the objective of this project.*
22	**Yes**	*Use burning prescriptions which minimize undesirable effects on vegetation or soils (e.g., minimize mortality of desirable perennial plant species and reduce risk of annual grass invasion).*	*Incorporated into all action alternatives.*
23	**Yes**	*Ensure proposed sagebrush treatments are planned with full interdisciplinary input pursuant to NEPA and coordination with state fish and wildlife agencies, and that treatment acreage is conservative in the context of surrounding sage-grouse seasonal habitats and landscape.*	*Sagebrush treatments proposed in this EA have followed this RDF and will only be implemented alongside roads for the strategic purposes of fuel break development.*
24	**Yes**	*Where appropriate, ensure that treatments are configured in a manner that promotes use by sage-grouse.*	*Treatment areas are not expected to be used by sage-grouse but ae expected to enhance sage-grouse habitat over a much larger area.*
25	**Yes**	*Where applicable, incorporate roads and natural fuel breaks into fuel break design.*	*Roads and natural fuel breaks have been incorporated into project design.*

RDF Number	Apply?	RDF Text	Conformance Statement.
26	**Yes**	*Power-wash all vehicles and equipment involved in fuels management activities, prior to entering the area, to minimize the introduction of undesirable and/or invasive plant species.*	*Incorporated into all action alternatives.*
27	**Yes**	*Design vegetation treatments in areas of high fire frequency which facilitate firefighter safety, reduce the potential acres burned, and reduce the fire risk to sage-grouse habitat. Additionally, develop maps for sage-grouse habitat which spatially display existing fuels treatments that can be used to assist suppression activities.*	*The design of this project follows this RDF.*
28	**Yes**	*As funding and logistics permit, restore annual grasslands to a species composition characterized by perennial grasses, forbs, and shrubs or one of that referenced in land use planning documentation.*	*This project is expected to indirectly implement this RDF. The fuel breaks are intended to reduce fire frequency and intensity which is expected to increase the success of restoration projects but this project in itself is not a restoration project.*
29	**NO**	*Emphasize the use of native plant species, especially those from a warmer area of the species' current range, recognizing that non-native species may be necessary depending on the availability of native seed and prevailing site conditions.*	*Native plant species would be used especially at higher elevations but will not be emphasized because they are less effective in fuel breaks.*
31	**Yes**	*Protect wildland areas from wildfire originating on private lands, infrastructure corridors, and recreational areas.*	*Fuel Breaks constructed by this project would help achieve the objective of this RDF.*
32	**Yes**	*Reduce the risk of vehicle- or human-caused wildfires and the spread of invasive species by installing fuel breaks and/or planting perennial vegetation (e.g., green-strips) paralleling road rights-of-way.*	*This is the main action of the proposed project.*
33	**Yes**	*Strategically place and maintain pre-treated strips/areas (e.g., mowing, herbicide application, etc.) to aid in controlling wildfire, should wildfire occur near PHMA or priority restoration areas (such as where investments in restoration have already been made).*	*This is included in all action alternatives.*
34	**Yes**	*Design treatments to provide a break in fuel continuity in large, at-risk, expanses of continuous sagebrush. Use local knowledge of fire occurrence, spread patterns, and habitat values at risk to determine the proper placement and size of the fuel break.*	*This is included in all action alternatives.*
37	**Yes**	*Use existing NEPA documentation and authorities, where possible, when conducting road right-of-way maintenance. In many instances, existing authorizations for roads or linear rights-of-way contain provisions for*	*One alternative would consider only using existing NEPA authorizations. However portions of the proposed action could not occur without the*

