United States Department of the Interior
Bureau of Land Management

DRAFT ENVIRONMENTAL ASSESSMENT DOI-BLM-ID-B010-2011-0060-EA

Paradigm Fuel Break Project

UNITED STATES DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Boise District - Four Rivers Field Office
3948 Development Avenue
Boise, ID 83705

Environmental Assessment # DOI-BLM-ID-B010-2011-0060-EA
Paradigm Fuel Break Project

Table of Contents

1.0 Introduction 5
1.1 Background and History 5
1.1.1 Fire Behavior and Fuel Breaks 6
1.2 Need for and Purpose of Action 7
1.3 Conformance with Applicable Land Use Plans 8
1.4 Relationship to Statutes, Regulations, and Other Requirements 8
1.5 Scoping and Development of Issues 9
2.0 Description of the Alternatives 10
2.1 Alternative Development Process 10
2.2 Alternatives Considered But Not Analyzed in Detail 10
2.3 Description of Proposed Action and Alternatives 11
2.3.1 Alternative 1 - No Action 11
2.3.2 Alternative 2 – Proposed Action (All Routes) 12
2.3.2.1 Treatment methods common to all action alternatives 13
2.3.2.2 Design Features of the Proposed Action 17
2.3.3 Alternative 3 – All Routes Excluding Mayfield Road 23
2.3.4 Alternative 4 – Reduced Routes 23
2.3.5 Alternative 5 – Reduced Routes Excluding Mayfield Road 23
2.3.6 Alternative 6 – High Human Ignition Areas 23
2.4 Comparison of Alternatives 23
3.0 Affected Environment and Environmental Consequences 24
3.1 General Vegetation including Noxious and Invasive Weeds 26
3.1.1 Affected Environment 26
3.1.1.1 General Vegetation 26
3.1.1.2 Noxious weeds 27
3.1.2 Environmental Consequences 27
3.1.2.1 General Effects 27
3.1.2.2 Alternative 1 (No Action) 28
3.1.2.3 Alternative 2 -Proposed Action (All Routes) 28
3.1.2.4 Alternative 3 31
3.1.2.5 Alternative 4 32
3.1.2.6 Alternative 5 32
3.1.2.7 Alternative 6 32
3.1.3 Cumulative Effects 32
3.1.3.1 Alternative 1 – No Action 32
3.1.3.2 Alternative 2 – Proposed Action 32
3.1.3.3 Alternatives 3-6 – Action Alternatives 33
3.2 Special Status Plants 33
3.2.1 Affected Environment 34
3.2.2 Environmental Consequences 40
3.2.2.1 Alternative 1 – No Action 44

3.2.2.2 Alternative 2 –Proposed Action 44
3.2.2.3 Alternative 3 45
3.2.2.4 Alternative 4 46
3.2.2.5 Alternative 5 46
3.2.2.6 Alternative 6 46
3.2.3 Cumulative Effects 46
3.2.3.1 Scope of Analysis 46
3.2.3.2 Current Condition 46
3.2.3.3 Cumulative Impacts Analysis 47
3.2.3.4 Cumulative Impacts - Alternative 1 (No Action) 49
3.2.3.5 Alternative 2 (Proposed Action) 50
3.2.3.6 Alternative 3 50
3.2.3.7 Alternative 4 51
3.2.3.8 Alternative 5 51
3.2.3.9 Alternative 6 51
3.3 Wildlife including Fish and Special Status Animal Species 51
3.3.1 Affected Environment 51
3.3.2 Environmental Consequences 57
3.3.2.1 Alternative 1 – No Action 58
3.3.2.2 General Effects 61
3.3.2.3 Alternative 2 71
3.3.2.4 Alternative 3 72
3.3.2.5 Alternative 4 72
3.3.2.6 Alternative 5 72
3.3.2.7 Alternative 6 72
3.3.3 Cumulative Effects 73
3.3.3.1 Alternative 1 – No Action 73
3.3.3.2 Alternative 2-6 76
3.4 Cultural Resources 77
3.4.1 Affected Environment 77
3.4.2 Environmental Consequences 79
3.4.2.1 Alternative 1 – No Action 82
3.4.2.2 Alternative 2 – All Routes (Proposed Action) 82
3.4.2.3 Alternative 3 – All Routes Except Mayfield RD 82
3.4.2.4 Alternative 4 – Reduced Routes 83
3.4.2.5 Alternative 5 – Reduced Routes Except Mayfield RD 83
3.4.2.6 Alternative 6 – High Human Ignition Areas 84
3.4.3 Cumulative Effects 84
3.4.3.1 Alternative 2 85
3.4.3.2 Alternative 3 85
3.4.3.3 Alternative 4 85
3.4.3.4 Alternative 5 85
3.4.3.5 Alternative 6 85
3.5 Visual Resource Management 86
3.5.1 Affected Environment 86
3.5.2 Environmental Consequences 88

3.5.2.1 Alternative 1 ... 88
3.5.2.2 Alternative 2 ... 88
3.5.2.3 Alternative 3 ... 91
3.5.2.4 Alternative 4 ... 91
3.5.2.5 Alternative 5 ... 91
3.5.2.6 Alternative 6 ... 91
3.5.3 Cumulative Effects – Visual Resources ... 91
3.5.3.1 Scope of the Analysis ... 91
3.5.3.2 Current Conditions and Present Effects of Cumulative Actions ... 91
3.5.3.3 Alternative 1 ... 92
3.5.3.4 Alternatives 2-6 ... 92
3.6 Soils ... 92
3.6.1 Affected Environment ... 92
3.6.2 Environmental Consequences ... 93
3.6.2.1 Alternative 1- No Action ... 93
3.6.2.2 Alternative 2 ... 94
3.6.2.3 Alternative 3 ... 96
3.6.2.4 Alternative 4 ... 96
3.6.2.5 Alternative 5 ... 97
3.6.2.6 Alternative 6 ... 97
3.6.3 Cumulative Effects ... 97
3.6.3.1 Scope of Analysis ... 97
3.6.3.2 Current Conditions and Effects of Cumulative Actions ... 98
3.6.3.3 Alternative 1 (No Action) ... 99
3.6.3.4 Alternative 2 – 6 (Action Alternatives) ... 99
3.7 Air Quality ... 100
3.7.1 Affected Environment ... 100
3.7.2 Environmental Consequences ... 100
3.7.2.1 Alternative 1 ... 100
3.7.2.2 Alternative 2-6 ... 100
3.7.3 Cumulative Effects ... 101
4.0 Consultation and Coordination ... 101
4.1 List of Preparers ... 101
4.2 Agencies, Organizations, Tribes, and Individuals Consulted ... 101
5.0 Literature Cited ... 103
6.0 Appendices ... 115
6.1.1 Herbicide Treatment Standard Operating Procedures ... 115
6.1.2 NRCS Sage-grouse Initiative ... 130
7.0 Maps ... 139

1.0 Introduction

1.1 Background and History

A symposium sponsored by the Boise District Resource Advisory Council (RAC) was held in February 2011 in Boise, Idaho, to address "how collaborative resource management can break the current fire cycle". The symposium was attended by multiple state and federal government agencies, environmental organizations, academia, private landowners, federal grazing permit holders, and government policy makers. The primary goal of the symposium was to identify fire, fuel, and vegetation management methods appropriate for conserving high value and restoring Wyoming sagebrush steppe habitats by reducing fire frequency. The concept for this proposed action was initiated as a result of discussions among a steering committee that was formed following the symposium.

The Paradigm Project encompasses 293,891 acres of Federal, state, and private lands (Map 1). The western boundary of the project is Black Creeks Road north of Interstate 84 (I-84), located approximately 12 miles east of Boise. From Blacks Creek Road the project area includes all the area north of I-84 to the Mayfield Road to Mountain Home. From Mountain Home the northern boundary is along the Hot Springs, Rye Grass, Alkali, and King Hill Roads to the eastern boundary of the Four Rivers Field Office (FRFO). The project is within the FRFO (251,145 acres) and includes 42,749 acres within the Morley Nelson Snake River Birds of Prey National Conservation Area (NCA). BLM fire records show that approximately 75% of the 293,891 acres have burned at least once in the last 55 years (1957-2012). Since 1980, an estimated 618 ignitions, within the project area, developed into wildfires. Of those fire starts, 131 were lightning and 487 were human caused. Human caused ignitions are concentrated along transportation corridors, especially I-84 (Map 2).

There are several ranches, homes, and small communities that are at risk from wildfire, including houses, outbuildings, and businesses on the periphery of Mountain Home. Fire suppression efforts focus around these areas. For instance, during the 2012 Benwalk fire, suppression crews ignited backfires in the vegetation adjacent to restaurant and hotel parking lots at the Mountain Home I-84 exit to protect the structures from the advancing flames.

Native rangeland in the project area is predominately Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) with perennial grasses and forbs. However, since the late 1890s the Intermountain West has experienced an invasion of non-native annual grasses, such as cheatgrass (*Bromus tectorum*) and medusahead (*Taeniatherum caput-medusae*). These annual grasses are now widespread and in some areas have become the dominant plant species. Where these annual grasses dominate large-scale areas, ecosystem functions have been altered to the point of transitioning to a new steady state. Changes to an ecosystem from these non-native invasive annual plants can occur in just a few short years. Conversion from the current state back to a native perennial shrub-steppe plant community is not expected to occur without human intervention; requiring money, time, and conducive weather patterns. Invasive annual grasses fill available open spaces and provide an abundance of continuous fine fuel. Once established, cheatgrass and medusahead compete native vegetation, invade and degrade sensitive plant and animal habitats, and increase wildfire frequencies.

When large hot fires burn Wyoming big sagebrush, re-establishment can take between 20 to 50 years. Whisenant (1990) estimated fire return intervals for the Wyoming big sagebrush to be from 60-110 years. Vegetation response to fire occurring in areas with these invasive annual grasses is an exponential increase in their density, creating a continuous fine fuel load. Balch et al. (2013) found that fires were more likely to start in cheatgrass than in other vegetation types and that cheatgrass is associated with increased fire frequency, size, and duration.

Fire return intervals shorter than 10-15 years in a given area prevents the recovery of perennial species, thereby perpetuating the early seral plant community. Although the project area is identified as Wyoming big sagebrush with perennial grasses and forbs, the spread of invasive annual plants and short fire return intervals have resulted in the loss of thousands of acres of sagebrush and quality sage steppe habitat, including habitat for special status species.

Slickspot peppergrass (*Lepidium papilliferum* or LEPA) occurs within the project area. On August 8, 2012, the United States District Court for the District of Idaho ordered the final rule listing slickspot peppergrass as a threatened species under the Endangered Species Act (ESA) of 1973 as amended, be vacated and remanded for further consideration consistent with the court's decision. Currently, the USFWS considers slickspot peppergrass to be proposed endangered under ESA. Therefore, the BLM is conferencing with the USFWS under Section 7 of the ESA to ensure conservation of the species and adherence to the slickspot peppergrass Conservation Agreement (CA) between the two agencies (USFWS 2013).

The area provides habitat for Greater Sage-grouse, which is a candidate species for listing under the ESA. There are approximately 2,111 acres of preliminary priority habitat (PPH) and approximately 24,667 acres of preliminary general habitat (PGH) in the project area. The amount of sagebrush habitat within the project has been reduced by wildfires and the sagebrush that is present is often patchy and degraded by the presence of invasive annual grasses. Habitat quality in the project area has been further degraded by the presence of numerous roads, primitive routes, housing developments, power lines and wind turbines.

The project area contains the Oregon National Historic Trail which passes through the entire project area in a southeast to northwestern direction. The trail was a significant emigrant route between 1841 and 1848. On November 10, 1978, Public Law 95-625 amended the National Trails System Act (Public Law 90-543) and designated the Oregon Trail as a National Historic Trail. As a congressionally designated trail, the BLM must manage the scenic/historic integrity of the selected historic sites and cross country segments, avoid destruction of Trail resources, and consider Trail management responsibilities in land use plans (DOI Memorandum dated Sept. 28, 1984).

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. Pro-active options such as fuel breaks, help to alleviate the amount of suppression resources necessary to contain the fire, and allow for more forces to be allocated to protect life, property, and important habitat.

Documentation of the effectiveness of fuel breaks has not be conducted on a regular basis, however across the Boise District fires have burned into and sometimes through established fuel breaks (Ditto Rest and South Sim fires). The Idaho Falls District BLM office, reported on the effectiveness of an established fuel break near Craters of the Moon National Monument and Preserve (CMNMP). In the spring of 2012, the BLM implemented the first phase of the Big Desert Fuel Breaks Project. Fuel break construction began on April 30, 2012 and consisted of roto-mowing existing vegetation to a height of roughly eight inches in a 100-150 feet wide swath from the centerline, creating fuel breaks 200-300 feet in width. The Cox's Well Fire ignited on the afternoon of July 10, 2012 within the National Park Services (NPS) portion of the CMNMP. Strong, gusty winds and hot dry conditions allowed the fire to spread quickly north, east, and south and into the Upper Snake Field Office area. Suppression operations of the wildfire began around 13:30 with initial attack crews attempting to anchor and tie the fire into the Great Rift within the BLM managed CMNMP lands. When direct attack efforts failed, crews backed off to the Arco/Minidoka Road and started improving the road grade and back burning from the road. In the spring of 2012, portions of the Arco/Minidoka Road had been treated to establish a fuel break. These treated portions ultimately aided in suppression operations. During back burning off the Arco/Minidoka Road, flame lengths in the treated fuels compared to the untreated fuels were substantially lessened, averaging a height of approximately 2-feet. The mowed areas provided an area for suppression crews to safely and effectively implement the back burn operation and were instrumental in controlling this wildfire (Dyer 2012).

In other fire suppression activities and research, fuel breaks have either slowed enough for suppression crews to control the incident or have removed fuel sufficient to contain any further spread (Monsen and Memmott 1999).

1.2 Need for and Purpose of Action

Roughly 80% of the fire starts occurring along I-84 between Boise and Mountain Home are human caused (Map 2). During 2012, seven fires in and adjacent to, the project area burned approximately 60,065 acres. Cheatgrass or medusahead are a dominant component across much of the project area. Wildfires in shrub steppe vegetation areas dominated by annual grasses are difficult to control due to the speed at which fire can spread. Much of the project area is covered with cheatgrass and medusahead. Fast moving wildfires always put the public and firefighters at risk, andbut fires near structures and along high traffic roadways dramatically increase the risks. The 2012 fires led to vehicle accidents caused by panicked drivers and thick smoke on the interstate and other roadways. The fires also threatened homes and businesses, and burned important habitat for special status species.

Fuel breaks in the project area provide safe and strategic areas for firefighters to engage in suppression activities as they work to prevent the loss of human life, property, and habitat for special status species.

A fuel break is defined, by St John and Ogle (2009), as a strip or block of land on which the vegetation, debris, and detritus have been reduced and/or modified to control or diminish the risk of the spread of fire crossing the strip or block of land. The national Wildfire Coordination Group (NWCG) defines them 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).Although fuel breaks may not stop or put out a fire, they are expected to reduce flame lengths and slow the spread of wildfire. Reducing flame lengths and slowing the spread of a wildfire provides firefighters greater likelihood of successfully containing and controlling it. The proposed fuel breaks are to increase firefighter safety and increase their likelihood of success.

Firefighters have identified four characteristics of effective fuel breaks as:

- Strategically located - in readily accessible locations from which firefighters can establish safe anchor points for fire suppression tactics
- Landscape level - developed across the landscape to compartmentalize wildfires and are tied to existing features such as roadways
- Timely - meaning they are established, and functional when needed throughout the year. For instance, when surrounding fuels such as annual grasses are cured and readily carry flame, vegetation established in the fuel break needs to have a high moisture content to reduce fire spread, and be of short-stature to limit flame lengths
- Cost effective

The objectives are to:

- Increase firefighter safety and likelihood of success by creating areas from which they can safely anchor suppression actions.
- Reduce flame lengths, decreasing firefighter exposure to fire and the dangers associated with working near roadways.
- Reduce the risk to citizens and property.
- Reduce the amount of human caused fires along roadways from moving into adjacent wildlands.
- Protect existing native shrub habitat for slickspot peppergrass and greater sage-grouse, that would reduce the likelihood of large-scale wildfire, increase suppression options and help to keep fire compartmentalized.

1.3 Conformance with Applicable Land Use Plans

The project area is under the jurisdiction of the Kuna Management Framework Plan (MFP), Jarbidge Resource Management Plan (RMP), and the NCA RMP.

Objectives in the NCA RMP relative to the purpose and need include the protection of existing stands of native shrub habitat, reduce the size and recurrence of wildfires in the NCA, and increase shrub habitat through restoration. Management actions associated with these RMP objectives include the creation and maintenance of fuel breaks around areas where frequent fires threaten habitat. Although the Kuna MFP and the Jarbidge RMP do not have objectives specific to fuel breaks, the project is in conformance with objectives for habitat protection and fire suppression.

1.4 Relationship to Statutes, Regulations, and Other Requirements

- Proposed vegetation treatments would be tiered to the 2007 *Vegetation Treatments Using Herbicides on BLM lands in the 17 Western States Programmatic EIS* (USDI 2007a). The Record of Decision (ROD) for the Final EIS 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 or any herbicides that may be approved for use during the implementation of this project would be utilized. Herbicide treatment activities in the proposed action would follow the applicable Standard Operating Procedures identified in the ROD (Appendix 6.1.1). In 2005, a Boise District EA (EA# ID-100-2005-265**)** for Noxious and Invasive Weed Treatment was completed. This EA included the Jarbidge Field Office and addressed the impacts of herbicide use at the local level.

- Conservation Plan for the Greater Sage-grouse in Idaho (2006) and the 2010 BLM National Strategy. In the Idaho plan, the use of green strips was identified as infrastructure conservation measures on pages 4-43, item 3 and page 4-53, item 2.
- Instruction Memorandum (IM) 2011-138; Sage-Grouse Conservation Related to Wildfire and Fuels Management.
- IM 2012-044; National Greater Sage-Grouse Land Use Planning Strategy.
- U.S. Fish and Wildlife Service (USFWS), Biological Opinion, Bureau of Land Management (BLM) Existing Land Use Plans in the Boise and Twin Falls District Related to Slickspot Peppergrass Conservation-Ada, Adams, Boise, Canyon, Elmore, Gem, Owyhee, Payette, Twin Falls, Valley, and Washington, Counties, Idaho, November 2009.
- Conservation Agreement-BLM and USFWS-Idaho BLM Existing Land Use Plans and On-going Actions Affecting Slickspot Peppergrass-2013.
- *Oregon Trail Management Plan* – This plan outlines the BLM Boise Districts responsibilities in managing, protecting and interpreting the Oregon National Historic Trail. The plan was signed by the Boise District Manager in 1984.
- Cultural Resource Laws and Executive Orders - *State Protocol Agreement between the Idaho State Director, Bureau of Land Management (BLM), and the Idaho State Historic Preservation Office (SHPO)* regarding the manner in which the BLM will meet its responsibilities under the National Historic Preservation Act (NHPA) as provided for in the National Programmatic Agreement (NPA). This protocol implements the BLMs National Programmatic Agreement in Idaho by describing how Idaho SHPO and the BLM will interact and cooperate under the NPA in regards to the BLM Section 106 responsibilities under the NHPA.
- Executive Order 13186 expressly requires that Federal agencies evaluate the effects of proposed actions on migratory birds (including eagles) pursuant to NEPA "or other established environmental review process;" restore and enhance the habitat of migratory birds, as practicable; identify where unintentional take reasonably attributable to agency actions is having, or is likely to have, a measurable negative effect on migratory bird populations; and, with respect to those actions so identified, the agency shall develop and use principles, standards, and practices that will lessen the amount of unintentional take, developing any such conservation efforts in cooperation with the Service.