RDF Number	Apply?	RDF Text	Conformance Statement.
		maintenance activities that could be implemented and incorporated into a vegetation and habitat protection strategy without requiring additional NEPA analysis. Document this with a Determination of NEPA Adequacy (DNA).	*additional analysis found in this new EA.*
39	**Yes**	*Spatially depict the locations of existing and planned fuel breaks in a landscape fuel break map and label each vegetation polygon for reference. Offices will make these maps available to suppression resources for use in fire operations.*	*Maps of fuel breaks will be included in the EA and will be provided to suppression resources if approved.*
40	**Yes**	*Utilize available plant species based on their adaptation to the site when developing seed mixes. (Lambert 2005; VegSpec).*	*This is included in all action alternatives.* *RDFs 40-51 are mostly focused on the improvement of existing habitat or the restoration of habitat which is outside the scope of this project. However this project is intended to protect and facilitate ongoing restoration projects associated with the Soda Fire. Therefore while some of these RDFs are being followed, they are not the focus of this fuel breaks project.*
88	**Yes**	*Utilize existing roads, or realignments of existing routes to the extent possible.*	*All roads included in this project are already existing roads.*
89	**Yes**	*Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.*	*Roads would only be constructed to meet administrative road purposes to allow firefighter access to the fuel breaks. These routes would be improved and maintained to a level that ensures safe access and reduces travel times to fires.*
96	**No**	*Locate roads to avoid priority areas and habitats as described in the Wildfire and Invasive Species Assessments.*	*New routes would not be established through this project.*
105	**Yes**	*Avoid building new wire fences within 2 km of occupied leks (Stevens 2011). If this is not feasible, ensure that high risk segments are marked with collision diverter devices or as latest science indicates.*	*This is included in all action alternatives.*
107	**Yes**	*Utilize temporary fencing (e.g., ESR, drop down fencing) where feasible and appropriate to meet management objectives.*	*This is included in all action alternatives.*

Is Mitigation Required: **No**	
Rationale or Brief Description of Mitigation: Mitigation would not be required for this project because the expected effect of establishing fuel breaks on GRSG is that more GRSG habitat (including PHMA and IHMA managed as PHMA due to a tripped habitat trigger) would eventually meet sagebrush cover needs for GRSG and that there would already be a net benefit to GRSG as a result. Although this project will remove sage-grouse habitat, it is expected to protect significantly more habitat from wildfire than would be removed by the project.	
Based on the Above Review, Is the Project in Conformance with the Sage-grouse ARMPA (Sept 2015)?: **Yes**	
Rationale: This fuel breaks project is in conformance with the sage-grouse ARMPA because it incorporates all the applicable Management Decisions and RDFs and does not violate any of the decisions within the ARMPA. The Majority of this project is occurring within the soda fire perimeter where the majority of sagebrush was removed, therefore the amount of actual habitat removed is much less than if the project were occurring within intact habitat. These fuels breaks are intended to protect restoration activities and once fully restored are expected to reduce the risk of large wildfires and future loss of habitat in this same area.	
--State Office Use Only---------------------------------	
Reviewers: Ammon Wilhelm, Anne Halford	**Date: 4/26/2016**
Is this a Preliminary or Final Review: **Preliminary Review**	
Additional Needs:	
Conclusion: Based on the above review, this project is in conformance with the ARMPA.	

6.2 Appendix B: Soda Fire Behavior, Weather, and Fuel Conditions

The Soda Fire ignited on August 10th, 2015 approximately 8 miles northeast of Jordan Valley, OR on the Boise District BLM in Idaho. The fire was detected by the South Mountain BLM Lookout at 13:10 MDT and reported to Boise Dispatch. The initial attack Incident Commander size-up was 250 acres, running in grass and brush with south winds at 10-20 mph and the potential to reach 5,000 acres by the end of the day. Initial attack resources stated the fire was 100% active when they arrived (USDI BLM 2015). Wind gusts at the two closest remote automated weather stations (RAWS), Triangle and Owyhee Ridge, were recorded at 28 mph and 35 mph respectively.

The weather conditions preceding the fire were hotter and drier than normal with maximum temperatures around 10-20 degrees above normal. Persistent extreme drought conditions across Owyhee County resulted in very dry fuels. Primary fuels on the fire were grass and sagebrush. The continuous fuel bed was the primary factor in the rapid spread and large acreage burned. In much of the area the sagebrush appeared decadent and had a significant dead component that contributed to fire spread and very high flame lengths (Whalen et al. 2015).