1.5 Scoping and Development of Issues

Subsequent to the Resource Advisory Council (RAC) symposium, the Boise District BLM met with the RAC sub-committee on several occasions to draft alternatives and discuss issues. On

November 17, 2011, the BLM formally initiated public scoping to interested publics to identify additional issues.

Relevant issues identified during internal and external scoping include;

- How can the BLM more effectively protect areas from wildfire?
- What are the potential impacts to the Oregon Trail from the proposed treatments?
- What is the potential for prostrate kochia (*Kochia prostrata*) to spread into slickspot peppergrass habitat and native plant communities?
- What are the effects to vegetation communities and wildlife habitat from the establishment of fuel breaks?
- What are the effects to soils from seeding and disking?
- What are the effects to air quality in the project area?
- What are the effects to visual resources, especially along the Oregon Trail?

2.0 Description of the Alternatives

2.1 Alternative Development Process

Following the 2011 symposium, the BLM identified the need to address the recurrence of wildfires in the project area. The BLM conducted internal and external public scoping to identify concerns and issues (Section 1.5). The proposed action was developed based on input provided by concerned publics, state and federal agencies, and environmental organizations.

The Boise BLM and the Idaho Natural Resource Conservation Service (NRCS) entered into a cooperating agency agreement to prepare this EA. The EA would serve as a programmatic document for NRCS to work with private citizens to develop fuel breaks on private lands within the project area. The NRCS would complete site-specific analysis known as an Environmental Evaluation, per the agency's NEPA implementation regulations. The NRCS would implement project actions on the private lands according to their authorities and management policies, and through their funding mechanisms. NRCS may also provide funding for implementation on BLM managed lands through contracts with permittees, with the concurrence of the BLM Field Manager. The BLM would implement the project on public lands in accordance with BLM guidance and direction for BLM funding. As such, the BLM would not complete surveys or analyze effects for private land, except in the cumulative effects section. The NRCS would complete surveys, provide analysis, and be responsible for compliance with NEPA and other environmental laws for actions on private lands. However, surveys and analysis will be completed as part of the Environmental Evaluation, which will not be conducted until NRCS has received an application for funding and must make a decision on their federal action of providing funding. If all land owners participated in fuel break development in conjunction with the proposed action, an estimated 133 miles of routes or 213 miles of fuel breaks would be developed on private land.

2.2 Alternatives Considered But Not Analyzed in Detail

The following alternatives were considered, but not further analyzed because they did not meet the purpose and need.

Alternatives without prostrate kochia were not analyzed. With budget limitations, it is most cost-effective to utilize and species best suited for a given area and that once established, require the least amount of maintenance to be effective.

An Alternative utilizing *only* targeted grazing was considered but not analyzed for the following reasons:

- Fuel breaks created by targeted grazing alone require the construction of four miles of temporary fence for each mile of fuel break (includes both sides of a route). The several hundred miles of temporary fence would be cost and time prohibitive to install and maintain. The amount of fencing required would have negative impacts to wildlife.
- To fulfill the criteria of being "timely" fuel breaks would need to be grazed during a short window of time when annual grasses have ceased actively growing. This would require a very large number of livestock turned out onto the treatment areas and removed as soon as biomass is depleted. In years with extended spring precipitation, it may be necessary to utilize the grazing treatment on more than one occasion to achieve effectiveness objectives. This would require livestock be brought back to the project area and temporary fences be put back up. For projects of this scale, logistics necessary for successful targeted grazing would be unattainable and they would not meet the criteria of being "timely".

2.3 Description of Proposed Action and Alternatives

Mileage calculations for the BLM portion of the project are slightly overestimated due to difficulties involved with breaking out mileages within intersections, which are double counted. Actual miles and acres treated would be less than what is identified for each action alternative. Additionally, route miles and fuel break miles are not equivalent because some routes would have both sides treated while others would only have one side treated.

Six alternatives were developed, including a No Action alternative, to meet the objectives described in Section 1.2. These alternatives vary by the amount of miles that would be developed into fuel breaks (Section 2.4). The preferred method of fuel break development for all alternatives is establishing fuel breaks of prostrate kochia. However, a variety of methods (tools) could be used, and are also considered, to develop fuel breaks. These different methods are identified in the description of the proposed action and analyzed for each resource. The differences between alternatives are those of scale and location of proposed fuel breaks.

For alternatives with reduced routes, an effort was made to remove routes with conflicting resource concerns; however, not all resource issues could be avoided in the reduced routes alternatives.

2.3.1 Alternative 1 - No Action

No new fuel breaks would be created and maintenance of existing seeded fuel breaks would not occur within the project area. Maintenance includes re-seeding herbaceous perennial species, herbicide application to reduce annual plant densities, or other activities to enhance the effectiveness of existing fuel breaks in the project area. Existing functional fuel breaks, such as those along the westbound I-84 near mile-post 85, would continue to provide some protection to wildlands from fires originating near the interstate. Existing fuel breaks, such as those along I-

84 near mile-post 101 would continue to be ineffective due to the level of annual grasses and forbs within the fuel break strip. Areas without fuel breaks would be vulnerable to the uncontrolled spread of wildland fire.

2.3.2 Alternative 2 – Proposed Action (All Routes)

A network of 294 miles of fuel breaks along 187 miles of routes on BLM, Bureau of Reclamation (BOR), and state lands from Blacks Creek to Glenns Ferry would be created to compartmentalize the 293,891-acre project area (Map 3). The miles of routes and fuel break miles differ because in some areas only one side of a route can be utilized by BLM due to land ownership. The fuel breaks would be up to 300 feet wide on either side of a route. Prostrate kochia would be the primary plant species used to establish vegetated fuel breaks except in areas with resource concerns. Areas not suitable for prostrate kochia use would incorporate one or more of the other methods analyzed in this EA.

While most fuel breaks would be developed along established roads, others may be developed along the Union Pacific rail line or along fences where the community of Tipanuk abuts public lands, and the east side of Mountain Home air base.

Project boundaries extend from Bonneville Point, east to Glenns Ferry and south from the foothills to the Union Pacific rail line (Map 1). Human caused fire starts are concentrated around major transportation corridors; therefore the network of fuel breaks would incorporate existing transportation corridors, establishing buffers between rights-of-ways and wildlands. The widths of fuel breaks would vary between 50 and 300 feet on each side of a route, depending on environmental constraints such as adjacent vegetation, geography, or soil type. For analysis purposes, the maximum width of 300 feet for the 294 miles has been assumed. This configuration would cover up to 10,690 acres adjacent to the 187 miles of routes. The final width and location of the fuel breaks would be determined upon completion of ground surveys for cultural, botanical, and wildlife resources. Adjustments would be made to minimize impacts to resources. In 2011, the Boise District BLM Fuels Staff evaluated routes in the project area to determine adequacy for use during fire suppression.

Established fuel breaks would reduce the number of human caused roadside ignitions that escape into adjacent rangelands. If prostrate kochia is not utilized in an area due to resource restrictions, an appropriate treatment method from the following list would be used to create a fuel break:

- Disking/bare ground,
- Mechanical thinning and mowing,
- Herbicide treatment,
- Targeted grazing (on a limited and site specific basis for development and maintenance of fuel break)s,
- Prescribed fire,
- Seeding short-statured, perennial plants other than prostrate kochia

Plant species used in seeded fuel breaks where the use of prostrate kochia is not possible or appropriate would incorporate low stature, low biomass plants that remain green into late summer, have a discrete growth form to create a discontinuous fuel load, and have a reasonable

likelihood of becoming established. Seed bed preparation would also be required and would implement any of the above tools. Proposed methods would be implemented as described in Section 2.3.2.1.

Following implementation, scheduled monitoring would occur to evaluate success of seedings and the need for additional treatments. Based on the results of the monitoring, additional treatments would be conducted to ensure a functioning fuel break becomes established. Where proposed fuel breaks cross private lands, land owners would be given the option of entering into Farm Bill program contracts with the NRCS to include those lands. NRCS would work with land owners to plan the appropriate treatment method used on each site.

Resource surveys on BLM, Bureau of Reclamation (BOR), and state lands were 400 feet wide on either side of routes and linear features to provide for potential shifting of the 300-foot fuel break width due to resource issues, geology, terrain, etc. The width of the fuel break would vary between 50 and 300 feet, within the 400-foot clearance area. Additional, cultural resource surveys would be required along the powerline if Alternatives 3 or 5 are selected.

For all alternatives, additional surveys may be required where the Oregon National Historic Trail is within the Area of Potential Effect (APE) or within 0.25 mile, to determine the exact location of the trail and if there is trail braiding. One year of surveys for special status plants has been completed; however Stage 2 and Stage 3 surveys for slickspot peppergrass would need to occur according to the design features in Section 2.3.2.1, as needed, depending on treatment method for areas designated as slickspot peppergrass habitat. Where rights-of-way exist, the project area will begin at the outer edge of that right-of-way. NRCS will conduct similar resource surveys on private and state lands where applications for Farm Bill program contracts have been received and approved.

The project would be implemented at an estimated rate of up to 100 miles per year at an initial width of up to 150 feet comprising an estimated 3,636 acres per year assuming implementation on both sides of routes. This initial implementation would be to establish a minimal effective fuel break across the project area, after which and where possible, the fuel breaks would be increased to the full 300 feet. Therefore, the analysis for all alternatives will be for the full 300 feet on both sides of the road. Due to the extent of the project, it is expected that implementation would occur over the course of several years, beginning in 2014.

2.3.2.1 Treatment methods common to all action alternatives

A variety of methods are available to reduce or modify vegetation to create fuel breaks. The methods analyzed in this EA include disking, mechanical thinning or mowing, herbicides, localized targeted grazing, prescribed fire for seed bed preparation, and seeding fire resilient vegetation. All methods would be implemented according to the design features outlined in the following section.

Disking – Disking or blading would be accomplished using a tractor or dozer with a blade or a series of discs to remove vegetation and expose bare mineral soil. Blading or disking may be used to establish containment lines on prescribed fires in preparation for seeding, or to create and maintain bare soil fuel breaks. Bare soil fuel breaks would be up to 50 feet wide on either side

of a road, and would disturb soil approximately nine inches deep. Bare soil fuel breaks would require annual or bi-annual treatment. Disking for seedbed preparation would be followed up with seed application.

Mechanical Thinning and Mowing – Thinning would be considered in areas with larger shrubs such as sagebrush, where there is a need to maintain the native vegetation and visual integrity, or in sensitive areas where minimal ground disturbance is desired. Shrubs would be selectively thinned using chainsaws and removed from the site, or pile burned when appropriate environmental conditions occur (i.e. wet or frozen soils). Mowing would be accomplished using a mower attached to a rubber-tired tractor, and vegetation would be mowed to a height of 6 to12 inches. Areas treated by thinning and mowing would likely be followed up with herbicide treatments to reduce invasive annual plants, or noxious weeds. Subsequent to mowing, and herbicide treatments some areas may require seeding to facilitate meeting objectives. Mowing would occur during fall and winter months when there is less likelihood of fires being ignited by mowing operations.

Herbicides – Both pre- and post-emergent herbicides would be utilized to effectively control targeted species. Pre-emergent herbicides (applied to soils to prevent the germination or early growth of targeted plant seeds) would be used to reduce competition with invasive annual grasses in seeded fuel breaks, and to maintain the effectiveness and integrity of established fuel breaks. Post-emergent herbicides (herbicides requiring contact with live plant tissue to be effective) would be employed to control noxious weeds and reduce competition in preparation for seeding a fuel break.

A programmatic environmental impact statement (PEIS), Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States (USDI BLM 2007a), was completed in 2007, which analysed the use of herbicides on public lands managed by the BLM. The analysis for herbicide use, proposed in this EA, is tiered to the PEIS. The relevant standard operating procedures regarding herbicide use are identified in the ROD and are included in Appendix 6.1.1.

Only ground-based application methods would be employed. Nine herbicides are proposed for use (Table 2.1). Herbicides would be applied according to label recommendations and the standard operating procedures outlined in the PEIS.

Table 2.1 - Herbicides Proposed for use

Herbicide	Herbicide Characteristics*
2,4-D	Selective; foliar absorbed; post-emergent; annual/perennial broadleaf weeds
Chlorsulfuron	Selective; inhibits enzyme activity, broadleaf weeds and grasses
Clopyralid	Selective, mimics plant hormones; annual and perennial broadleaf weeds
Dicamba	Growth regulator; annual and perennial broadleaf weeds and grasses
Imazapic	Selective pre and post-emergent systemic; inhibits annual grasses and some perennial grasses and broadleaf forbs
Glyphosate	Non-selective systemic, annual and perennial grasses and broadleaf weeds, sedges, shrubs, and trees
Metsulfuron methyl	Selective; post-emergent; inhibits cell division in roots and shoots; annual and perennial broadleaf weeds, brush, and trees

Herbicide	Herbicide Characteristics*
Picloram	Selective; foliar and root absorption; mimics plant hormones; certain annual and perennial broadleaf weeds, vines, and shrubs
Triclopyr	Growth regulator; broadleaf weeds and woody plants

*Information compiled from (USDI BLM 2007a)

Targeted Grazing – Targeted grazing by cattle, sheep, and/or goats would be used to reduce the amount of fuels where other methods cannot be used such as steep or rocky areas. Targeted grazing is defined as "livestock grazing at a determined season, duration, and intensity to accomplish defined vegetation or landscape goals" (Launchbaugh 2006, BLM 2007). This method would require fencing to confine the animals within the treatment area and be completed during the growing season on an as needed basis, depending on temperatures and precipitation. Targeted grazing could also be used to prepare an area for seeding. Goats or other livestock could be used to consume and break down areas with thick mats of medusahead.

Prescribed Fire – This method would be used in areas dominated by invasive annual grasses. Burning would remove the dense mat of accumulated biomass associated with medusahead and expose the remaining seeds to direct herbicide contact. The fire would be contained within the treatment area using the existing roads, Class A foam[1], or disking a fuel break on the edge of the proposed seeding. Prescribed fire would be utilized when conditions meet the prescription criteria in the late fall, winter, or early spring.

Seedings – Seeded fuel breaks would be created by removing existing vegetation and planting vegetation that reduces fire behavior and slows the spread of fire. Prescribed fire, disking, or herbicides could be used to reduce the biomass of existing vegetation. A standard rangeland drill would be utilized to establish seeded species in areas where there are no limitations due to resource concerns such as slickspot peppergrass or erosive soils.

In areas with slickspot peppergrass, erosive soils, or near the Oregon Trail, a standard rangeland drill fitted with depth bands or a minimum-till drill would be used. With these types of seed drills, the depth of the furrow is controlled minimizing soil disturbance. Typically, minimum-till drills create furrows one inch or less deep or broadcast seed onto the soil surface and press seed into the soil surface with the use of an imprinter attachment. A standard rangeland drill creates an average furrow depth of 2-4 inches in firm soils and as deep as 6 inches in loose or unstructured soils. If a fuel break is seeded by hand, a small chain may be dragged over the area to work the seed into the soil.

Plant species analyzed for fuel breaks include prostrate kochia, Sandberg bluegrass (*Poa secunda*), bottlebrush squirreltail (*Elymus elymoides*), dwarf yellow rabbitbrush (*Chrysothamnus viscidiflorus*). A comparison of characteristics of plants used for fuel breaks is presented in Table 2.2. Cultivars specifically developed for use within the area would be selected to enhance

[1] *Class A foam is a biodegradable mixture of foaming and wetting agents that utilizes a surfactant to augment the effectiveness of water in suppression efforts. In light fuels, this foam can be an effective control line for prescribed fire.*

establishment potential. St John et al. (2009) listed the most effective characteristics for fuel break vegetation as:

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

Advantages and disadvantages of each Plant species considered for seeding of fuel breaks where prostrate kochia is not suitable include the following:

Sandberg bluegrass

A short-statured native perennial grass, Sandberg bluegrass initiates growth early in the spring, similar to the same time that cheatgrass initiates spring growth. Because of this similar phenology, Sandberg bluegrass can persist in areas dominated by cheatgrass, and in some instances it may reduce the amount of cheatgrass in an area. However, rarely does it reduce cheatgrass density to the level, that in years with climatic conditions that favor cheatgrass growth it keeps it from becoming dominant. Although it is a perennial species, Sandberg bluegrass sets seed and enters dormancy early in the summer, when temperatures turn hot, then re-grows in the fall if precipitation and temperatures are compatible. This early dormancy results in very dry biomass during the summer.

Bottlebrush Squirreltail

A short-lived, low to mid-statured native perennial grass, Bottlebrush Squirelltail is persistent in a plant community that is dependent on its ability to reseed itself.

Prostrate kochia

Prostrate kochia has been shown to be very effective at reducing the rate of spread and intensity of wildfires (Harrison et al. 2002, Monsen and Memmott (1999),Monsen 1994). Gray and Muir (2013) found kochia "abundance to be positively associated with biological crust cover and negatively associated with litter" and cheatgrass; characteristics that would aid in its effectiveness as a fuel break. Prostrate kochia has also been documented to re-sprout following fire (McArthur et al. 1990, Harrison et al. 2002).

Advantages of prostrate kochia for fuel breaks include;

- stays green and has high moisture content late into the fire season; reducing fire intensity
- has competitive advantage over invasive annual weeds
- high protein forage utilized by wildlife and domestic animals
- resprouts following fire
- requires minimal maintenance
- suitable for the climate and soil types in the project area
- effectively controlled by herbicides

- adapted to arid, saline, and impoverished sites

The potential disadvantages include:

- potential to spread from original planting
- non-native species
- can be a challenge to establish
- non-mycorrhizal
- establishes in slickspots and playas within seedings
- potential to compete with slickspot peppergrass plants

While there are concerns regarding prostrate kochia, this plant 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 is well adapted to arid regions and is competitive against invasive annual plants (NRCS 2006). Monsen and Memmott (1999) documented fire burned two feet into prostrate kochia test strips before it ran out of fuel, even though wind speed was 16.3 mph. They also reported that only when winds exceeded 20-25 mph, and plots contained litter, did the fire burn slowly and erratically through the prostrate kochia plots.