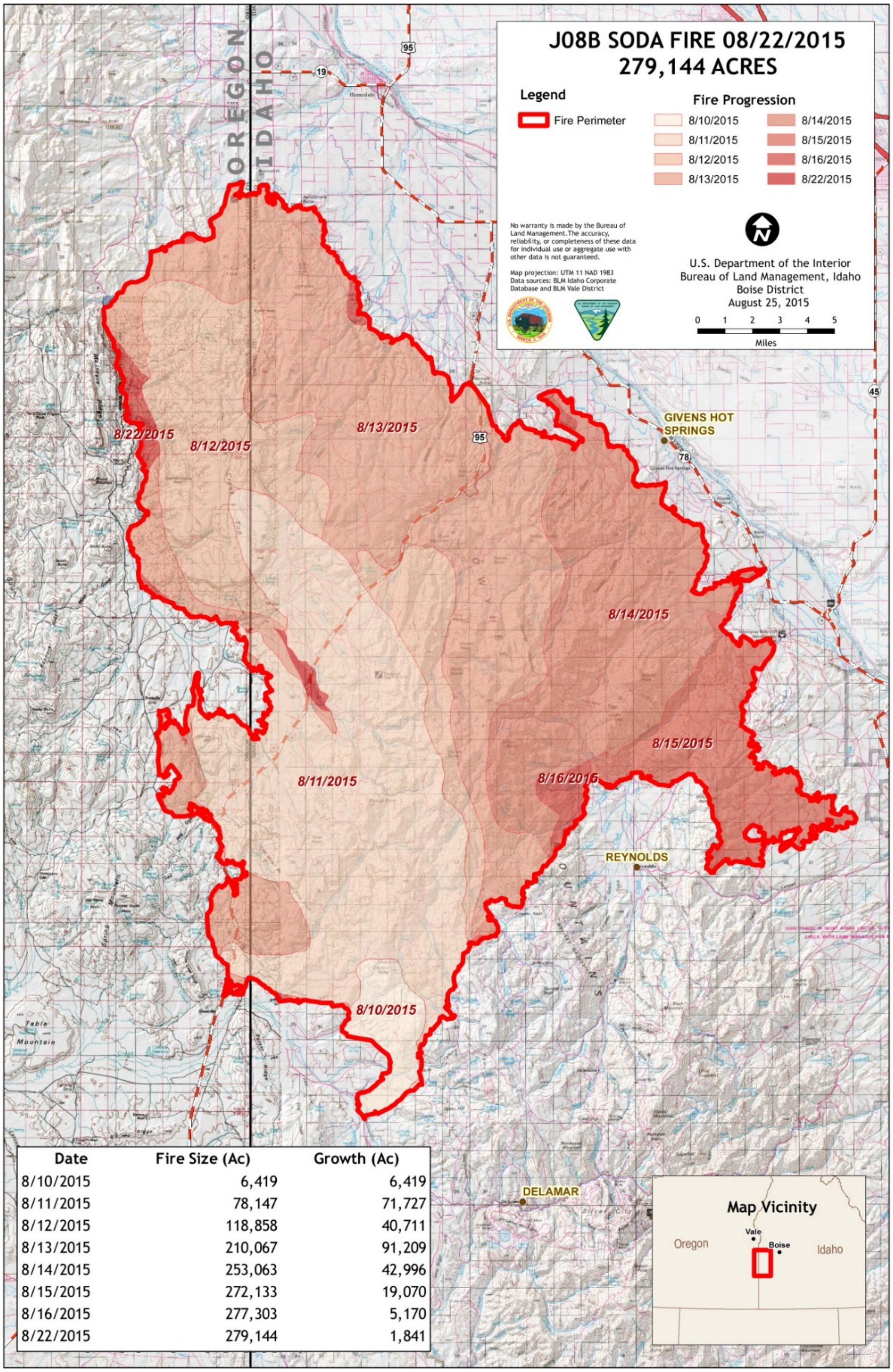
Low humidity and high winds were significant factors in fire spread throughout the fire duration. The continuous flashy fuels on the fire resulted in rapid rates of spread with moderate winds and extreme rates of spread (up to 450 ch/hr) under high wind conditions. Flame lengths in grass reached upwards of 8-10 feet and 20-30 feet in sagebrush (Whalen et al. 2015).

The table below provides a summary of the fire's progression and associated weather conditions from 8/10/15-8/15/15 during the time periods of extreme fire behavior and fire growth. Map 1 illustrates the Soda Fire's progression from August 10th to August 22nd, 2015.

Table 1.

Date	Fire Size (Ac)	Growth (Ac)	Max. Temp (°F)[1]	Max. Winds (mph)[1]	Min. RH (%)[1]
8/10/2015	6,419	6,419	85	35	19
8/11/2015	78,147	71,727	94	30	10
8/12/2015	118,858	40,711	94	30	8
8/13/2015	210,067	91,209	97	28	5
8/14/2015	253,063	42,996	93	43	8
8/15/2015	272,133	19,070	81	19	17

[1] Weather conditions from the Owyhee Ridge RAWS display the maximum temperature, maximum wind, and minimum relative humidity recorded between 12 pm and 5 pm for each day.