Table 2.2 - Comparison of Fuel Break Plant Traits

Trait	Desirable +	Desirable -	Sandberg Bluegrass	Bottlebrush Squirreltail	Prostrate Kochia	Dwarf Rabbitbrush
Fire Resilience**	++		X	X	X	X
Drought Tolerance	+		X	X	X	X
Saline Tolerance		-			X	
Maintenance		-	Herbicides	Herbicides	Grazing	Mowing
Potential to Spread	+		X	X	X	X
Locally Adapted	++		X	X	X	X
Green in Summer	++				X	X
Outcompetes/Excludes invasive annual plants	++				X	
Establishes on impoverished sites	+		X		X	X
Small stature/Low biomass	+		X	X	X	X***
Effectively controlled by herbicides	+		X	X	X	X
Effectively reduces flame lengths	++		X	X	X	X
Effectively reduces rate of fire spread	++				X	

+ signifies desirable fuel break trait, ++ signifies a very desirable fuel break trait, - signifies an undesirable fuel break trait
***resprouts following fire*
****dwarf only*

2.3.2.2 Design Features of the Proposed Action

Design features have been created as a means to minimize or eliminate adverse impacts to the various resources for which the proposed action may present issues.

Soils

- Mowing, drill seeding, or targeted grazing would not occur when soils are saturated and easily rutted.
- Soils with wind erodibility index value (WEI) of 134 or greater, (i.e. sandy sites) minimum till drill or rangeland drill with depth bands will be used to seed fuel breaks to minimize soil disturbance.
- Herbicides to control invasive annual grasses, will not be used on soils with a WEI value of 134 or greater unless adequate vegetative cover is present on-site to reduce the potential of erosion (e.g., release of perennial plants)
- Disked-in fuel breaks will be maintained on a yearly basis or would be converted to a vegetated fuel break if yearly maintenance is found to be too time consuming and/or expensive.

Vegetation/Weeds

- Disturbed areas will 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) and the ROD for the Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement (USDI BLM 2007b).
- Herbicide will be applied using a truck, tractor, or ATV/UTV mounted sprayer. 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.
- Existing noxious weed populations will 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 will avoid wetland or riparian zones (i.e. where riparian vegetation species exist).
- Mowed fuel breaks will be maintained (re-mowed) when sagebrush has achieved re-growth to an average height of 15 inches.
- Debris piles created during thinning operations will be limited in size to no larger than 15 feet in diameter and 10 feet in height and will be ignited when burn prescription conditions are appropriate (i.e. soils are either wet or frozen).

Air Quality

- To ensure Clean Air Act compliance, burning would be conducted in accordance with the *Montana/Idaho State Airshed Group Operating Guide* (August 2003).
- Site preparation for seeding using prescribed fire would be conducted by BLM personnel when weather and wind conditions are appropriate.

<u>Special Status Plants (specifically slickspot peppergrass)</u>

Layout

- Fuel breaks within existing slickspot peppergrass EOs and occupied habitat would be designed and laid out in coordination with US Fish and Wildlife Service.
- Any fuel break implementation operation within an existing slickspot peppergrass EO or occupied habitat would be overseen by a botanist or qualified botany technician.
- Within EOs, slickspots with slickspot peppergrass plants in them will be marked to aid crews in avoiding these slickspots.

Surveys (USDI FWS & BLM 2013)

As of August 2013 Stage 1 surveys were completed; all Potential Habitat within the project treatment footprint was re-classified as slickspot peppergrass habitat due to survey findings.

- A minimum of one year of surveys (Stage 1) have been completed within the project area in all slickspot peppergrass habitat types.
    - If no slickspots were found during Stage 1 surveys in potential habitat, that area was no longer considered habitat.
    - If during the Stage 1 surveys slickspots were found but no slickspot peppergrass plants were found, two additional of years surveys (Stage 2 and Stage 3) in which no slickspot peppergrass plants are found will be necessary in order to identify habitat as unoccupied. Presence or absence of slickspot peppergrass plants can only be determined for years in which spring precipitation (March-May) during the year in which they were conducted is at least 60% of average spring precipitation. This would be approximately 2.4 inches from March 1 - May 31 in the Boise area and 1.4 inches in the Glenns Ferry area.

Herbicide

- Ground–based herbicide application within occupied habitat would; be limited to wind conditions less than 7 miles per hour, use large droplet spray with reduced pump pressure, and use spot spraying techniques to prevent drift of herbicide into slickspot peppergrass habitat (USDI BLM 2006).
- Within boundaries of slickspot peppergrass element occurrences, herbicide will only be applied using hand sprayers (USDI BLM 2006).
- Herbicide applications would avoid off-site movement of herbicides either through the air, soil, or over the soil surface. Terrain, soil type, and vegetation will be taken into consideration when selecting herbicide type, application method, and application timing (USDI BLM 2006).
- In occupied habitat that co-occurs with high-ignition areas, and in coordination with FWS, herbicide would be applied up to the edge of individual occupied slickspots.
- During the application of herbicide within EOs, barriers such as plastic sheeting, tarps, or plywood boards would be placed between herbicide spraying and slickspots to minimize the potential for any chemical drift to come into direct contact with slickspot peppergrass plants. Slickspots would be covered for minimal periods of time to avoid mechanical and heat damage to individual plants (USDI FWS 2011).

Targeted Grazing

- Would not occur within slickspot peppergrass EOs.

- Would not occur when soils are saturated (USDI FWS & BLM 2013); there would be no evidence of puddles (i.e. standing water) and the soil within slickspots would be firm (i.e. a boot heel would not penetrate more than 0.5 inches) (USDI FWS & BLM 2013). Pertains to slickspots within occupied habitat but outside of an EO, and all slickspot peppergrass habitat.
- Livestock would not be allowed to gather, trail, or bed within slickspots of occupied or slickspot peppergrass habitat.

Disking

- Would not occur in occupied habitat.
- Would not occur in slickspot habitat until Stage 1-3 surveys have been completed and the area is confirmed to be unoccupied.

Mechanical Thinning and Mowing

- Occupied habitat would be thinned or mowed on a site-specific basis with input from FWS and BLM botanists.
- Mowing in slickspot peppergrass habitat would only occur when slickspot soils are frozen. If soils are not frozen during mowing then slickspots will be avoided.

Prescribed Burning

- Operational equipment would avoid slickspots in occupied and slickspot peppergrass habitat, to protect against potential compaction and soil displacement.

Seeding

- Seed mixes would give native species priority in occupied habitat (USDI FWS & BLM 2013). Native forbs that meet fuel break criteria would be used in occupied habitat when practical and if available.
- Minimum-till drills or standard rangeland drills with depth bands would be used in both occupied and slickspot peppergrass habitat.
- Prostrate kochia would not be utilized for seeded fuel break treatments in occupied habitat (USDI BLM 2012, USDI FWS 2012).
- Prostrate kochia would be considered for use in slickspot peppergrass habitat only if site-specific conditions and analyses determine that its use would result in large-scale benefits of reducing large fire frequency and spread, with low risk to slickspot peppergrass and its habitat (USDI FWS & BLM 2013 USDI BLM 2012).
- If prostrate kochia is used as a fuel break within one mile of occupied habitat, or in slickspot peppergrass habitat the following monitoring and control protocol would apply. This monitoring protocol would not apply to older, existing seedings of prostrate kochia.
    - Monitoring transects would be placed in both treated and adjacent areas to evaluate plant establishment and prostrate kochia spread. Monitoring methods would include field observations, photo plots, and line point intercept transects to assess cover and density. Monitoring would occur for three consecutive years following treatment, then at five year intervals to evaluate long-term effects.
    - Prostrate kochia spread would be evaluated based on the occurrence of plants in untreated areas. Plants occurring outside of the treated areas would be removed or spot treated with application of chemical using Bureau-approved herbicides.

Cultural Resources

- Herbicides may be applied on National Register listed or eligible sites either through the use of hand sprayers or UTV/ATV mounted sprayers. UTV/ATV use across a site will only be done when the soils are not wet or saturated.
- Seeding in National Register eligible sites will be accomplished through hand seeders, or UTV/ATV mounted seeders. Seeding may be done within a site on a site by site basis with a minimum till drill or a standard rangeland drill with depth bands when the soils are not wet or saturated.
- Certain National Register listed or eligible sites may be burned over dependent upon the nature of the artifacts or features present in each specific site. Which sites can be burned over will be looked at individually.
- No disking will occur in any archeological site.
- Avoidance of National Register listed or eligible sites would be accomplished by flagging the site or through construction of a temporary fence. Temporary fencing to exclude an archeological site area from targeted grazing will be placed in consultation with a BLM archeologist or the NRCS Cultural Resource Specialist on private and state lands.
- Any fuel break treatments occurring within an archeological site will be pre-approved in consultation with the Idaho SHPO.

Standards Specific to the Oregon Trail

- Drill seeding will not occur within 100 feet of trail remnants.
- Trail remnants will not be disturbed during seeding or mowing. Mowing and or seeding will be parallel to trail ruts and will not occur within the trail corridor.
- Thinning of vegetation along the trail corridor will be by hand leaving pockets of vegetation in a mosaic pattern.
- Prescribed burning or other vegetative manipulation practices within a 0.5 mile protective corridor along visible remnants of the trail would be planned and conducted in such a way as the finished product resembles natural vegetative patterns.
- The use of non-native vegetation may be acceptable in areas that have previously burned and where it will have a beneficial effect by protecting the trail. The use of native vegetation is preferred where the visual integrity of the trail is more intact. .
- Treatment actions along the OR Trail will be determined on a segment by segment basis in consultation with the Idaho SHPO.
- Given the nature of the Oregon Trail, many vague braided routes and alignments, additional pedestrian surveys are required to fully identify all segments of the trail and their relationship to the proposed project. Fuel break locations scheduled for implementation in proximity to the OR Trail will be defined one year in advance of actual implementation in order for the BLM Archeologist to define the exact location of the trail, identify appropriate treatments along the trail, and complete the Section 106 compliance in consultation with the ID SHPO.

Wildlife Habitat

- Treatments would not occur within three miles of an 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.
- Mow strips in PPH or within one mile of an active occupied sage-grouse lek would not be wider than 50 feet on each side of a route. Beyond the 50 feet of mowing in PPH, sagebrush may be thinned by hand to approximately 5 - 10% canopy cover for another 50 feet. Mow strips in PGH would not be wider than 100 feet on each side of a route and sagebrush may be thinned by hand beyond the 100 feet of mowing in PGH to approximately 5 - 10% canopy cover for another 100 feet.
- Bare soil (disked) fuel breaks would not be greater than 25' widewithin PPH or PGH or within one mile of an active and occupied lek.
- Temporary fence construction, where needed, would be at least 1.25 miles away from 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.
- NRCS-funded projects on lands within sage-grouse habitat will incorporate the Conservation Measures for the Firebreak Conservation Practice identified in the Conference Report for the Natural Resources Conservation Service Sage-grouse Initiative (SGI, see Appendix 0).
- Mowing of sagebrush would not occur from March 1 through July 31 to protect nesting migratory landbirds.
- Surveys for pygmy rabbits would be repeated in potential habitat one week prior to mowing sagebrush. Mowing would not occur within 50 feet of occupied burrows.
- If pygmy rabbits are found, there would be no broadcast spraying of 2,4-D within 100 yards of active burrows. Only spot application would be used within 100 yards of active burrows.
- If pygmy rabbits are found, no application of herbicides within 100 yards of active burrows would occur from one hour before sunset to one hour after sunrise, to minimize direct contamination.
- Surveys for raptor nesting activity would be completed two miles out from any site with proposed equipment operation (tractors, chainsaws) between January1 and March 1. Nest sites identified as active during that period would be protected by establishing a buffer of not less than 0.5 miles. Established buffers would remain in effect from determination of an active nest through July 31.
- Soil disturbance would not occur within the greenline of streams and wetlands to protect riparian habitat and to protect streams and habitat occupied by redband trout.

Visual Resource Management – Class I areas

- In areas with intact sagebrush stands adjacent to treatment routes, hand thinning would be the primary method to reduce fuels. Thinning objectives would be to create a natural appearing, open sagebrush canopy near the roads edge which gets thicker as one moves away from the road. Target canopy cover would be 2–5 percent within 25 feet of a road's edge. Beyond 25 feet thinning would taper from 5 percent to 25 percent canopy at 100 feet from road's edge.

Monitoring

Monitoring for establishment and effectiveness would occur annually for the first five years post treatment, then every 3 years for 9 years, then every 5 years thereafter. Areas where establishment was unsuccessful or patchy would receive additional treatments to ensure effectiveness.

2.3.3 Alternative 3 – All Routes Excluding Mayfield Road

Approximately 275 miles of fuel breaks would be established on 177 miles of routes. It is the same as Alternative 2 with the exception of the northern boundary which changes from the Mayfield Road to the northern most powerline right-of-way located to the south of Mayfield Road (Map 4).

The access road along the power line would be improved sufficiently to enhance firefighter access and fuel break establishment. The Mayfield Road is designated by the State of Idaho as a backcountry byway and is recognized as the route of the Oregon Trail. This alternative was developed to reduce potential impacts to sensitive areas such as the Oregon Trail. If fuel breaks were created up to the maximum width of 300 feet for the 275 miles, they would cover approximately 10,000 acres.

2.3.4 Alternative 4 – Reduced Routes

Approximately 221 miles of fuel breaks would be established on 141 miles of routes (Map 5). There would be fewer interior routes with fuel breaks and no fuel breaks would be developed south of Interstate 84 as identified in Alternative 2. This reduced amount of miles is proposed to establish fuel breaks in a more timely manner and reduce costs. Although this reduction does not avoid all sensitive areas, the routes removed from consideration were selected based on their proximity to occupied slickspot peppergrass habitat and private land. If fuel breaks were created up to the maximum width of 300 feet for the 221 miles, they would cover approximately 8,036 acres.

2.3.5 Alternative 5 – Reduced Routes Excluding Mayfield Road

Approximately 212 miles of fuel breaks would be established on 137 miles of routes. The northern boundary changes from the Mayfield Road to the first major power line right-of-way south of Mayfield Road east to Idaho Hwy 20 (Map 6). If fuel breaks were created up to the maximum width of 300 feet for the 212 miles, they would cover approximately 7,708 acres.

2.3.6 Alternative 6 – High Human Ignition Areas

Approximately 87 miles of fuel breaks would be established on 84 miles of routes along Interstate 84, Highway 20, and the Union Pacific rail line south of Mountain Home (Map 7). Eighty percent of the human caused fires start along these routes. Fuel breaks created at the maximum width of 300 feet would cover approximately 3,163 acres.

2.4 Comparison of Alternatives

Table 2.3 - Miles and roadside acres by alternative

Alternatives	Miles of Fuel Breaks	Maximum Potential Acres
Alt 1 - No Action	0	0

Alt 2 – Proposed Action	294	10,690
Alt 3 – All Routes Except Mayfield RD	275	10,000
Alt 4 – Reduced Routes	221	8,036
Alt 5 – Reduced Routes Except Mayfield RD	212	7,708
Alt 6 – High Human Ignition Areas	87	3,163

3.0 Affected Environment and Environmental Consequences

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 addressed further in this document.

- wild and scenic rivers,
- wilderness,
- areas of critical environmental concern,
- minority or economically depressed populations,
- water quality,
- wetlands and riparian zones,
- paleontology,
- adverse energy impacts, and
- hazardous materials.

This section provides an evaluation of the baseline condition of elements of the human environment potentially affected by the alternatives. The evaluation is a description of the elements' current condition, consequences, or expected implementation effects of each alternative.

The analysis of the potential impacts to the human environment is presented first according to the effects of each proposed tool and method of fuel break development, then by the alternatives and the extent of expected effects.

Analyses of cumulative impacts and the scope for each resource are also presented. Cumulative effects describe impacts of the alternatives when added with other past, present, and reasonably foreseeable future actions (40 CFR 1508.7).

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

1. Fuel Break Development – The NRCS will be working with landowners within the project area to develop fuel breaks on private land to connect into BLM fuel breaks. Depending on landowner participation, approximately 133 miles of routes (213 miles of fuel breaks) could be developed for fuel breaks to complete the network of fuel breaks across the landscape.
2. Livestock Grazing and Trailing – 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. In the project area, trailing may occur within 0.125 miles (660 feet) of trailing routes, which are usually existing roads, unless the specific trailing event would not conflict with the proposed action treatment objectives. Overnight areas would be designated on specific permits, as necessary. Trailing would follow stipulations identified in the Trailing EA (Environmental Assessment DOI-BLM-ID-B010-2012-0003-EA).

3. Noxious Weed Treatment – The project area is largely within the Southfork Boise Cooperative Weed Management Area (CWMA). The BLM and cooperators work together to identify, monitor, and treat noxious weeds across ownerships. This cooperative is expected to continue into the foreseeable future, but is dependent on funding from cooperators. Weed treatments consist of mechanical, biological, and chemical methods as described in the Noxious and Invasive Weed Treatment EA (Boise District and Jarbidge Field Offices EA #ID-100-2005-EA-265), and Vegetation Treatments using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement (PEIS) (USDI BLM 2007a), including Appendix B of that document – Standard Operating Procedures (Appendix 6.1.1).
4. Gateway West Transmission Lines – Gateway West Project is a proposal to construct 1,103 miles of electrical transmission lines from Glenrock, Wyoming to Hemmingway Butte in Idaho. Although the preferred or proposed routes for the power lines cross through the cumulative effects analysis area, none actually cross the project area. The decision on routes through SW Idaho, including the project area, is scheduled for November 2014.
5. Recreation – Several forms of dispersed recreation are popular throughout the project area, including camping, hiking, driving, hunting, biking, birding, off-highway vehicle riding (OHV), and shooting. Most recreation occurs in the fall during annual hunting seasons for pronghorn antelope, elk, deer, chukar, and sage-grouse. For most resources, there would be no cumulative recreation effects.
6. Wildfires – Wildfires have led to considerable negative impacts by consuming native vegetation and enhancing conditions for non-native annual grasses to invade.
7. Residential Development – A planned community is proposed near the town site of Mayfield. However, there is uncertainty of what will eventually occur and progression of the development is speculative, therefore, a detailed or thorough analysis is not possible at this time.
8. Interstate 84 and Highway 21 Right of Way Fuel Breaks and Seeding – The Idaho Department of Transportation has been working with the BLM to develop fire resistant shoulders along the interstate right-of-way to keep fires from igniting. They have also been grading roadsides to remove vegetation and treating annual grasses and forbs with herbicides. Areas treated with herbicide have been reseeded with perennial plants to enhance the appearance of the interstate corridor. This work is within the disturbed highway right-of-way and appropriate mitigations were established to minimize impacts to resources.