Date	Fire Size (Ac)	Growth (Ac)
8/10/2015	6,419	6,419
8/11/2015	78,147	71,727
8/12/2015	118,858	40,711
8/13/2015	210,067	91,209
8/14/2015	253,063	42,996
8/15/2015	272,133	19,070
8/16/2015	277,303	5,170
8/22/2015	279,144	1,841

Map 1.

The following guidelines and fuel moisture break-points in Table 2 were developed by Nevada BLM from years of past fire and fuels observations (USDI BLM 2007).

Table 2. Guidelines and Fuel Moisture Break-Points

181% and Higher	Fires will exhibit **VERY LOW FIRE BEHAVIOR** with difficulty burning. Residual fine fuels from the previous year may carry the fire. Foliage will remain on the stems following the burn. Fires can generally be attacked at the head or flanks by persons using hand tools. Handline should hold fire without any problems. Fires will normally go out as soon as the wind dies down.
151% to 180%	Fires will exhibit **LOW FIRE BEHAVIOR** with fire beginning to be carried in the live fuels. Both foliage and stem material up to ¼-inch in diameter will be consumed by the fire. Burns will be generally patchy with many unburned islands. Engines may be necessary to catch fires at the head and handline will be more difficult to construct, but should hold at the head and the flanks.
126% to 150%	Fires will exhibit **MODERATE FIRE BEHAVIOR** with a fast continuous rate of spread that will consume stem material up to 2-inches in diameter. These fires may be attacked at the head with engines but may require support of dozers and retardant aircraft. Handline will become ineffective at the fire head, but should still hold at the flanks. Under high winds and low humidity, indirect line should be considered.
101% to 125%	Fires will exhibit **HIGH FIRE BEHAVIOR** leaving no material unburned. Frontal attack with fire engines and dozers will be nearly impossible on large fires, but may still be possible on smaller, developing fires. Aircraft will be necessary on all these fires. Flanking attack by engines and indirect attack ahead of the fire must be used. Spotting should be anticipated. Fires will begin to burn through the night, calming down several hours before sunrise.
75% to 100%	Fires will exhibit **EXTREME FIRE BEHAVIOR**. Extreme rates of spread and moderate to long range spotting will occur. Engines and dozers may be best used to back up firing operations, and to protect structures. Indirect attack must be used to control these fires. Fires will burn actively through the night. Air turbulence caused by the fire will cause problems for air operations.
74% and Below	Fires will exhibit **ADVANCED FIRE BEHAVIOR** with high potential to control their environment. Large acreage will be consumed in a very short time period. Backfiring from indirect line, roads, etc. must be considered. Aircraft will need to be cautious of hazardous turbulence around the fire.

Live fuel moisture readings captured on August 3rd indicated the potential for **EXTREME FIRE BEHAVIOR** and are illustrated in Table 3. The nearest sites to the Soda Fire were the Wild West site located along I-84 at mile marker 13, and the Triangle site just east of the fire.

Table 3. Live fuel moisture readings captured on August 3rd, 2015

Site	Elevation	Fuel Type	Average Past % Moisture	%Moisture Computrac (8/3/2015)	Previous % Computrac (7/16/2015)	Change % Computrac	Fire Behavior	Years of Data
Kuna	3,060 ft	Wyoming Sagebrush	83	84	95	-11	Extreme	14
Wild West	2,593 ft	Wyoming Sagebrush	80	80	97	-17	Extreme	14
Hammett	2,706 ft	Wyoming Sagebrush	89	89	96	-7	Extreme	14
Triangle	5,186 ft	Mountain Sagebrush	114	99	119	-20	Extreme	7
Blackstone	5,000 ft	Wyoming Sagebrush	55	79	76	3	Extreme	4
Triangle	5,186 ft	Western Juniper	83	90	98	-8	Moderate	4
Wild West	2,593 ft	Forage kochia	NA	93	128	-35	Moderate	2
Simco	3,000 ft	Forage kochia	NA	74	86	-12	Moderate	2

Fuel Model Comparisons

The BehavePlus system (version 5.05) was used to model fire behavior for Soda Fire conditions and desired fuel conditions within a fuel break segment. All information regarding fuel models cited here and in the following analyses is from Scott and Burgan (2005). Vegetative fuels present during the Soda Fire are best classified using a moderate load, dry climate grass-shrub fuel type (GS2), with shrubs averaging 1 to 3 feet in height. The primary carriers of fire in the GS2 fuel model are grass and shrubs combined. Shrubs are 1 to 3 feet high, grass load is moderate. Spread rate is high and flame length is moderate (See Image 2).