3.1 General Vegetation including Noxious and Invasive Weeds

3.1.1 Affected Environment

3.1.1.1 General Vegetation

Expected vegetation within the project area, based on soils, climate, and natural disturbance regime would be approximately 81% classified as Loamy 8-12 inch precipitation zone dominated by Wyoming big sagebrush with a bluebunch wheatgrass (*Pseudoroegneria spicata)*/Thurber's needlegrass (*Achnatherum thurberianum)* understory. This expected plant community is determined, based on soils, climate, and natural disturbance regime. Two other notable ecological sites of notable extent within the project area are; the Sandy loam 8-12 inch precipitation zone (eight percent of project area). This ecological site is typically dominated by Wyoming big sagebrush with a bluebunch wheatgrass/Thurber's needlegrass/needle and thread grass (*Hesperostipa comata* ssp. *comata*) understory. Two percent of the project area is characterized as a Shallow Loamy 8-12 inch precipitation zone dominated by Wyoming big sagebrush with a bluebunch wheatgrass understory (2%). Twelve additional ecological sites describe the remainder of the public land within the project area. Soils in the project area have developed from historic lakebed, river, and wind-blown deposits and have a high percentage of silt in the soil surface layer.

Tagestad and Downs (2007) updated a 2002 vegetation mapping effort utilizing Landsat satellite imagery in 2007 and they classified approximately 47% of the public land within the project area as "Exotic Annuals", and the remainder identified as "Big Sage" (23%), "Big Sage Mix" (12%) and "Bunchgrass" (8%) (Map 8).

The majority of BLM-managed land within the project area has been surveyed for the presence of slickspot peppergrass habitat. Data from these surveys indicate that approximately 30% of the BLM managed land within the project area is currently dominated by cheatgrass, medusahead or other annual invasive plants. On an additional 25% of the area surveyed, cheatgrass is either a major component of the understory or is subdominant with Sandberg bluegrass, crested wheatgrass, or other annual invasive plants.

Disturbance and Fire History

As described in Section 1.1 there have been hundreds of wildfires within the Paradigm project area since the late 1950s. A large percentage of these areas have burned more than once. Much of the area affected by wildfire has been invaded to varying degrees by invasive annual grasses (cheatgrass and medusahead) and/or other weeds such as tumble mustard (*Sisymbrium altissimum),* Russian thistle (*Salsola kali),* and bur buttercup *(Ceratocephala testiculata).* Many annual plants germinate in the fall, overwinter, and emerge in the spring with an established root system. This growth habit allows annual plants to take advantage of available early spring moisture, giving them a competitive advantage over the native species. Following disturbance, such as wildfire or heavy livestock grazing, plant communities experience an increase in annual grasses and forbs. With repeated disturbance, exotic annual plants sometimes become the dominant species. In the project area where shrub stands still occur, cheatgrass, medusahead and/or bur buttercup are a common component of, or dominate the understory.

Approximately 44,100 acres burned in wildfires have been seeded post-wildfire in the project area, with varied establishment success. Common species used in post-fire rehabilitation efforts have included; Snake River wheatgrass (*Elymus wawawiensis*), crested wheatgrass (*Agropyron cristatum)*, Siberian wheatgrass (*Agropyron fragile)*, Sandberg bluegrass (*Poa secunda*), bottlebrush squirreltail (*Elymus elymoides*), and Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis)*. In the 1980's and 1990's, prostrate kochia was planted as a fuelbreak species in strips of varying widths (300-600 feet) along Interstate 84 (just outside the right-of-way) between the Simco and Hammett exits. This species was also occasionally included in post-fire rehabilitation aerial and drill seed mixes.

Livestock grazing has occurred since pre-settlement times in SW Idaho and the majority of the northern boundary of the project area follows routes of the historic Oregon Trail.

3.1.1.2 Noxious weeds

Within or immediately adjacent to the project area, the following noxious weeds are known to occur; rush skeletonweed (*Chondrilla juncea*), whitetop (*Cardaria draba*), squarrose knapweed (*Centaurea triumfetti*), diffuse knapweed (*Centaurea diffusa*), Russian knapweed (*Acroptilon repens*), Canada thistle (*Cirsium arvense*), Scotch thistle (*Onopordum acathium*, field bindweed (*Convolvulus arvensis*), perennial pepperweed (*Lepidium latifolium*), poison hemlock (*Conium maculatvum*), and tamarisk (*Tamarix* sp.). Control treatments for these species are accomplished through partnership in the local CWMA. Plant species identified as "weedy" are uniquely adapted to increase in numbers and spread into uninfested areas following disturbances and have the potential to alter soil stability or plant community diversity.

3.1.2 Environmental Consequences

3.1.2.1 General Effects

By design, existing vegetation within the footprint of the fuel breaks would be eliminated to develop the prescribed treatments by blading or disking of brownstrips, targeted grazing, or seeding new species such as prostrate kochia. Seeded species would generally replace existing native species to ensure fuel breaks consist of low statured, competitive, fire resilient species. Most existing bunchgrasses and forbs would not survive treatments involving high levels of soil disturbance or yearly maintenance (i.e. disking, targeted grazing). An exception however, would be Sandberg bluegrass, which produces short rhizomatous roots and is therefore better suited to survive moderate amounts of disturbance. Herbicide treatments to control competition would kill targeted invasive annual grasses and forbs. Repeated maintenance mowing, over time may result in mortality of existing sagebrush plants within the footprint of the fuel break. Thinning operations, depending on initial density in bitterbrush stands, would remove approximately 50-60% of the mature shrubs.

Currently, nearly half of the project area, as well as the Proposed Action footprint, are mapped as exotic annual species with few to no shrubs (Map 8). The loss of established native and non-native perennial plants from the treatment footprint and the replacement with seeded fuel break species would be a trade-off for the increased capability to reduce fire frequency and size within and adjacent to the project area thereby protecting existing native plant communities as well as past and future fire rehabilitation and restoration investments.

3.1.2.2 Alternative 1 (No Action)

Without a strategic network of fuel breaks to facilitate containment and reduction the amount of acres burned annually, large and/or frequent wildfires are expected to occur across the project area, based on fire trends over the last 30 years. Fire years such as 2012, when approximately 60,065 acres burned in and adjacent to the project area would continue to remove existing stands of native plant communities and likely result in conversion to more acres of non-native annual grasses and forbs. Loss of these remnant stands reduces and eliminates important local seed sources for natural recovery and limits the potential for restoration. Subsequent to wildfires, public lands are rested from livestock use, and can be closed to public access, to allow perennial plant recovery and/or residual biomass accumulation for soil protection. The period of closure and rest, provides perennial vegetation an opportunity to recover without additional disturbances and promotes plant and watershed recovery. Based on recent climatic trends, success of rangeland rehabilitation treatments is difficult to achieve and even when successful these seedings are often invaded by non-native annual grasses and forbs while seeded perennial species become established. Successful restoration treatments (to re-establish a native perennial plant community), would likely require several years to successfully establish.

3.1.2.3 Alternative 2 -Proposed Action (All Routes)

This alternative prescribes a total of 10,690 acres to be converted into fuel breaks in the 300-foot wide treatment footprint. Based on Tagsted and Downs interpretation of 2007 satellite imagery, of those 10,690 acres, approximately 3,987 acres would be in exotic annual grasslands, 4,698 acres would be in big sage or big sage mix, and 1,145 acres would be in bunchgrass. The remaining 860 acres would occur in rabbitbrush, salt desert shrub, seedings, and other minor cover types.

Disking - The direct effect of disking to create a fuel break would be the removal of most if not all existing vegetation from a 50-foot wide treatment footprint. Design features for fuel break maintenance in the proposed action would reduce the potential for invasive annual plants 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.

As a seedbed preparation technique, the direct effects of disking would be the removal of most, if not all, existing vegetation from the treatment footprint and a temporary (one to two year) increase in invasive annual plants and/or noxious weeds on-site if present in the area. Over the long-term however, removed vegetation, invasive annual plants, and/or noxious weeds would be replaced by seeded species. An indirect effect of disking, for seedbed preparation, 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.

Mechanical or Mowing - The direct effect of thinning, using chainsaws or other mechanical tools, to create fuel breaks is the reduction in density and canopy cover of shrubs within the treatment footprint. Removal of up to 60% of the shrubs could occur depending on initial shrub density.

Mowing would remove shrub branches and foliage over 6-12 inches high in the treatment footprint. Removing the shrub canopy often results in an increase in young plants for several years following treatment. Mowing would be repeated as shrub canopies regrow and exceed the 12 inch height. Repeat mowing can result in a decrease in vigor and mortality.

A decrease in shrubs could result in an increase in vigor of existing understory herbaceous species, including invasive annual plants and/or noxious weeds within the treatment footprint (Davies et al 2011). Herbicide application either before or after a mowing treatment to control invasive annual plants and/or noxious weeds where they exist would minimize this indirect effect.

An indirect effect of thinning or mowing vegetation to create fuel breaks would 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.

Herbicide – This treatment could be used as either an interim measure to prepare a site for seeding, or to maintain a treatment. As an interim measure, any vegetation within the fuel break footprint would be targeted. As a maintenance treatment, target vegetation would be invasive annual grasses and forbs, noxious weeds, and weedy species.

The direct effect of a pre-emergent herbicide treatment to maintain fuel breaks once they have been established is the control of undesirable invasive annual grasses and the subsequent increase in density and vigor of existing planted species due to lowered competition levels over time. The herbicide treatments to kill target vegetation and the extent of disturbance to non-target vegetation would vary by the chemical used (post-emergent vs. pre-emergent), the timing of application (plant growing season vs. dormant season), as well as vegetation 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 risk of harming or killing non-target vegetation off-site is minimized to an acceptable level by design features of the Proposed Action. An indirect effect of herbicide treatment as a precursor to seeding fuel breaks could, 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.

Targeted Grazing - Utilizing grazing animals to create and maintain fuelbreaks 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 (i.e., timing, area, intensity, frequency, and duration), plant species tolerance to grazing, and site pre-treatment condition (Hendrickson and Olson 2006). Sheep and goats prefer broadleaf forbs, and cattle prefer grasses however, all three animal species will eat most vegetation if confined for a long period of time, and/or with high animal numbers (Burritt and Frost 2006).

Annual spring grazing, prior to cheatgrass and medusahead seed production would reduce the density and cover of these species over time (Finnerty and Klingman 1962). However, native Sandberg bluegrass (with similar phenology to cheatgrass) may be reduced as well (Murray 1971). Design features of the Proposed Action would minimize the potential for the establishment and spread of invasive annual and noxious weeds within the fuelbreak. Indirect and long-term effects of properly managed targeted grazing and appropriate levels of fuelbreak 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.

Prescribed Fire - Prescribed fire would be used in areas currently dominated by cheatgrass or medusahead for seedbed preparation from late-fall to early spring (Nov-Feb). Fuel loading in these areas is predominantly composed of fine, flashy fuels and fire intensity and duration would be low and of short duration. Seeds in the upper most layer of the soil surface would be destroyed by prescribed fire (Diamond et al. 2012). However, fire does not consume all seeds in the soil. Therefore, a pre-emergent herbicide treatment would be applied subsequent to burning to inhibit residual invasive annual seed germination (Davies and Sheley 2011). Seeding of desired fuel break species would occur in the fall of the same year. Direct effects of prescribed fire would include the removal of accumulated biomass created by these invasive annual grasses (primarily medusahead) as well as the biomass of any perennial plants on-site.

An indirect effect of this treatment would include 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.

Seedings - Seeding perennial plant species for fuel break construction would change plant community composition within the treatment footprint by replacing annual grasses and forbs with perennial species. Fuel breaks would likely require herbicide treatments after initial establishment to limit the amount of invasive plants in the treatment footprint until perennial species reproduce and begin to compete effectively. Once established, fuel breaks of prostrate kochia would out-compete invasive annual grasses and forbs, filling most of the niches within the treatment footprint. These monotypic stands of fire resilient vegetation would reduce species diversity and composition in the treatment footprint. The use of equipment, such as rangeland drills, to seed the areas would disturb soil and create conditions conducive to weed establishment and spread, particularly in the first year or two, 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 control would reduce this potential.

An indirect effect of seeding the proposed grass and sub-shrub 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). Design features include monitoring and control methods to eliminate plants that escape the treatment footprint. The potential for prostrate kochia to spread into existing sagebrush and/or perennial bunchgrass stands with open and available niches was raised as a concern during scoping. Actual spread would vary in distance and trajectory and

would be relative to the amount of soil disturbance, open space, vegetative competition in adjacent areas, and predominant wind direction (Harrison, 2000).

Gray and Muir (2013) documented prostrate kochia spread up to 710 meters from areas where it was drill seeded. However, many areas included in this study (including sites with spread distances of 710, 484, 481, and 472 meters) had been aerially seeded[2] with prostrate kochia prior to, and/or subsequent to, drill seeding. These aerial seedings were implemented in the 1980s and 1990s prior to aircraft using GPS technology for tracking flight paths for seedings. Although treatment boundaries were defined, it is highly possible that the boundaries were not strictly adhered to when adjacent land was BLM and there was no private or state land adjacent to the seeding area. This resulted in a high likelihood of seeds being introduced outside of the proposed seeding area after being dropped from the aircraft. Also, as noted in Harrison et al. (2000), the planting boundaries of aerial seedings are not well defined due to wind gusts and drift.

Many studies have reported on prostrate kochia spread into both intact and disturbed sites less than the spread Gray and Muir reported (Monoco et al. 2003, Waldron et al. 2001, Clements et al. 1997, McArthur et al. 1990). Waldron et al. (2001) collected spread data from 81 prostrate kochia seedings; they found a maximum spread of 385 meters, a recruitment margin ranging from 0-30 meters with an average recruitment margin of 6 meters. At 28 sites Gray and Muir (2013) reported a maximum spread of 710 meters, a recruitment margin ranging from 0-197 meters, with an average recruitment margin of 30 meters. 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; they described in site notes uncertainty about seeding boundaries for 15 of the 28 study sites, including 3 sites for which the greatest spread distance was measured. Gray (2011) indicated that if shapefiles 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." Waldon et al. (2001) did not report data from sites when the "original seeding boundaries were unknown." Prostrate kochia had been drill seeded in a greenstrip 430 meters west (upwind) of Gray and Muir's transect where they assumed that they found spread of 710 meters. This greenstrip was drill seeded in 1986 and was documented in Debolt (2002) and Tuason (2005). Prostrate kochia was drill seeded in 1986 within 400 meters of the site where Gray and Muir measured spread of 671 meters. Based on these data, Gray and Muir's findings do not accurately represent the distance that prostrate kochia can spread from seeded sites.

3.1.2.4 Alternative 3

A total of 10,000 acres would be developed into fuel breaks, of which approximately 4,290 acres would occur in exotic annual grassland, 3,672 acres would occur in big sage and big sage mix, and 819 acres would occur in bunchgrass. The remaining 1,219 acres would occur in rabbitbrush, salt desert shrub, seedings and other minor cover types. Direct and indirect effects

2 - Data obtained from BLM District ESR files, BLM State office files, with confirmation from Google Earth images.

to the vegetation resource by treatment method would be the same as those described in Alternative 2, but across 690 (6.5%) fewer acres.

3.1.2.5 Alternative 4

A total of 8,036 acres would be developed into fuel breaks, of which approximately 2,687 acres would occur in exotic annual grassland, 3,150 acres would occur in big sage and big sage mix, and 999 acres would occur in bunchgrass. The remaining 1,200 acres would occur in rabbitbrush, salt desert shrub, seedings and other minor cover types. Direct and indirect effects to the vegetation resource by treatment method would be the same as those described in Alternative 2, but 2,654 (24.8%) fewer acres would be affected.

3.1.2.6 Alternative 5

A total of 7,708 acres would be developed into fuel breaks, of which approximately 3,141 acres would occur in exotic annual grassland, 2,903 acres would occur in big sage and big sage mix, and 696 acres would occur in bunchgrass. The remaining 968 acres would occur in rabbitbrush, salt desert shrub, seedings and other minor cover types. Direct and indirect effects to the vegetation resource by treatment method would be the same as those described in Alternative 2 but 2,982 (27.9%) fewer acres would be affected.

3.1.2.7 Alternative 6

A total of 3,163 acres would be developed into fuel breaks, of which approximately 1,483 acres would occur in exotic annual grassland, 990 acres would occur in big sage and big sage mix, and 294 acres would occur in bunchgrass. The remaining 396 acres would occur in rabbitbrush, salt desert shrub, seedings and other minor cover types. Direct and indirect effects to the vegetation resource by treatment method would be the same as those described in Alternative 2 but across 7,527 (70%) fewer acres.

3.1.3 Cumulative Effects

Between the various action alternatives, approximately 3,163 to 10,690 acres within the project area would be developed into fuel breaks. The scope of analysis for cumulative effects on general vegetation is the entire project area (293,891 acres). The timeframe for effects from past actions is 30 years, and 5 years for future actions. The impacts discussed above by alternative, when considered with impacts of other actions (past, present and reasonably foreseeable) are described below

3.1.3.1 Alternative 1 – No Action

Failure to take action would result in increasing acres converted from perennial plant communities to plant communities dominated by exotic annual grasses and forbs. Post-fire rehabilitation treatments would continue to be threatened, and impacted, by recurring wildfires. Increases in local populations are likely to continue, resulting in more rural residential developments in the wildland urban interface. These developments, both individually and community-wide, increase the demand for fire-fighting resources which limits availability of resources that can be sent to protect sage-grouse habitat.

3.1.3.2 Alternative 2 – Proposed Action

Cumulative impacts from wildfires would be reduced from those described in the cumulative impacts of the No Action alternative. Post-fire rehabilitation treatments would be protected from recurring fires, which would result in an increase in perennial plant communities and wildlife

habitat. Residential development is expected to continue, the loss of native plant communities on private land would be offset with the ability to implement vegetation restoration or rehabilitation treatments.

3.1.3.3 Alternatives 3-6 – Action Alternatives

The cumulative effects for the remaining action alternatives would be similar as those described for Alternative 2. With diminishing acres of treatment by alternative, the acres disturbed would diminish, however the amount of acres protected would also diminish.

3.2 Special Status Plants

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

Type 1 - Federally Threatened, Endangered, Proposed and Candidate Species
Type 2 - Range-wide / Globally Imperiled Species - High Endangerment
Type 3 - Range-wide / Globally Imperiled Species - Moderate Endangerment
Type 4 - Species of Concern

Definitions

***Element Occurrence* (*EO*) -** An EO is a specific geographic location where "a species or natural community is, or was, present" (NatureServe 2002:10). Populations of a species located greater than 0.62 miles (one kilometer) apart are identified as a separate EO.

Occupied Habitat – Refers to the location where slickspot peppergrass (*Lepidium* papilliferum) has been documented or identified as an element occurrence (EO), and the surrounding area generally within 0.5 mile radius of that occurrence. The 0.5 mile radius buffering area is important to maintain or improve habitat integrity and pollinator populations and habitat necessary for species conservation. The area identified as occupied habitat may include additional slickspots or non-habitat such as roads, houses, etc. Further refinement of occupied habitat would be accomplished through field surveys considering existing resource conditions as well as specific habitat quality and integrity.

Slickspot Peppergrass Habitat – Areas, that through Stage 1 surveys, have documented slickspot microsites (natric and natric-like soil types) between 2,200 and 5,400 feet elevation in southwest Idaho. This habitat type includes areas with slickspots of unknown occupancy. To maintain ecological continuity, if less than 0.5 mile distance exists between slickspot peppergrass habitat, the entire area is considered slickspot peppergrass habitat. After three (3) years of surveys (Stage 2 and Stage 3) if no slickspot peppergrass plants are found, this habitat will be considered unoccupied. In order to classify slickspot peppergrass habitat as unoccupied the three years of surveys in which no slickspot peppergrass plants were observed must be conducted when spring precipitation (March-May) is at least 60 percent of average spring precipitation. For the Boise area this would be a total of at least 2.4 inches of precipitation from March 1 through the end of May, for the Glenns Ferry area, 1.4 inches.

Potential Habitat – Areas within the known range of slickspot peppergrass with specific soil and elevation characteristics that are identified as having the potential to support slickspot peppergrass, even though the presence of slickspots or the plant is unknown.

These areas must meet the following criteria:

- Natric and natric-like soils forming "slickspots," and associated soil series, or phases thereof, characteristic of Loamy 7- to 10-inch and 10- to 13-inch ecological sites with Wyoming big sagebrush (Major Land Resource Areas 11—Snake River Plains, and 25—Owyhee High Plateau), and have an aridic, bordering on xeric, soil moisture regime and;
- 2,200 to 5,400 feet elevation;
- Surveyed potential habitat not meeting these criteria will not be considered habitat for slickspot peppergrass

As of August 2013 Stage 1 surveys were completed; all Potential Habitat within the project treatment footprint was re-classified as Slickspot Peppergrass Habitat due to survey findings.

Proposed Critical Habitat – Proposed critical habitat is defined in Section 3 of the ESA as:

1. The specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the Act, on which are found those physical or biological features:
   a. Essential to the conservation of the species, and
   b. Which may require special management considerations or protection; and
2. Specific areas outside the geographical area occupied by the species at the time it is listed, upon a determination that such areas are essential for the conservation of the species.

Proposed critical habitat is a subset of occupied habitat and therefore will be analyzed as such in this EA. All of the primary constituent elements (PCEs) of critical habitat for slickspot peppergrass (USDI FWS 2011) are addressed within the context of occupied habitat.

3.2.1 Affected Environment

Within the proposed project area there are five special status plant species; slickspot peppergrass (*Lepidium papilliferum*), wovenspore lichen (*Texosporium sancti-jacobii*), Packard's desertparsley (*Lomatium packardiae*), mourning milkvetch (*Astragalus atratus* var. *inseptus*), and Snake River milkvetch (*Astragalus pushii* var. *ophiogenes*) (Map 9). The EOs that occur within the proposed project boundary, size of each EO, distance to proposed fuel break, and EO rank (as described in Colket et al. 2006) are provided in Table 3.1.

Table 3.1 - Special status plant species within the project area. Acreage reflects actual area covered by the EO and does not include the 0.5 mile buffer that makes up the occupied habitat surrounding the EO.

Species (BLM Ranking)	EO#	Acres	Distance to center of fuel break	EO Rank[1] (year ranked)
Slickspot Peppergrass (Type 1)	8	1,017	In Fuel Break	B (2005)
	15	155	In Fuel Break	D (2005)
	20	3	In Fuel Break	C (2005)
	21[2]	100	0.2 miles (1,070 ft)	C (2004)
	26	683	In Fuel Break	B (2005)
	29	125	In Fuel Break	C (2005)
	30	675	In Fuel Break	B (2005)
	31	71	1.92 miles (10,154 ft)	C (2005)

Species (BLM Ranking)	EO#	Acres	Distance to center of fuel break	EO Rank[1] (year ranked)
	51	4	In Fuel Break	BD (2010)
	54[2]	0.3	0.50 miles (2,654 ft)	F (2005)
	60	15	0.20 miles (1,070 ft)	D (2005)
	61	14.7	0.30 miles (1,565 ft) Outside Project Boundary	C (2005)
	62	6	In Fuel Break	C (2010)
	63	8	2.07 miles (10,909 ft)	D (2006)
	106	< 0.5	In Fuel Break	Not Ranked
	112	< 0.5	0.39 miles (2,064 ft)	D (2010)
	113	< 0.5	0.09 miles (453 ft)	CD (2010)
	115	< 0.75	0.92 miles (4,856 ft)	C (2010)
	116	< 0.5	In Fuel Break	D (2012)
	117	< 0.5	In Fuel Break	CD (2012)
Wovenspore Lichen (Type 2)	11	7.5	In Fuel Break	Extirpated (1998)
	16	15	0.07 miles (350 ft)	Not Ranked
	17	4	0.54 miles(2,864 ft)	C (2000)
Packard's lomatium (Type 2)	10	< 0.5	0.58 miles (3,055 ft)	E (2005)
Mourning Milkvetch (Type 4)	19	1.5	In Fuel Break	CD
	26	102	In Fuel Break	Not Ranked
	62	300	In Fuel Break	E
	64	28	In Fuel Break	Not Ranked
	65	8	In Fuel Break	Not Ranked
	66	8	In Fuel Break	Not Ranked
	69	24	0.41 miles (2,172 ft)	Not Ranked
Snake River milkvetch (Type 4)	20	1 ,000	In Fuel Break	Not Ranked

[1]Ranks are per Idaho Fish and Game ranking system based on size of occurrence, condition of occurrence, and landscape context (Colket et al. 2006). [2]EOs 21 and 54 are likely extirpated (see below).

Slickspot Peppergrass

Slickspot peppergrass, a Type 1 special status plant, is an endemic annual or biennial plant (Meyer et al. 2005) that occurs on sparsely vegetated microsites known as "slickspots" in sagebrush-steppe habitats of southwestern Idaho (Mancuso 2000). This plant's main distribution lies along the Snake River Plain between New Plymouth, Idaho and Glenns Ferry, Idaho, with disjunct populations occurring in the Inside Desert, approximately 40 miles (70 kilometers) south of Glenns Ferry, Idaho.

Distribution of plants and populations is patchy within the range of the species as plants are highly restricted to slickspots (Mancuso 2000). Slickspots are shallow depressions that occur in

sagebrush steppe communities and are characterized by higher clay and salt content, and lower organic matter and nutrient content than surrounding soils (Fisher et al. 1996). Because of their structure these shallow depressions retain surface and subsurface water for a prolonged period compared to surrounding soils (Meyer et al. 2005, Moseley 1994). Over time litter and soil accumulation can fill in the depression of a slickspot potentially changing water infiltration and the salinity of the slickspot, and burying seed. Meyer et al. (2005) found that slickspot peppergrass seeds can remain viable in the seed bank for up to 12 years. However, optimal emergence depth is in the upper 2 cm (0.8 in) of soil within a slickspot; this is also the depth where the most seeds are found (Meyer and Allen 2005).

Slickspot peppergrass relies primarily on insect-mediated pollination for successful reproduction (Robertson and Ulappa 2004). As distance between outcrossing plants decreases, as may occur in smaller more isolated populations, percent fruit set decreases and signs of inbreeding depression increase (Billinge and Robertson 2008). Smaller, populations of slickspot peppergrass within the Snake River Plain have been found to possess significantly less genetic diversity than larger populations (Stillman 2006).

Because slickspot peppergrass primarily outcrosses using a variety of generalist pollinators (Robertson and Ulappa 2004), suitable pollinator habitat is essential to the conservation of the species. In addition to native forbs, pollinators need undisturbed nesting and egg-laying cavities above and below ground (Black et al. 2007). Pollinator abundance and diversity is important in harsh environments, such as the desert, as plants have a narrow time frame in which they can be pollinated. This is especially important for annual plants such as slickspot peppergrass which depends on annual seed set for its long-term survival (Meyer et al. 2006).

Slickspot peppergrass was listed as threatened under the ESA effective December 7, 2009 (Public Law 93-205, 1973, as amended through Public Law 107-136, 2002). August 8 of 2012, the United States District Court for the District of Idaho ordered that the final rule listing slickspot peppergrass as a threatened species under the Act, be vacated and remanded for further consideration consistent with the court's decision. Until further legal guidance is received, the USFWS and BLM consider slickspot peppergrass as Proposed Endangered under ESA.

In 2006, BLM and the USFWS entered in a conservation agreement (CA) that addressed ongoing activities affecting slickspot peppergrass (Conservation Agreement 2013). This CA provided for implementation of a number of conservation measures, including those designed to help offset adverse impacts to the species from such factors as; livestock grazing, herbicide use, invasion of non-native plant species, fire suppression activities, post-fire rehabilitation, and fuel break implementation. The CA also addressed survey protocol for potential and slickspot peppergrass habitat, and methods to conserve both slickspot peppergrass habitat and pollinator habitat.

As of February 2013, there were 92 extant element occurrences of slickspot peppergrass, 33 located in the Inside Desert region south of Bruneau, ID, and 59 located within the northern range of the species, the Snake River Plain and Boise Foothills, which falls within the FRFO. Within the FRFO there are 105,150 acres of occupied habitat. This acreage includes the 0.5 mile

buffer that surrounds each EO to protect pollinator habitat. Across the FRFO 457,396 acres have been identified as slickspot peppergrass habitat.

Within the proposed project area there are 19 extant slickspot peppergrass element occurrences (EOs) as described in Table 3.1. Part or all of 11 of these EOs are located within proposed fuel breaks. Occupied habitat of five EOs, 54, 60, 61, 112 and 113, falls within proposed fuel breaks though the actual EO itself does not. The remaining EOs within the project boundary are varying distances from proposed fuels breaks as denoted in Table 3.1. Element Occurrence 61 is located outside the project area but the 0.5 mile buffer of occupied habitat of this EO falls within the project area. There are 27,850 acres of occupied habitat that fall within the proposed project boundary. Fourteen of the nineteen EOs within the project area have Habitat Integrity and Population (HIP) transects that are conducted yearly. The average population size from these 14 HIP transects from 2005 to 2011 accounted for 16% of the total population across all HIP transects within the FRFO.

Habitat within proposed fuel breaks as a percentage of total habitat within the Four Rivers Field Office (FRFO) is presented in Table 3.2 by habitat type; e.g. the acreage of occupied habitat that would fall directly within proposed fuel breaks for Alternative 2 represents 1.6% of the occupied habitat across the entire FRFO. Population size of EOs directly within proposed fuel breaks as a percentage of total population across the FRFO is presented in Table 3.2 by alternative; e.g. 12% of FRFO slickspot peppergrass population falls within proposed fuel breaks under Alternative 2.

Table 3.2 - Element Occurrence components and habitat type acreages within proposed fuel breaks as a percentage of totals in Four Rivers Field Office

EO Components and Habitat Types		Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
Element Occurrence	Pop. Size	12%	12%	11%	11%	4%
	EOs within fuel breaks	19%	19%	15%	15%	8%
Acres	Occupied	1.6%	1.7%	1.2%	1.2%	0.6%
	Slickspot peppergrass	1.3%	1.2%	0.9%	0.9%	0.4%
	Proposed Critical	2.8%	2.8%	2.4%	2.4%	0.5%

The occupied habitat of EO 21 falls within proposed fuel breaks; however, yearly surveys since July of 2004 have failed to find any slickspot peppergrass plants in or near this EO. Element Occurrence 21 is likely extirpated. Element Occurrences 10, 27, 50 and 104 are also near the project boundary, however the occupied habitat surrounding these EOs does not fall within the project boundary. Because these EOs are between 0.68 and 2 miles from proposed fuel breaks they will not be analyzed in this EA as the proposed project is unlikely to affect them. Element Occurrence 54 is 0.55 miles from a proposed fuel break; however, yearly HIP transect surveys conducted since 2004 and BLM slickspot surveys have failed to find any slickspot peppergrass plants. It is likely that this EO is now extirpated.

There are 89,494 acres of slickspot peppergrass habitat within the proposed project boundary, 5,818 of these acres are within proposed fuel breaks. Within the project boundary there are 8,959 acres of critical habitat.

Approximately 25 percent of known slickspot peppergrass habitat in the project area is dominated by invasive non-native annual grasses and forbs as determined through surveys of potential habitat. Much of the native plant communities that historically inhabited the project area have been altered by the recurrence of wildfires and livestock grazing.

Historically slickspots soils had lower organic matter than surrounding soils (Fisher et al. 1996, Meyer & Quinney 1993). Kinter et al. 2012 noted that organic matter within slickspots is likely increasing as a result of increased litter from invasive non-native annual species within and surrounding slickspots. As organic matter within slickspots increases they become more hospitable to additional invasion by species that would normally not occupy slickspots. In the 2011 HIP transects "some (slickspots) were so heavily invaded that they were barely recognizable as slickspots" (Kinter et al. 2012).

Following large fires on BLM managed land burned areas are typically drill seeded with a mix of introduced perennial grasses and big sagebrush. In the past many slickspots were drill seeded without depth bands resulting in damage to the slickspot soil layers that allowed seeded and unseeded species to invade the slickspot. Many past rangeland seedings in the project area have not been successful, which has resulted in large areas dominated by invasive non-native annual grasses and forbs such as cheatgrass and tumblemustard.

Prostrate kochia has been seeded on 62 acres of occupied habitat and 1,001 acres of slickspot peppergrass habitat within the project area. Prostrate kochia was seeded largely to establish fuel breaks along I-84. Prostrate kochia has been reported to establish well in slickspots within areas that were drill and/or aerially seeded with prostrate kochia (Kinter et al. 2012, Gray 2011, Debolt 2002), potentially displacing slickspot peppergrass (Debolt 2002). However the persistence of prostrate kochia outside of seeded areas is unknown. Habitat Integrity and Population (HIP) monitoring transects since 2004 report prostrate kochia persisting in slickspots and the surrounding area in one transect, 019B, which falls directly in an area that was aerially and drill seeded with prostrate kochia. In other transects, prostrate kochia has been documented within slickspots or in the general area for some years but then in subsequent years was not found (Table 3.3). Gray and Muir (2013) also noted that prostrate kochia "appeared to be self-limiting; early in the season many seedlings had established around reproductive individuals; however, by late summer many of the seedlings had died." Sullivan et al. (2013) found prostrate kochia to persist after being seeded into a non-native invasive annual plant community, but essentially disappeared from a shrub community 6-7 years after being seeded with prostrate kochia and subjected to various disturbances.

Prostrate kochia has been shown to invade slickspots and playas (Kinter et al. 2012, Debolt 2002). However the persistence of prostrate kochia within slickspots is unknown. Habitat Integrity and Population (HIP) monitoring transects since 2004 show prostrate kochia persisting in slickspots and the surrounding area in one transect, 019B, which falls directly in a prostrate

kochia seeding. In other transects, prostrate kochia has been documented within slickspots or in the general area for some years but then in subsequent years was not found (Table 3.3).

Table 3.3 - Presence of prostrate kochia in and near slickspots within HIP transects

HIP #	Miles to nearest kochia seeding	2004	2005		2006		2007		2008		2009		2010		2011	
		% SS[1]	% SS	% near[2]	% SS	% near	% SS	% near	% SS	% near	% SS	% near	% SS	% near	% SS	% near
018a	1.36	0.3			0.05											
018b	1.04				0.30		0.40	0.03								
019a	0.4		3.65	3.23	0.20		0.10									
019b	0		18.0	2.10	34.0	3.10	38.5	3.43	14.1	3.40	15.05	6.53	21.5		25.50	>25
24	2.81				0.05											
32	8.74									0.03						
42	2.8												0.10	1-10	0.10	
52	22.2					0.03										
61	0.36			0.03												
62	2.07			0.03												
63	3.29				0.05											
68	0.21											<1		<1		10-25
70	0.35															

[1] Percent cover within HIP transect slickspots. [2] Percent cover in General Occurrence Area. Colket 2009, Kinter et al. 2010, 2011, 2012.

Prostrate kochia has been documented to spread, though the extent of spread has been debated (see Section 2.3.2.1, Prostrate kochia) . This plant's tolerance of saline conditions has allowed it to easily establish in slickspots within past seedings. These characteristics could render pronounced impacts on slickspot peppergrass and slickspots if not monitored and controlled as per the Design Features (Section 2.3.2.2).

Other Special Status Plant Species

Three Element Occurrences of wovenspore lichen, a Type 2 BLM sensitive species, occur within the project boundary (Table 3.1). Wovenspore lichen is a non-vascular plant that occurs on organic matter and organic soils in old growth sagebrush habitat. Element Occurrence 11 falls directly within a proposed fuel break, however this EO was determined to be extirpated in 1998 (per Idaho Fish and Game Element Occurrence Record). The southwestern portion of EO 16 is 350 feet from a proposed fuel break. This area is currently dominated by cheatgrass following fires in 1996 and 2002. Element Occurrence 17 is 2,864 feet from a proposed fuel break and will not be impacted by the proposed action. Therefore, this species will not be discussed further.

There is one Element Occurrence of Packard's desertparsley, a Type 2 BLM sensitive species, within the project boundary (Table 3.1). However, no Packard's desert parsley was found during special status plant surveys along proposed fuel break routes. Additionally no plants of this species were discovered during slickspot peppergrass surveys in the area surrounding the known EO. There are 17 element occurrences of Packard's desert parsley in Idaho. Therefore, this species will not be discussed further.

Mourning milkvetch is a BLM Type 4 sensitive plant species (Table 3.1) with seven (7) EOs located within the project boundary; portions of six (6) of the EOs are located within proposed fuel breaks of Alternative 2, 3, and 4, portions of 5 EOs are located within Alternative 5 and no EOs are located within Alternative 6. There are 65 extant mourning milkvetch EOs within the state of Idaho. Surveys in recent years within the Boise District have revealed this species to be much more prevalent than previously reported (pers. comm. Mark Steigers, Four Rivers Field Office Botanist). Implementing fuel breaks in these few EOs is unlikely to negatively impact the species within the Boise District or within the state of Idaho. In recent years this species had been found to be much more common than originally thought and is being considered for removal from the BLM special status species list. Therefore, this species will not be discussed further.

Snake River milkvetch is a BLM Type 4 sensitive plant species. There are 63 extant Snake River milkvetch element occurrences within the state of Idaho. The EO of this species found within the project area is known from an herbarium collection taken in the 1980s and from surveys of potential habitat conducted in 2011 in the general area. No Snake River milkvetch was found during the special status plant surveys along proposed fuel break routes. Therefore, this species will not be discussed further.

3.2.2 Environmental Consequences

For all action alternatives the same treatment methods will be analyzed as means of implementing fuel breaks within the project area.

Analysis Methods and Assumptions

For this analysis mileages and acres affected by actions were estimated using BLM Global Positioning System (GPS) data. Surveys of all potential, slickspot peppergrass and occupied habitat were completed during the summer of 2013. While several new occupied slickspot peppergrass locations were identified during the 2013 surveys, the new locations were within 1 km of known EOs and would be incorporated into those existing EOs. No new EOs were identified, and occupied habitat acreage did not change.