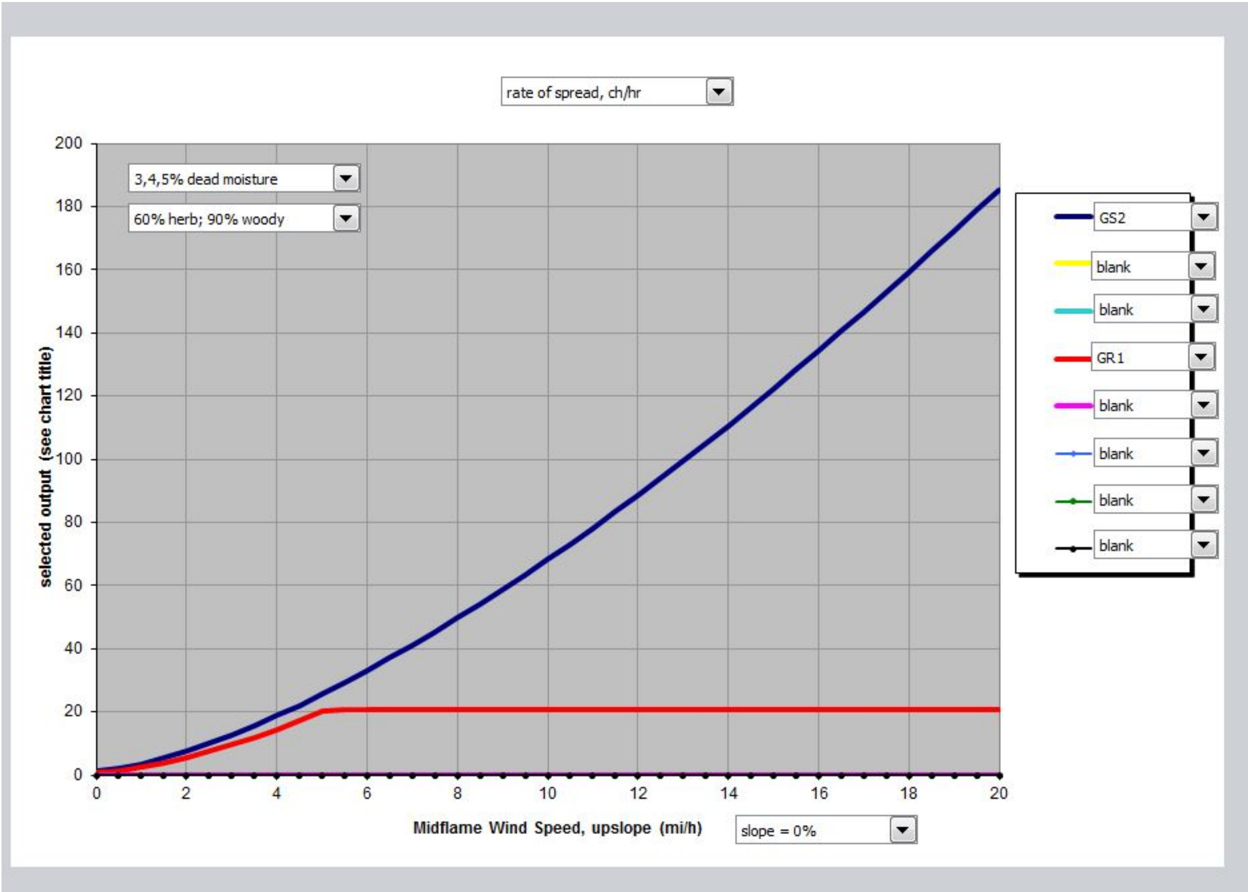
The desired fuel type for fuel break segments is best classified using the GR1 fuel model: Short, Sparse Dry Climate Grass (Dynamic). The primary carrier of fire in GR1 is sparse grass, though small amounts of fine dead fuel may be present. The grass in GR1 is generally short, either naturally or by grazing, and may be sparse or discontinuous. Spread rate and flame length are low (See Image 1).