The mileage and therefore acreage of impacts could be reduced in areas where other resource constraints such as soils, cultural, and wildlife, limit the use of certain treatment methods.

Table 3.4 - Estimated extent of affected habitat within proposed fuel breaks on public and state land

Habitat Type	Alternative 2		Alternative 3		Alternative 4		Alternative 5		Alternative 6	
	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres
Occupied	50	1,818	51	1,854	35	1,273	35	1,273	17	618
Slickspot Peppergrass	189	6,872	180	6,545	133	4,836	129	4,690	75	3,345
Critical	22	800	22	800	18	655	18	655	4	145
Total*	239	8,690	231	8,399	168	6,109	164	5,963	929	2,509
EO	12	436	12	436	10	364	10	364	3	109

Habitat Type	Alternative 2		Alternative 3		Alternative 4		Alternative 5		Alternative 6	
	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres	Miles	Acres
EOs Within Fuel Breaks	8, 15, 20, 26, 29, 30, 51, 62, 116, 117		8, 15, 20, 26, 29, 30, 51, 62, 106, 116, 117		8, 15, 20, 26, 29, 30, 106, 116, 117		8, 15, 20, 26, 29, 30, 106, 116, 117		15, 20, 29, 116, 117	

*Totals do not include proposed critical habitat data as it is a subset of occupied habitat.

General Effects

The Fish and Wildlife Service (FWS) identified the primary factors threatening slickspot peppergrass, which include changes in wildfire regime (i.e., increased wildfire frequency and size) and invasive non-native plants, especially cheatgrass. Additional factors threatening the species include; land conversion associated with urban and agricultural development (a moderate risk factor); seed predation by harvester ants (an emerging threat); habitat fragmentation and isolation of small populations; and climate change. Livestock use, wildfire management and post-fire rehabilitation, military training, and recreation are not considered to pose a significant threat to the species range-wide, although localized adverse effects to individual plants or habitat may occur related to these factors (USDI FWS 2009).

Herbicide

The potential loss of individual slickspot peppergrass plants as a result of herbicide application would be minor due to wind consideration and large droplet design features, to protect plants in EOs. Herbicides would be selected that do not persist in the soil and therefore would not affect future generations of plants or seeds. Any loss of individual plants would be at most a loss of two-year's growth if the biennial form of the plant were damaged and loss of seeds from any damaged plants.

Benefits of herbicide application include enhancing slickspot peppergrass EOs, occupied habitat, and slickspot peppergrass habitat by decreasing non-native invasive annual biomass and seed sources, and improving pollinator habitat with the removal of non-native annual invasive plants. Risks include a decrease in native forbs which may provide forage for potential pollinators.

Targeted Grazing

Targeted grazing would not be authorized in EOs; therefore, damage to individual plants and/or slickspots would not result. However, targeted grazing within occupied habitat, but outside of EOs, would likely result in the permanent loss of seeds within the seed bank when trampling results in seeds being buried below a depth at which they can emerge following germination (Meyer et al. 2005). Slickspots outside of EOs, but within the occupied habitat buffer may no longer have slickspot peppergrass plants but could very likely retain seeds. Targeted grazing would likely occur in the "early growing season" which coincides with times when soils are often saturated; therefore it is unlikely that it would be authorized in occupied habitat, slickspot peppergrass habitat, or slickspot peppergrass EOs. During drought years, these conditions may not preclude targeted grazing during this time period, and therefore the described impacts could occur.

Targeted grazing as a treatment method for this project is likely to only be used in areas where other treatment methods are not feasible due to terrain, or other resource concerns.

The effects of targeted grazing would be commensurate with the number of livestock confined in a relatively small location. Targeted grazing, when soils are wet or dry, could change the functionality of individual slickspots through trampling. The soil layers in a slickspot are integral to its function; the surface silt layers of a slickspot are generally less than 5 cm deep (Fisher et al. 1996, Kinter et al. 2010), below the silt layer a heavy clay layer limits the movement of water downward through the slickspot. When the restrictive heavy clay layer is compromised through ground disturbing activities, the functionality of the slickspot can also change; this clay layer may no longer be able to retain water late into the growing season thus limiting water to the tap-rooted slickspot peppergrass. Non-native annual species may more easily invade slickspots, and slickspot peppergrass seeds may be buried below a depth at which they can emerge following germination. Rehabilitation of slickspots and reintroduction of slickspot peppergrass to slickspots in this condition is unlikely. Targeted grazing could also result in increased soil deposition into slickspots which could change the functionality of a given slickspot as described above.

Targeted grazing could result in the loss of pollinator forage and habitat through grazing of native forbs and trampling of nesting habitat. Large numbers of individual plants are unlikely to be lost due to direct grazing of the plants as they are particularly unpalatable (Amy Stillman, personal observation). Targeted grazing could lead to the spread and continued persistence of invasive annual plants and noxious weeds through both physical transport and continuous soil disturbance.

Disking

Slickspots that are disked would be permanently lost. Soil deposition within slickspot could bury seeds to a depth at which they are unable to emerge following germination, change the way water infiltrates a given slickspot thus changing the functionality of the slickspot, and provide a more suitable seedbed for non-native invasive annual plants to invade slickspots. Disking would result in the permanent loss of insect pollinator forage and nesting sites. Habitat fragmentation resulting from disking could alter pollinator flight patterns and disrupt pollinator movement thus affecting gene flow and reproduction in slickspot peppergrass.

Element occurrences that are near disked fuel breaks could be exposed to increased soil deposition. This effect is likely to continue to occur as long as biennial disking of fuel breaks continues.

Mowing and Mechanical Thinning

Removing shrub overstory through mowing could result in increased harvester ant populations (White 2009), increased damage from livestock grazing by easing accessibility, and the loss of pollinator nesting and egg-laying sights. Mowing could fragment habitat between slickspot peppergrass EOs thus changing pollinator flight patterns and disrupting pollinator movement between EOs. Mowing and mechanical thinning of sagebrush could improve pollinator forage by opening the understory and allowing the release of native seeds in the seed bank. Mowing could take place outside of, but immediately adjacent, to occupied habitat in order to protect this habitat from wildfires.

Prescribed Burning

Prescribed burning could result in loss of native forbs (pollinator forage), and could increase habitat fragmentation thus interrupting pollinator flight patterns and movement between EOs, and decrease available pollinator nesting and egg-laying sights. Because slickspots are becoming increasingly invaded by non-native invasive species (Kinter et al. 2012), heat from prescribed burning through slickspots containing invasive non-native plants such as cheatgrass has the potential to damage the seed bank. Prescribed fire would likely take place when soils are frozen or moist; therefore damage to the seed bank would be less likely. The effects of fire on slickspot peppergrass seed bank has not been researched and is unknown at this time. However, slickspot peppergrass seed is known to have a mucilaginous seed coat, this seed coat may not only offer protection to the seed but also can aid in repairing the seed if damaged (Huang et al. 2008).

Seeding

Slickspots are not likely to be lost from seeding but could be altered by exposing slickspot soil to erosion for a short period until the seeding becomes established. Seeding through slickspots could damage individual slickspot peppergrass plants and result in relocation of the seeds within the soil horizons of a slickspot. Seeding in areas surrounding occupied or slickspot peppergrass habitat could result in soil deposition into slickspots.

Using depth bands on range-land drill or minimum till drills during seeding in occupied and slickspot peppergrass habitat would, in most cases, protect slickspots from destruction of the restrictive layer. Breaking through the restrictive layer during seeding would be possible; though the likelihood of this occurring is negligible. There was no perceptible breaking through of the restrictive layer during post-fire seeding using depth bands or no-till drills in the 2012 Benwalk Fire.

Seeding native perennial species, especially native forbs would improve pollinator habitat and minimize the effects of habitat fragmentation on pollinator behavior by providing connectivity between EOs and slickspots within EOs.

Prostrate kochia

Slickspot peppergrass plants and habitat, as well as pollinator habitat could be lost to competition from prostrate kochia. Prostrate kochia has been reported to establish well in slickspots within areas that were drill and/or aerially seeded with prostrate kochia (Kinter et al. 2012, Gray 2011, Debolt 2002), potentially displacing slickspot peppergrass and Davis' peppergrass (Debolt 2002) which occurs outside of the project area but in the cumulative impacts analysis area. Prostrate kochia is a highly competitive introduced sub-shrub that is capable of growing in saline soils, and has been documented to invade slickspots and playas (Kinter et al. 2012). Prostrate kochia has a fibrous root system, a deep taproot, and is known to be highly competitive with cheatgrass (Monaco et al. 2003). These characteristics would likely also render it highly competitive to native grasses and forbs.

Because of its ability to colonize slickspots, prostrate kochia would most likely compete with slickspot peppergrass plants and seeds for water and nutrients within slickspots. While no prostrate kochia would be planted within occupied habitat it may be considered in slickspot peppergrass habitat in high ignition areas, such as along Interstate 84. If prostrate kochia is planted in slickspot peppergrass habitat then the monitoring protocol in the Design Features

(Section 2.3.2.2) will be implemented. If prostrate kochia is found to be spreading into untreated areas then plants will be removed either by hand or through spot herbicide treatment.

3.2.2.1 Alternative 1 – No Action

If no action is taken, slickspot peppergrass and its habitat would not be directly impacted by establishing fuelbreaks and the associated effects as discussed in the following sections.

However, fires that ignite along roads and power lines (human starts) would occur in a continuous fuel load from which they would be able to spread into slickspot peppergrass and other special status species habitat. Existing fuel breaks would not be maintained, would continue to degrade, and would provide no deterrent to wildfire spread. Occupied, and co-occurring critical habitat, would have no protection from future rapid spreading, uncharacteristically large, hot wildfires.

In 2003, wildfire and invasion by non-native annual plants and noxious weeds were identified as the two primary reasons for slickspot peppergrass decline and loss of habitat (USDI FWS 2003). Wildfires have occurred in slickspot peppergrass EOs and various habitats across the range of the species. Within the project area, the 2011 Morrow fire burned 300 acres of EO 26 and in 2012 all of EOs 51 (~200 acres),, 62 (~278 acres) and 113 (0.25 acre) burned in the Benwalk fire. During the 2012 fire season, approximately 60,065 acres were burned by seven fires in and adjacent to the project area; all or part of slickspot peppergrass EOs 8, 31, 51, 62, 113, and 117 burned. Since 1957 all or part of nearly every slickspot peppergrass EO in the project area has burned in a wildfire. If no action is taken 27,850 acres of occupied slickspot peppergrass habitat, 2,880 acres of which are in extant slickspot peppergrass EOs, would not be protected from future wildfires. There are 89,494 acres of slickspot peppergrass habitat within the proposed project boundary, if no action is taken this habitat would have no protection from future wildfires.

As wildfires continue to burn through slickspot peppergrass EOs and habitats invasion by non-native annual plants such as cheatgrass will continue to spread and invade slickspots leading to increased organic matter within slickspots and increasing competition for water and nutrients between slickspot peppergrass plants and these invasives.

3.2.2.2 Alternative 2 –Proposed Action

Approximately 50 miles of fuel breaks would occur in occupied habitat, 22 of which are designated as proposed critical habitat for slickspot peppergrass (Table 3.4). If fuel breaks are fully implemented at 300 feet wide, there would be a maximum of 1,818 acres of occupied habitat (6.5% of the occupied habitat within the project boundary) surrounding 10 EOs that could be impacted by the various fuel break treatment methods. Roughly 12 miles of fuel breaks fall directly within known EOs; this would mean a maximum of 436 acres of element occurrences could be impacted by fuel breaks.

There are 189 miles of proposed fuel breaks that would fall within slickspot peppergrass habitat. A maximum of 6,872 acres of slickspot peppergrass habitat (7.7% of the slickspot peppergrass habitat within the project boundary) could be impacted by fuel break treatment methods.

Herbicide
Herbicide treatment impacts could occur on up to 1,818 acres of occupied habitat and 6,872 acres of slickspot peppergrass habitat. Loss of plants would be negligible and loss of seeds in the seed bank unlikely due to herbicide-specific design features.

Targeted Grazing
Targeted grazing could impact up to 1,309 acres of occupied habitat; this does not include acreage inside EOs themselves as targeted grazing is not allowed within the EOs. Up to 6,872 acres of slickspot peppergrass habitat could be impacted by targeted grazing.

Disking
Disking would not directly affect occupied habitat or EOs. A disked fuel break would be no more than 50 feet wide therefore disking could occur on up to 1,145 acres of unoccupied slickspot peppergrass habitat. There are four slickspot peppergrass EOs (60, 61, 112, and 113), that fall within 0.5 miles of a proposed fuel break that could be exposed to increased soil deposition due to disking in nearby fuel breaks. This effect would occur as long as biennial disking of fuel breaks continues.

Mechanical Thinning
Mechanical thinning could occur on up to 1,818 acres of occupied habitat; this does not include acreage inside EOs themselves as thinning is not allowed within the EOs. Up to 6,872 acres of slickspot peppergrass habitat could be mechanically thinned.

Mowing
Mowing could occur on up to 6,872 acres of slickspot peppergrass habitat. Mowing may also take place in occupied habitat on a site by site basis in coordination with the FWS in order to protect this habitat from wildfires.

Prescribed Burning
Prescribed burning impacts could occur on up to 1,818 acres of occupied habitat and 6,872 acres of slickspot peppergrass habitat.

Seeding
Seeding could occur on up to 1,818 acres of occupied habitat and 6,872 acres of slickspot peppergrass habitat. Prostrate kochia would not be planted in occupied habitat but may be considered in some high ignition areas on up to 6,872 acres of slickspot peppergrass habitat.

3.2.2.3 Alternative 3

One additional mile of occupied habitat but the same mileage of critical could be impacted by fuel breaks in Alternative 3 as in Alternative 2. One additional EO that consists of a one acre grouping of slickspots would be impacted as compared to Alternative 2.

Nine fewer miles of fuel breaks would impact slickspot peppergrass habitat; this translates to 327 (4.7%) fewer acres impacted as compared to Alternative 2, a 0.1% decrease of habitat impacted across the FRFO.

3.2.2.4 Alternative 4

Fuel breaks would impact 15 fewer miles or 545 (30%) fewer acres of occupied habitat (Table 3.4). Nine EOs would be impacted by this alternative; this is one less than under Alternative 2.

Under this alternative, 56 fewer miles or 2,036 (29%) fewer acres of slickspot peppergrass habitat would be impacted as compared to Alternative 2.

3.2.2.5 Alternative 5

Alternative 5 is very similar to Alternative 4 in the acres of occupied habitat and EOs affected, see Table 3.4. Fuel breaks could impact 15 fewer miles or 545 (30%) fewer acres of occupied habitat (Table 3.5).

Nine EOs would be impacted by this alternative; this is one less than under Alternative 2. Under this alternative, 60 fewer miles or 2,181 (31%) fewer acres of slickspot peppergrass habitat would be impacted as compared to Alternative 2.

3.2.2.6 Alternative 6

Under Alternative 6 the least amount of occupied and slickspot peppergrass habitat and EOs affected would be impacted by various fuel break treatment methods (Table 3.4.) However, this alternative would also leave the most occupied and slickspot peppergrass habitat, and EOs vulnerable to the effects of rapidly spreading, high intensity wildfires.

Fuel breaks could directly affect 33 fewer miles or 1,200 (67%) fewer acres of occupied habitat (Table 3.3). Five EOs would be directly impacted by this alternative; this is five fewer than under Alternative 2. Under this alternative 114 fewer miles or 4,145 (60%) fewer acres of slickspot peppergrass habitat would be directly impacted as compared to Alternative 2.

3.2.3 Cumulative Effects

3.2.3.1 Scope of Analysis

The geographic scope of cumulative impacts analysis area (CIAA) will be the project area plus a 10-mile buffer to the southwest of the project area (Map 10). This area was chosen because it would encompass any slickspot peppergrass or other SSP EOs that could be directly and/or indirectly affected by fuel breaks as well as those EOs that would potentially benefit from the proposed fuel breaks by slowing fire spread and intensity, thus limiting wildfire size and duration. The CIAA also encompasses habitat and EOs of Davis' peppergrass (*Lepidium davisii*), a Type 3 special status plant that relies on specific habitat similar to slickspot peppergrass.

3.2.3.2 Current Condition

Slickspot Peppergrass

There are 12 additional slickspot peppergrass EOs with rankings of F or higher (Colket et al. 2006) that fall within the CIAA. This translates to 7,484 slickspot peppergrass EO acres in addition to those found within the project area (Table 3.5). Five EOs (1, 14, 34, 44, and 45)

within the CIAA are either ranked as historic or extirpated populations; these will not be considered in the analysis.

Table 3.5 - Slickspot peppergrass EOs that fall within the CIAA

Species (BLM Ranking)	EO#	Acres	Distance to center of fuel break	EO Rank[1] (year ranked)
Slickspot Peppergrass (Type 1)	2	2.5	3.19 miles	C (2005)
	10	4	1.12 miles	D (2005)
	27	7,159	1.97 miles	B (2005)
	28	0.5	2.34 miles	D (2005)
	50	4.2	1.44 miles	C (2005)
	53	40.4	8.80 miles	C (2005)
	67	9.6	4.8 miles	B (2005)
	72	67.3	1.84 miles	C (2005)
	77	4.2	3.37 miles	C (2005)
	103	0.5	3.46 miles	D (2010)
	104	91	0.86 miles	C (2006)
	111	< 0.5	7.33 miles	D (2009)

[1]Ranks are per Idaho Fish and Game ranking system based on size of occurrence, condition of occurrence, and landscape context (Colket et al. 2006).

Other Special Status Species

Ten EOs of wovenspore lichen and fifteen Davis' peppergrass EOs fall within the CIAA (Map 10). Davis' peppergrass is a BLM Type 3 special status species and wovenspore lichen is a Type 2. The closest Davis' peppergrass EO is found 4.5 miles west of proposed fuel breaks. Additional impacts to both species from fuel break implementation may be increased soil deposition into the habitats in which they grow. However, increased soil deposition is expected to be negligible due to the distance between the EOs and the project, and because prevailing winds in the area are generally from the west.

One EO of white eatonella (*Eatonella nivea*) and one of white-margined wax plant (*Glyptopleura marginata*), both Type 4 special status plants,, are found outside of the project area but within the CIAA (Map 10). Fuel break implementation is unlikely to impact these species.

The temporal scope of this analysis includes past activities that have created the present conditions and future activities planned within the next 5 years including the expected duration of effects from current and future activities (roughly 10 years).

3.2.3.3 Cumulative Impacts Analysis

Actions that have had or could in the future impact slickspot peppergrass within the CIAA include on-going livestock grazing and livestock trailing, wildfire, past post-fire rehabilitation drill seeding without depth bands, urban and agricultural development, and energy infrastructure. Climate change could also have an impact on slickspot peppergrass and other SSPs within the project CIAA; the impacts are unknown at this time but some general trends are discussed below. The current condition of slickspot peppergrass and its habitats within the project area is described in the Section 3.2.1.