When these fuel types (GS2 and GR1) are modeled side by side, the results show the surface rate of spread, fire line intensity, and flame length are less for GS2 than GR1, with differences becoming less with increasing wind speed. For the purpose of modeling predicted fire behavior between these fuel types (GS2 and GR1), weather observations recorded on the Triangle and Owyhee RAWS (Table 3) were used along with live fuel moisture readings captured on August 3rd, 2015.

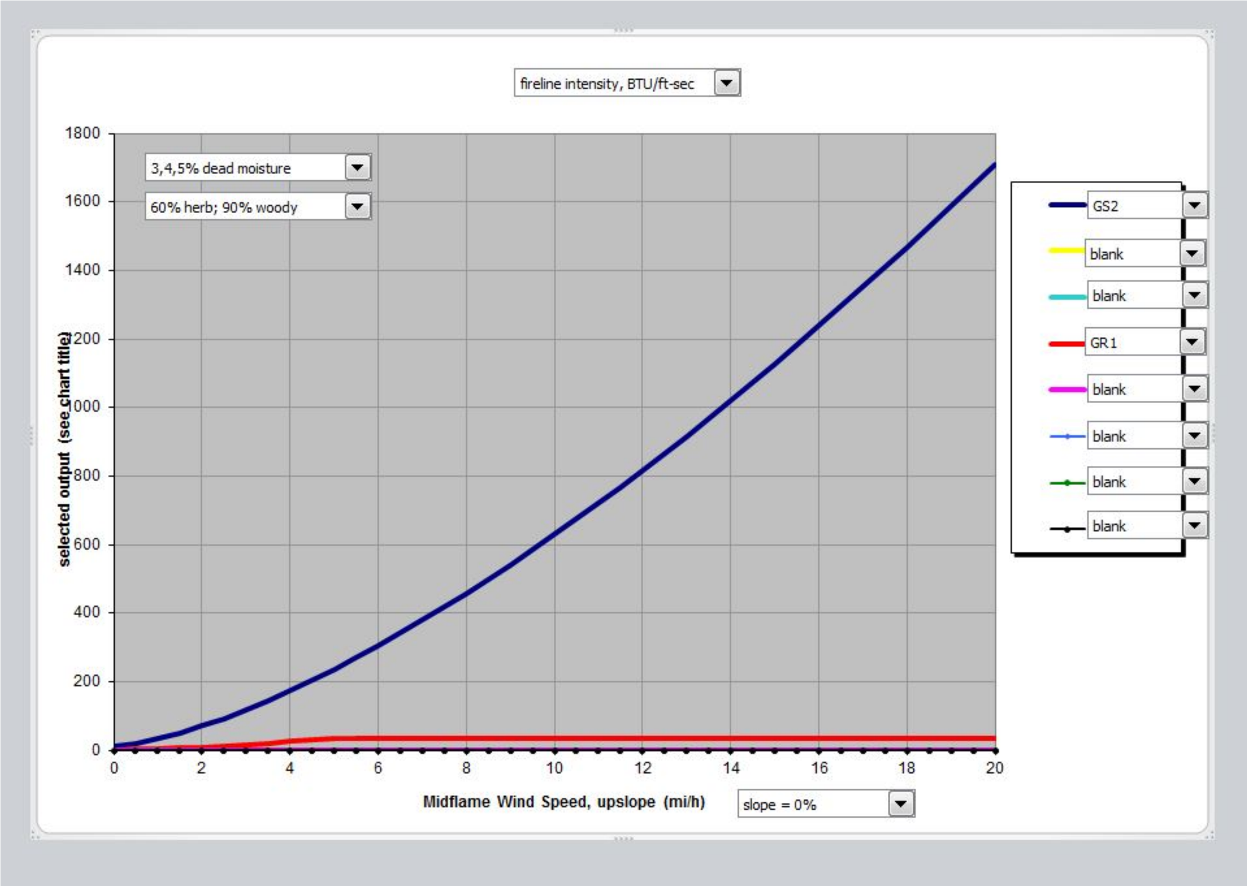
Table 4. Results of a BehavePlus model comparing predicted fire behavior in grass-shrub (GS2) and grass (GR1) fuel types under varied wind speeds. This model compares the predominate fuels present during the Soda Fire (GS2) with the desired fuel conditions within a fuel break segment (GR1).