General

Current safeguards strive to protect slickspot peppergrass EOs, occupied, critical, and slickspot peppergrass habitat against the negative effects of actions within the CIAA, however some impacts could still occur. Livestock grazing and trailing, wildfires, post-fire rehabilitation have led to increased non-native invasive annual species in EOs and habitat.

As invasive annual plants increase a cycle of increased wildfire ignitions, fire intensity, and rapid fire spread follows. Under these conditions native habitats are unable to recover. Litter from invasive annual plants can also accumulate within slickspots thus increasing the organic matter and allowing plants to become established that would not normally be able to establish in the slickspot environment.

Ground disturbance has occurred as a result of livestock grazing and trailing, and firefighting and post-fire rehabilitation equipment in slickspot peppergrass EOs, occupied, and slickspot peppergrass habitat. This disturbance is generally localized and can lead to damage of some slickspots, plants, and the seed bank. The most severe damage occurs when slickspot soils are wet.

Habitat fragmentation and conversion to non-native annual plants from past activities can also degrade pollinator habitat and change pollinator behavior.

Mayfield

Currently, one large scale development, Mayfield Townsite, is planned on private land near the northeast corner of the project area (~4 miles north of slickspot peppergrass EO 31). Approximately 200 acres of potential habitat falls within the proposed Mayfield town site project boundary. Currently there is no known project implementation date; therefore this project will not be analyzed in conjunction with the proposed fuel break project.

Climate Change

According to climate change models the temperature within the Snake River Plain (SRP) has been increasing and is expected to continue to increase at least through the middle of the 21st century (Klos et al. 2012). Precipitation patterns within the SRP have been shifting to increased winter rain and less snow, increased intensity for spring rain events, and decreased summer precipitation than was received historically (Nayak et al. 2010, Klos et al. 2012). Models predict that by mid-century the largest portion of the precipitation within the SRP will come in December and January (Klos et al. 2013). Using data collected from numerous field studies, Meyer et al. (2006) found that slickspot peppergrass biennial persistence is reliant on high summer and low early-winter rainfall. Meyer et al. (2006) found that while a constant percentage of the seed bank germinates each year, the proportion that survives is reliant on high levels of precipitation in February and March. Higher April and May precipitation is positively correlated with the number of plants that make it to flowering and fruiting stage (Meyer et al. 2006). Precipitation trends shifting as a result of climate change could negatively affect slickspot peppergrass by decreasing the number of 1st year biennials that survive over the winter and into the following summer in order to flower and fruit. Annual forms of slickspot peppergrass could also be negatively impacted if growing season precipitation (February through

May) decreases. Increased temperatures and carbon levels could also mean an increase in cheatgrass throughout the SRP as described in USFWS (2009).

Gateway West

The preferred route for Segment 8 of the Gateway West transmission line project (GWW) is located within the proposed fuel break project boundary (Map 11)(USDI 2013). If implemented, construction of Segment 8 is not proposed to start until 2018. However, the cumulative impacts of the Gateway West and the Paradigm Fuel Breaks Project will be analyzed here as the effects of both projects could be long-term; up to 20 years for the Paradigm project and 50 years for GWW. Segment 8 will be a single-circuit 500-kV transmission line with a right-of-way (ROW) of 250 feet, therefore for this analysis that ROW width will be evaluated.

Table 3.6 - Acres of habitat and EOs within Gateway West and Paradigm implementation areas

Habitat	Gateway West Preferred	Paradigm Alternative 2	Paradigm Alternative 3	Paradigm Alternative 4	Paradigm Alternative 5	Paradigm Alternative 6
Occupied	156	1,818	1,818	1,273	1,273	618
Slickspot peppergrass	722	6,872	6,545	4,836	4,690	3,345
Potential	594	0	0	0	0	0
Critical	45	800	800	655	655	145
EOs	0.50	436	436	364	364	109

Within the CIAA the proposed transmission line would cross through occupied habitat of EOs 15, 31 and 72 but not through the EOs themselves. The transmission line would cross through roughly 0.5 acres of one portion of EO 104 as well as the occupied habitat surrounding this EO. Approximately 722 acres of slickspot peppergrass habitat would be impacted by GWW within the CIAA. The potential habitat for the GWW project, most of which occurs on private land, has yet to be surveyed. Following surveys, acreages of occupied and slickspot peppergrass habitat types could increase depending on survey results. Surveys will occur across all ownerships in which the project occurs. For additional information regarding the GWW project and impacts to slickspot peppergrass refer to the GWW BA and EIS (USDI 2013). The acres impacted by both Paradigm and GWW are listed in **Error! Reference source not found.** above.

Design features for GWW include:

- Slickspots would be identified by environmental monitors (surveyors)
- Populations and slickspots within 50ft of construction would be marked to aid in avoidance
- Construction would not occur within 50 of any plants or slickspots
- Seeding during reclamation in areas of habitat would use no-till drills or rangeland drills with depth bands.
- Excess soils will not be stored in or spread on slickspots

3.2.3.4 Cumulative Impacts - Alternative 1 (No Action)

Under the No Action Alternative past, future and on-going actions have led to the current condition and will continue to impact slickspot peppergrass as described above. The only

known project destined for implementation within the fuel breaks project area within the next 5 years outside of current on-going actions is GWW. Therefore the cumulative effects of the current project in conjunction with GWW will be analyzed here.

The impacts of GWW on slickspot peppergrass are described in the EIS (USDI 2013) but are summarized here in context of the CIAA.

Impacts to slickspot peppergrass include but are not limited to:

- loss of plants and seeds
- spread of invasive weeds
- loss of slickspots
- change in fire regime
- degradation of surrounding habitat
- habitat fragmentation
- soil compaction where slickspots are not avoidable
- loss of native shrub cover
- loss of biological crusts

3.2.3.5 Alternative 2 (Proposed Action)

The proposed GWW ROW would intersect proposed fuel breaks in 16 locations. None of these intersections would occur within a slickspot peppergrass EO or occupied habitat; 11 would occur within slickspot peppergrass habitat and the remaining 5 would occur in potential habitat. A total of 90 acres of slickspot peppergrass habitat could occur in the intersections of the fuel break project and the GWW project following final surveys of potential habitat. The additive impact of fuel breaks on slickspots within these intersections is likely to result in loss or burying of potential seeds, possible loss of functionality of the slickspots, or total loss of slickspots. Although slickspots within this habitat were not occupied at the time of the surveys, it is possible that seeds within the seed bank could germinate and emerge in the future.

Invasive annual species would likely decrease following fuel break implementation but could again increase with the implementation of GWW. Pollinator habitat would likely be degraded and possibly lost within the 90 acres of intersection areas that fall within slickspot peppergrass habitat. Within the broader CIAA, fuel break implementation could increase soil deposition into slickspots, although this impact is likely to be short-term until seedings are established. If implemented, GWW would add to this soil deposition and be most pronounced in EOs 15, 20, 30, 31, 51, 54, and 104; EOs that fall within 1 mile of both project routes.

3.2.3.6 Alternative 3

Under Alternative 3 the same intersections of the fuel breaks project and GWW would occur, however because of the change in routes of Alternative 3 an additional 27 acres of slickspot peppergrass habitat would be impacted by both projects. The additive impacts from the fuel breaks project in conjunction with GWW would be minimal compared to Alternative 2. The additional 27 acres occurs in an area of an existing transmission line and the 2010 South Trail Fire. While the legal section is classified as slickspot peppergrass habitat, the specific location was surveyed and no slickspots were found in this area. Indirect impacts from added soil deposition would be as described under Section 3.2.3.4.

3.2.3.7 Alternative 4

The proposed GWW ROW would intersect proposed fuel breaks in 11 locations. None of these intersections would occur within a slickspot peppergrass EO or occupied habitat; 10 would occur within slickspot peppergrass habitat and the remaining 1 would occur in potential habitat. A total of 65 acres of slickspot peppergrass could occur in the intersections of the fuel break project and the GWW project following final surveys of potential habitat. This is 25 fewer acres than under Alternative 2. Indirect impacts from added soil deposition would be as described under Section 3.2.3.4.

3.2.3.8 Alternative 5

The proposed GWW ROW would intersect proposed fuel breaks in 10 locations. None of these intersections would occur within a slickspot peppergrass EO or occupied habitat; eight would occur within slickspot peppergrass habitat and the remaining two would occur in potential habitat. A total of 86 acres of slickspot peppergrass could occur in the intersections of the fuel break project and the GWW project following final surveys of potential habitat. This is four fewer acres than would be intersected by both projects under Alternative 2. Indirect impacts from added soil deposition would be as described under Section 3.2.3.4.

3.2.3.9 Alternative 6

The proposed GWW ROW would intersect proposed fuel breaks in 3 locations. None of these intersections would occur within a slickspot peppergrass EO or occupied habitat; one would occur within slickspot peppergrass habitat and the remaining two would occur in potential habitat. A total of 17 acres of slickspot peppergrass would occur in the intersections of the fuel break project and the GWW project; this is 73 fewer acres than would be intersected by both projects under Alternative 2. Indirect impacts from added soil deposition would be as described under Section 3.2.3.4.

3.3 Wildlife including Fish and Special Status Animal Species

3.3.1 Affected Environment

The project is situated within the Mountain Home Uplands Level IV Ecoregion (McGrath et al. 2002). This Ecoregion is arid rangeland that historically consisted mostly of Wyoming big sagebrush, bluebunch wheatgrass and Thurber's needlegrass. Today, native grasses are much rarer and remaining sagebrush stands commonly have an understory consisting of cheatgrass, medusahead or bur buttercup.

Habitat for the area's wildlife has been degraded by the loss of native vegetation (Section 3.1) and developed infrastructure including roads, power lines, and large power generating wind turbines. Several species exist within the project area, including special status species. However, the altered ecosystem has resulted in reduced numbers of wildlife in and around the project area, especially sagebrush obligate species. The wildlife analysis for this EA does not include all species occurring in the project area. With the exception of mule deer, all species being analyzed are identified as special status species (SSS) and have been documented or are expected to occur within the project area. Species were selected based on their special status and their utility in representing potential effects to similar species. Effects to similar species may

still be identified but not in the same detail as the focal species selected for analysis. The species selected for analysis include:

- Greater Sage-grouse
- Raptors: Golden Eagle, Ferruginous Hawk
- Mule Deer
- Piute Ground Squirrel
- Brewer's Sparrow
- Longnose Snake
- Western Toad

Greater Sage-grouse – On March 23, 2010, the USFWS determined sage-grouse warrant protection under the Endangered Species Act, but was precluded from listing due to other species of higher priority. In the Great Basin, habitat loss as a result of wildfire is the leading cause of sage-grouse declines. Sage-grouse in the vicinity of the project area are part of the Northern Great Basin (NGB) population, which is within the Snake River Plain Sage-grouse Management Zone (SMZ). The NGB population is considered large and the area of this population includes portions of northern Nevada, southeast Oregon, southwest Idaho, and northwest Utah (Garton et al. 2011).

There are approximately 2,111 acres of preliminary priority habitat (PPH) and approximately 24,667 acres of preliminary general habitat (PGH) within the project area (Makela and Major 2012). Preliminary priority habitat is defined as "the habitat of highest conservation value relative to maintaining sustainable sage-grouse populations range-wide". Preliminary general habitat is defined as areas of occupied sage-grouse habitat not contained in PPH. Wildfire, infrastructure development (powerlines, wind turbines), agricultural development (farming), livestock grazing, housing developments, and a plethora of roads have impacted sage-grouse habitat in and around the project area. Sage-grouse numbers have been decreasing in this area for several years and the effects of the habitat altering activities or events previously mentioned will likely increase over time and impede or preclude sage-grouse from ever re-establishing a strong population in the project area.

There are five leks within the project boundary, two leks within 0.5 miles of the project boundary and another 17 leks within ten miles of the project perimeter (Map 12). Only one of the five leks within the project boundary is identified as active and occupied and one of the two leks adjacent to the project area is identified as inactive but occupied. A sage-grouse lek is not considered unoccupied until after five years of being inactive. Of the leks counted in 2013 that are within ten miles of the project area, including those within the project area, only three had birds present (**Error! Reference source not found.**). Of those three active leks, two were urned over by the 2013 Pony Complex Fire. The Pony Complex burned approximately 135,231 acres north of the project area. The fire burned over two active leks (E057 and E060), three leks with unknown status (E058, E059, and E062) and within approximately 0.75 and 0.38 miles of leks E071 and E061 respectively.

Table 3.7 - Results of sage-grouse counts for leks inside the project boundary and within ten miles of the project area.

Lek ID #	High Count Year/# of Birds[1]	Low Count Year or first year with 0 birds /#of Birds	Most Recent Count/# of Birds
E001	1980/2	2002/0	2012/0
E011	1972/4	2002/0	2010/0
E012	1953/6	1972/0	2002/0
E013	1954/3	1972/0	2011/0
E014	1972/12	1985/0	2012/0
E016	2002/1	2010/0	2010/0
E017	1971/2	1985/0	2012/0
E018	1953/11	1985/0	2012/0
E021[2]	1972/10	2006/1	2011/0
E022	1951/11	1972/0	2011/0
E050[3]	1969/33	1976/0	2013/0
E051[3]	1953/33	1966/0	2012/0
E052	1979/4	1985/0	2013/0
E053	1979/5	1985/0	2013/6
E055	2002/11	2012/0	2013/0
E056	2002/3	2012/0	2013/0
E057	2006/23	2012/6	2013/5
E058	1979/22	2012/0	2012/0
E059	1987/16	2012/0	2012/0
E060	1979/9	2010/3	2010/3
E061	1979/11	2012/7	2013/7
E071	2011/6	2012/2	2013/0

[1] Birds counted only includes males.
[2] This lek had zero birds from 1985 until 2006, and zero birds after 2006. The lek was counted six times from 1985 to 2006.
[3] These leks had several different years when no birds were counted before 2012. Counts varied from 17 in 1989 to zero in 1990, which could be due to birds using an alternate lek site.

State and federal agencies have readily acknowledged that the greatest threat to sage-grouse in southwestern Idaho and the NGB is loss of habitat from fire (Idaho Sage-grouse Advisory Committee 2006; USFWS 2010a). There is very little suitable sage-grouse habitat remaining in the project area and where sagebrush is present, it often has invasive annual grasses in the understory. Many areas that have burned are infested with cheatgrass or medusahead.

Raptors:

Golden Eagle – 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 golden eagle is relatively common in the western United States and can be found in a variety of habitats, but prefers open ground or low hills where visibility is good for hunting (Ehrlich et al. 1988; National Geographic Society 2006). It nests on cliffs, large or small trees, and

sometimes constructed infrastructure (i.e. power poles). The golden eagle feeds primarily on mammals, preferring rabbits and ground squirrels, but also will feed on snakes, birds, and large insects when mammals are unavailable (Collopy 1983; Ehrlich et al. 1988). Preferred nesting habitat for the golden eagle is rugged mountains and canyons with little human disturbance. However, successful nesting has been documented in areas with high levels of human disturbance (Michael McGee, personal observation), such as in the Murphy Travel Management Area. Golden eagles use cliff faces, ledges, and also human infrastructure such as power poles for perching and nest sites. Nest territories usually have alternate nests. Cliff and ledge habitat is fairly limited within the project area.

Monitoring of golden eagle nests in the Morley Nelson Snake River Birds of Prey National Conservation Area (SRBP) areas has occurred since at least 1970 (Map 12). There are two known nesting territories within the SRBP portion of the project area. These territories are approximately 1.25 miles apart. The Commeford territory has several documented nest sites with the last successful breeding documented in 2000. The Simpkin territory has three nest sites but the last documented use of this territory was in the late 70's. There have been nine other documented nesting territories in or adjacent to the project area in the Four Rivers management area. Six of those nine nests were constructed on power poles. Nest monitoring at those sites has not occurred and their status is unknown.

Golden eagles have large home ranges that are defended, particularly during breeding season. Home range size may increase or decrease during the non-breeding season. Researchers who examined breeding-season territories reported that average sizes ranged from 20 to 54 km^2 (7.7 to 21 $mi^{2)}$, whereas average sizes of year-round territories ranged from 20 to 92 km^2 (7.7 to 35.5 mi^2) (Kochert et al. 2002). Collopy and Edwards (1989) found that territory size in the SRBP was inversely related to the amount of good jackrabbit habitat present. Foraging habitat selection by resident eagles in the SRBP differed between the breeding season and non-breeding season (Marzluff et al. 1997). Primary prey during the non-breeding season were black-tailed jackrabbits, and eagles selected jackrabbit habitats (sagebrush and rabbit-brush) for hunting during this time and used other habitats (water, agriculture, grassland, winter fat, and salt-desert shrub) less than expected. Primary prey during the breeding season was more variable, and eagles used jackrabbit habitats in proportion to availability (DeLong 2004). In the SRBP, fires created conditions whereby native shrubsteppe was converted to invasive cheatgrass in some eagle territories (Kochert et al. 1999). Eagles in those territories may have been able to compensate for the reduced amount of shrubsteppe after the fires by foraging in more grassland habitats and taking alternate prey such as Rock Doves, waterfowl, yellow-bellied marmots, and mountain cottontails (Kochert et al. 1999). Golden eagles will in some cases travel far from their nests to find good foraging habitats or take alternate prey if habitats closer to their nests are of poorer quality (Marzluff et al. 1997).

Due to habitat loss from fire and invasion of non-native annual grasses in the project area and the SRBP, jackrabbits, the preferred prey of golden eagles in the SRBP (Kochert et al. 1999), have declined across the area. The number of Golden Eagle pairs occupying nesting territories in the SRBP declined significantly from 1971 to 1994 (Steenhof et al. 1997). The recent loss of thousands of acres of sagebrush in the project area has likely continued to impact golden eagles in and adjacent to the project area. While golden eagles forage on a greater diversity of prey

items during the breeding season, habitat loss from wildfire and conversion to cheatgrass and medusahead has impacted those other prey items as well. Additionally, several wind turbines have been erected during the last few years in the project area. Studies at the Altamont Pass Wind Resource Area in California, documented golden eagles as one of the most common raptors killed by wind turbines (Hunt 2002).

Ferruginous Hawk – Ferruginous hawk is discussed in this EA due to the high number of nest sites occurring across the project area and the species' special status.

This hawk species prefers flat or rolling landscapes in sagebrush shrublands and other arid environments. This species feeds mainly on jackrabbits and ground squirrels, but will also take other prey, such as songbirds, grouse, ducks, snakes, lizards, and large insects. It nests on rimrock, cliff ledges, rock outcrops, shrubs, haystacks, junipers, anthropogenic structures (i.e. man-made nest platforms, power poles), or occasionally, on the ground. In addition to the 12 constructed nest platforms in the project area, there have also been approximately 65 other nest sites documented since 1970, many of which are likely alternate nests within a nesting territory (Map 12). Most ferruginous hawk nests in the project area have been established on power poles.