Fire Behavior Characteristics	Fuel Model GR1 (Desired Fuel Break Conditions)					Fuel Model GS2 (Soda Fire Fuel Conditions)				
	Wind Speed (MPH)					Wind Speed (MPH)				
	5	10	20	30	40	5	10	20	30	40
Surface Rate of Spread (chains/hour)	20	21	21	21	21	26	68	185	250	250
Fire Line Intensity (Btu/ft/s)	34	35	35	35	35	238	633	1721	2320	2320
Flame Length (ft)	2.3	2.3	2.3	2.3	2.3	5.6	8.7	13.9	15.9	15.9

Graph 1. Surface rate of spread (ch/hr) Graph Comparison between GS2 (blue) and GR1 (red)



Graph 2. Fire Line Intensity (Btu/ft/s) Comparison between GS2 (blue) and GR1 (red)



Graph 3. Fire Line Intensity (Btu/ft/s) Comparison between GS2 (blue) and GR1 (red)

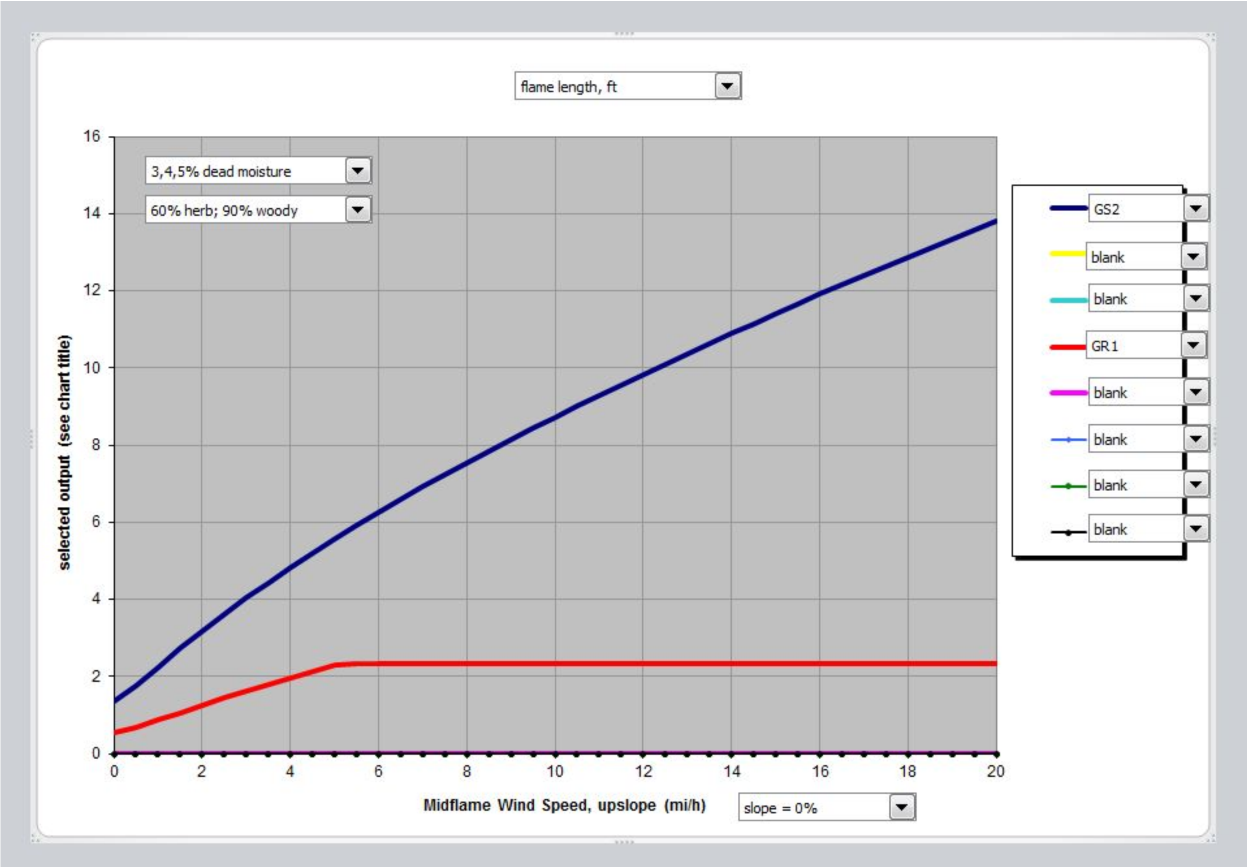


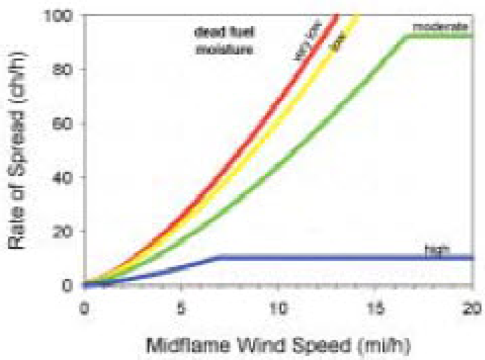
Image 1. GS2 Fuel Model

GS2 (122)

Moderate Load, Dry Climate Grass-Shrub (Dynamic)

Description: The primary carrier of fire in GS2 is grass and shrubs combined. Shrubs are 1 to 3 feet high, grass load is moderate. Spread rate is high; flame length moderate. Moisture of extinction is low.

Fine fuel load (t/ac)	2.1
Characteristic SAV (ft-1)	1827
Packing ratio (dimensionless)	0.00249
Extinction moisture content (percent)	15



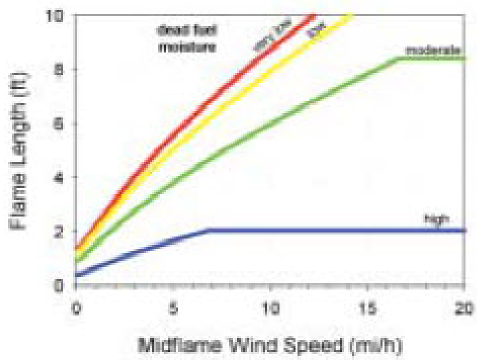


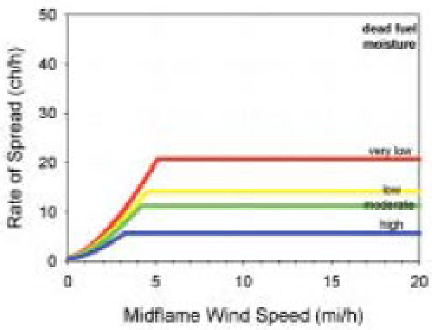
Image 2. GR1 Fuel Model

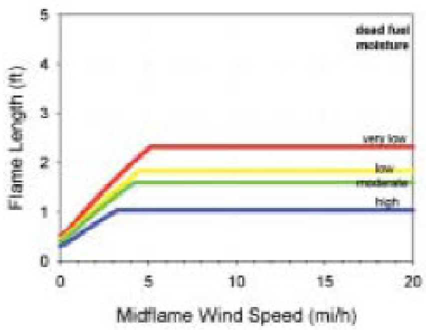
GR1 (101)

Short, Sparse Dry Climate Grass (Dynamic)

Description: The primary carrier of fire in GR1 is sparse grass, though small amounts of fine dead fuel may be present. The grass in GR1 is generally short, either naturally or by grazing, and may be sparse or discontinuous. The moisture of extinction of GR1 is indicative of a dry climate fuelbed, but GR1 may also be applied in high-extinction moisture fuelbeds because in both cases predicted spread rate and flame length are low compared to other GR models.

Fine fuel load (t/ac)	0.40
Characteristic SAV (ft-1)	2054
Packing ratio (dimensionless)	0.00143
Extinction moisture content (percent)	15





References

Scott, J.H., and R.E. Burgan. 2005. Standard fire behavior fuel models: a comprehensive set for use with Rothermel's surface fire spread model. General Technical Report RMRS-GTR-153. Rocky Mountain Research Station, Fort Collins, CO. 72 pp.

USDI BLM. 2007. *Fuel Moisture Sampling Guide*. April 20017

USDI BLM. 2015. *Large Fire Response Assessment*. August 18, 2015.

Whalen et al. 2015. Soda Fire Final Report Homedale, Idaho. August 15-18, 2015.