Ferruginous hawks are easily disturbed during the breeding season (Keeley and Bechard 2011; White and Thurow 1985). Dechant et al. (1999) advises to avoid treatments between 1 March and 1 August each year, especially during incubation, an average of 32 days between mid-March to mid-April, when these hawks are more prone to abandon nests, if disturbed.

Collins and Reynolds (2005) stated the primary threats to this species included among other things, lack of suitable prey species and lack of suitable habitat surrounding nest sites. Most primary threats originate from habitat alteration that leads to a significant reduction in small mammal populations, the primary food source of ferruginous hawks. They also state that while all threats operate on a local scale, it should be understood, habitat loss and degradation occur on a broad scale, and retaining large, intact tracts of grassland and shrub-steppe present the major challenge to preserving viable populations of ferruginous hawks.

The species is considered Sensitive by BLM and a Species of Greatest Conservation Concern (SGCN) by IDFG. Over forty percent of their southern Idaho habitat has been altered, and their numbers have dwindled (IDFG 2008). The species can benefit from maintaining sagebrush habitat and prey populations. A more recent concern is the development of wind farms, such as those in the project area on private lands, where hawks could potentially collide with wind turbine blades or abandon nest sites due to increased human activity (IDFG 2008).

In addition to golden eagle and ferruginous hawk, several other raptors utilize habitat throughout the project area. Some commonly observed species include prairie falcon, red-tailed hawk, Swainson's hawk, northern harrier, and American kestrel. All are protected and managed under the Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. 703 et. seq.), and Executive Order 13186.

Mule Deer – Mule deer is the only species analyzed in this EA not managed as a special status species, which is due to their widespread distribution and healthy populations in most areas of Idaho. The project area west of Mtn. Home has been classified as big game winter range and a small portion to the east as well. Much of the project and surrounding area consisted of sagebrush which provided important winter forage and thermal cover. However, the amount of suitable winter habitat for mule deer as well as Rocky Mountain elk and pronghorn antelope has decreased dramatically due to fire and invasion by non-native vegetation. Thousands of acres of sagebrush habitat have been consumed by wildfire in recent years.

Piute Ground Squirrel – This species, which is also called the Great Basin ground squirrel, includes three sub-species. The sub-species occurs in the project area is *Spermophilus mollis idahoensis*. This sub-species is found north of the Snake River and south of the Payette River and Boise Mountains east to Glenn's Ferry and west to the Oregon border.

This species of squirrel hibernates for 6-7 months per year; approximately June through January in the project area. Preferred habitat is native shrubs, especially winterfat and sagebrush. Forage includes green vegetation, native grasses and their seeds and a few insects. Population densities can be quite high within the project area, although loss of habitat from wildfire has reduced the amount of preferred habitat by thousands of acres. Piute ground squirrel is an important prey species for many of the areas' raptors.

Brewer's Sparrow – Migratory birds are protected and managed under the Migratory Bird Treaty Act of 1918 as amended and Executive Order 13186. Accordingly, nests with eggs or young of migratory birds may not be harmed nor may migratory birds be killed. Executive Order 13186 directs Federal agencies to promote the conservation of migratory bird populations. Brewer's sparrow is a BLM Sensitive species and USFWS Bird of Conservation Concern throughout its breeding and wintering ranges (USDI 2008). The Audubon Society has given the Brewer's sparrow a watch list status of yellow, which indicates it is a declining or rare species (Butcher et al. 2007).

This sparrow is considered a sagebrush obligate species, meaning it requires sagebrush for some aspect of its life history. Brewer's sparrows are associated with sagebrush shrublands dominated by big sagebrush with perennial bunchgrasses (Paige and Ritter 1999). Knick and Rotenberry (1995) determined Brewer's sparrows were more likely to occur in sites with high shrub cover and large patch size, and associated with Wyoming big sagebrush communities. Schoeberl (2003) found nest success of Brewer's sparrow was adversely affected by fragmentation of habitat. This species has been documented in the vicinity of the project area but relatively few acres of suitable habitat exist within the project area.

Additionally, over the last decade, hundreds of thousands of acres of Brewer's sparrow habitat has been burned by wildfire in southern Idaho. Brewer's sparrow and other sagebrush obligate species that occupied those areas have been displaced, making the remaining sagebrush habitat more important and in need of protection from wildfires. Brewer's sparrow would benefit from the maintenance of large, continuous stands of sagebrush habitat.

Other migratory species within the project area include sage sparrow, sage thrasher, loggerhead shrike, western meadow lark, vesper sparrow, burrowing owl, and green-tailed towhee. The Brewer's, sage, and black-throated sparrows and loggerhead shrike are all Idaho BLM Sensitive Species.

Longnose Snake – This species of snake is only found in a small area of Idaho and there are no documented sightings within the project area. However, the longnose snake has been documented just outside the eastern boundary. Lack of documented sightings could be due to the crepuscular to nocturnal activity of the species or rarity within the project area. Preferred habitat consists of sites with shrub savanna, grasslands, and rocky canyons in desert areas. Longnose snakes use burrows during the day for refuge from high temperatures and predators.

Western Toad – This species inhabits a wide variety of habitat from desert sagebrush to mountain meadows and is distributed throughout Idaho. They are usually near some form of water and likely breed in early spring in Idaho. Western toads are generally active in twilight or during the night and take shelter during the day under logs, rocks, or in burrows of other animals. Loss of sagebrush from wildfire has altered habitat through much of the project area. The species has been documented in the project area and is likely more common than records indicate because the species is less likely to be observed during its general hours of activity. Additionally, most people would not consider reporting a sighting of this low profile species to wildlife officials.

3.3.2 Environmental Consequences

Impacts from the tools being proposed for fuel break development would be similar for each alternative. The main difference between alternatives is one of scale. While BLM has no control over what occurs on private land, many actions on private land will impact wildlife habitat and presence on adjacent BLM lands. These actions will be discussed in detail in the cumulative effects section but they may also be mentioned in the environmental analysis to illustrate their compounding effects within the project area and adjacent lands. Likely private land actions to continue include construction of housing, agriculture development, livestock grazing, and development of energy infrastructure. Increased use of public lands will also lead to greater pressure, disturbance, and loss of quality habitat for wildlife.

In addition to analyzing the potential impacts of fuel break development, it is important to compare potential impacts of the action alternatives to the impacts of no action, including the continued loss of habitat from wildfire and invasive vegetation. The risks of potential impacts from creating fuel breaks along the proposed treatment routes outweigh the risks of losing thousands of acres of wildlife habitat across the landscape. Additionally, while there is a chance that prostrate kochia may be transported by various means outside of the fuel breaks, it is not invasive (except in slick spots) and is easily controlled with herbicide. In stark contrast, the continued and uncontrollable spread of cheatgrass and medusahead increases the likelihood of future fires. Each subsequent wildfire in and adjacent to the project area leads to greater loss and degradation of wildlife habitat by consuming desirable vegetation and increasing the opportunity for invasive plants to become more dominant across the landscape. While ungulates and other species do forage on cheatgrass (Kohl et al. 2012; Austin et al. 1994), the loss of vegetation diversity caused by the invasion of cheatgrass is detrimental to wildlife habitat. Medusahead is described as worthless for wildlife by Stubbendieck et al. (1992). Prostrate kochia can be a

valuable food source for many species of wildlife. The project would benefit wildlife by reducing the likelihood of large scale wildfire and provide a valuable source of high protein forage from prostrate kochia. Approximately 330,000 acres of winter habitat has been burned by wildfires in and around the project area in the last three years. The 2013 Pony Complex and Elk Complex Fires (situated just to the north of the Pony Complex) alone burned approximately 130,000 acres of crucial mule deer winter habitat.

3.3.2.1 Alternative 1 – No Action

With selection of this alternative, fuel breaks would not be constructed and the ability of firefighters to effectively contain wildfires between 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 vegetation.

Greater Sage-grouse – Conditions for this species would be expected to continue to degrade in the project area from the spread of invasive annual grasses and increased fire frequency (Balch et al. 2013). Even in good sage-grouse habitat, a large wildfire would negatively impact sage-grouse for 25-120 years based on sagebrush species and growing conditions (Baker 2011). However, the project area is not good sage-grouse habitat and recovery would likely take longer within the project area due to the fire frequency and the level of infestation by invasive annual grasses. 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).

Knick and Hanser (2011) noted sage-grouse may continue to avoid burned areas even after sagebrush has recovered. They also found that fire, within 54 km (33.5 miles) of a lek, is one of two primary factors in predicting lek extirpation and even small increases in the amount of burned habitat surrounding a lek had a large influence on the probability of abandonment. Therefore, the loss of several thousand acres of habitat to fire, within a stronghold sage-grouse area, would have detrimental population consequences at the local, sub, and management zone population scale. Some leks within and adjacent to the project area have had several fires within 33.5 miles.

Garton et al. (2011) conducted a comprehensive analysis of sage-grouse populations throughout the species' range by accumulating and analyzing counts of males at 9,870 leks identified since 1965. Trends for the NGB population, as indicated by average number of males per lek, declined by 37% from 1965–1969 to 2000–2007. Average number of males per active lek followed the same pattern over the assessment period and declined by 17%. The sage-grouse carrying capacity in the NGB population is projected to decline by 73% between 2007 and 2037 if current trends continue (See Fed Register 2010 Vol 75 No. 55 citing Garton et al. 2011). Based on a minimum population estimate of 9,114 males in 2007, Garton et al. (2011) concluded there is a 100% probability that the population of sage-grouse in the Northern Great Basin would drop below 500 individuals in 100 years, which indicates a long-term risk of extinction for the population. Habitat loss from wildfire is a major driver for the estimates made by Garton et al. (2011) concerning the NGB population.

The impacts of future fires would compound the loss and degradation of sage-grouse habitat that has already occurred. Continued loss of sagebrush habitat and increased dominance of invasive annual grasses increase the likelihood of this species being extirpated in and adjacent to the project area.

There is one active lek in the project area (approximately 1.20 miles from a proposed treatment area) and one active lek within three miles of the project area. Research has shown 75 to >80% of nest sites are within a 4-mile radius of a lek (Hagen 2011; Sage-grouse National Technical Team 2011). Sage-grouse have been shown to have lower lek attendance (Johnson et al. 2011) and have lower nest initiation rates near roads (Lyon and Anderson 2003), although Gillan et al. (2013) did not find sage-grouse avoiding roads. Holloran (2005) found mature sage-grouse hens would continue to nest in areas of new infrastructure development due to nest-site fidelity and yearling hens avoided nesting near established infrastructure. Further study by Holloran et al. (2010) confirmed yearling female sage-grouse avoided infrastructure when selecting a nest site. The power lines and roads in the project area have been in place long enough that there are likely no hens nesting near them. Hens in the project area would likely select habitat away from anthropogenic features.

Raptors: Golden Eagle and Ferruginous Hawk – Continued loss of sagebrush habitat would negatively impact these raptor species, mainly because their preferred prey, black-tailed jackrabbits, would decrease. Sands et al. (1999) 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 were closely correlated with a loss of sagebrush cover, and current distribution was related to remaining habitat (Sands et al. 1999). The main alternative prey item in this area, the Piute ground squirrel also prefers areas with native shrubs, especially winterfat and sagebrush, although they can be found in high densities in native grasslands. Continuation of wildfires burning across the project area would negatively impact these raptor species.

Mule Deer – The project area is mainly used by mule deer during winter months, although the level of use is limited except in areas that still have shrubs present. Sagebrush and bitterbrush are important sources of winter forage and for providing thermal, and hiding cover. However, thousands of acres of sagebrush and bitterbrush habitat have been consumed by wildfire in recent years. The main strategy of a mule deer in winter is to survive by minimizing energy loss and by eating enough to prolong fat reserves. Deer commonly seek winter ranges where there is good thermal cover to minimize energy loss. Cover, aspect, and elevation are recognized as crucial components, and during certain times are more important than food (Rachael 2011). Forbs and grasses are an important part of the mule deer diet and usually consumed during spring and early summer.

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. Continued loss of sagebrush habitat from wildfire within the project and adjacent areas would lead to further degradation to the suitable winter habitat by concentrating mule deer in those areas.

Piute Ground Squirrel – This squirrel prefers areas with native shrubs. Findings from Steenhof et al. (2006) confirmed shrub habitats provide more favorable environments for squirrels than grass habitats. By studying the effects of drought and prolonged winter on Townsend's ground squirrel (a species with a similar life history to Piute ground squirrel) on the SRBP, Van Horne et al. (1997) found the implications of loss of shrubland refugia may be severe for ground squirrels and their predators. Furthermore, the findings of Van Horne et al. (1997) indicate replacement of native bunch grasses and shrubs by cheatgrass would have a strong negative impact on ground squirrel populations and the raptors that prey on them. Yensen et al. (1992) also identified Piute ground squirrels were negatively impacted and populations declined in response to cheatgrass invasion. Continued loss of shrubs and native grasses to wildfire and invasive vegetation within the project area would negatively impact this species and, therefore, raptor species.

Brewer's Sparrow – This species is a sagebrush obligate. Holmes and Johnson (2005) identify fire as a threat to sagebrush obligate migratory bird species because it removes shrub cover, fragments large sagebrush tracts, and can reduce patch size to unacceptable levels. Knick et al. (2005) found birds using sagebrush as their primary habitat declined dramatically in landscapes where shrub removal was complete and at large scales. Well over one million of acres of sagebrush habitat have burned in southern Idaho and southeast Oregon since 2007, and additional loss of habitat would exacerbate the impacts to this species (Wiens and Rotenberry 1985; Knick and Rotenberry 1995; Knick and Rotenberry 2000). While there is little habitat within the project area, continued burning within the project area prevents shrub recovery and allows invasive annual grasses to increase in dominance, reducing the likelihood of habitat restoration.

Longnose Snake – Habitat for the longnose snake would be altered in the event of wildfire burning native vegetation. A study completed in California suggests effects to habitat suitability and predator-prey interactions were largely responsible for the changes observed in abundance and diversity of reptiles after wildfire (Rochester et al. 2010). The habitat within and adjacent to the project area is infested to some degree with cheatgrass and medusahead, with many portions of the project area heavily infested. These invasive annual plants gain greater dominance after each fire event. There is only one study, Hall et al. (2009), that focuses specifically on the effects of cheatgrass to snakes. Hall studied abundance of two species of snakes in Utah, and found lower abundance at sites with high percentages of cheatgrass.

The results of Hall et al. (2009) are in line with current research specifically examining the effects of cheatgrass on various species. For instance, research has shown cheatgrass impacts the abundance of small mammals (Hall 2012; Gano and Rickard 1982; Yensen et al. 1992), birds (Wiens and Rotenberry 1985; Knick and Rotenberry 1995; Knick and Rotenberry 2000), lizards (Mortensen 2004 as cited by Hall 2012), and beetles (Rickard 1970 as cited by Hall 2012). While Hall et al. (2009) did not study longnose snakes, the results would likely be similar for this species.

Western Toad – There is little information concerning the effects of fire in sagebrush steppe habitat on western toad and amphibians in general. Available data suggest amphibian responses to fire and associated habitat alteration are species specific, incompletely understood, and

variable among habitats and regions (Pilliod et al. 2003). Most research indicates minimal fire related impacts and there have been some reports of positive effects for western toads (Hossack and Corn 2007; Hossack and Pilliod 2011; Pilliod et al. 2003; Bury 2004). Rochester et al. (2010) found that western toad was detected in fewer plots in chaparral habitats after they had burned, but the capture rate did not change across the study area and toads remained the most common amphibian. However, the indirect effect of having areas become dominated by cheatgrass or medusahead would expectedly have greater effects than direct effects of wildfire.

Litt and Pearson (2013) indicate that cheatgrass and medusahead affect native wildlife through both habitat and non-habitat pathways and via both direct and indirect effects. Several studies indicate the negative impacts of invasive annual grasses to a variety of species (see last paragraph for longnose snake in this section). Thick stands of cheatgrass and medusahead likely negatively impact mobility of western toad and conversion of areas to cheatgrass and medusahead would reduce prey species . Therefore, while impacts from the occurrence of fire may have little impact to western toad, the loss of habitat to invasive annual plants following fire would likely have long-term negative impacts for this sensitive species.

3.3.2.2 General Effects

The potential effects of each method or tool proposed for use is discussed below. As identified previously, the maximum treatment acres by alternative would not likely be possible for some methods due natural constraints such as geography and geology, and due to restrictions needed to protect resources, such as timing restrictions, minimal disking in sage-grouse PPH and PGH,and no disking in occupied LEPA habitat. While maximum potential acres by alternative are analyzed, the actual treatment acres for each method would be less.

Herbicide

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 (PEIS) (USDI BLM 2007a) and risks to various groups of wildlife are illustrated in Table 3.8. The PEIS states that based on ecological risk analyses (ERAs) 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. Additionally, 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 (USDI BLM 2007a). However, harmful doses of herbicide are not likely unless the animal forages exclusively in the treatment area for an entire day (USDI BLM 2007a). The likelihood of animals foraging for an entire day in the proposed treatment area is not likely because herbicides would be applied in a narrow strip adjacent to roads with reduced hiding cover and where there is a greater potential of human activity. The probability of harmful contamination is further reduced by the minimal area treated within the large landscape of the project area.

Analysis of herbicide effects to the species in this EA were also based on the *Final Biological Assessment: Vegetation Treatments on Bureau of Land Management Lands in 17 Western States* (USDI BLM 2007). Although the biological assessment did not analyze the effects to the same

species being analyzed in this EA, representative species were selected from the biological analysis. For example, the potential impacts of herbicides to the northern Alpomado falcon were used to describe the potential impacts to golden eagle and ferruginous hawk; and the potential impacts of herbicides to the northern Idaho ground squirrel were used to describe the potential impacts to Piute ground squirrel.

Table 3.8 - Risk Categories Used to Describe BLM and Forest Service-evaluated Herbicide Effects on Non Special Status Wildlife According to Exposure Scenario (USDI 2007a, p. 4-103 & 4-107)

Application Scenario	2,4-D[1]		CHLOR		DICAMBA		CLOP		METS		PICL		TRIC		IMAZ		GLYP	
	Typ[2]	Max	Typ	Max	Typ	Max	Typ	Max	Typ	Max	Typ	Max	Typ	Max	Typ	Max	Typ	Max
Direct Spray of Terrestrial Wildlife																		
Small mammal – 100% absorption	0[3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pollinating insect – 100% absorption	L	L	0	0	0	L	0	0	L	L	L	M	0	0	0	0	0	0
Small mammal – 1st order dermal Absorption	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Indirect Contact with Foliage After Direct Spray																		
Small mammal – 100% absorption	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pollinating insect – 100% absorption	0	0	0	0	0	0	0	0	0	0	0	L	0	0	0	0	0	0
Small mammal – 1st order dermal Absorption	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ingestion of Food Items Contaminated by Direct Spray																		
Consumption of contaminated small mammal, predatory bird – acute[4]	L	L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Small mammalian herbivore – acute	0	L	0	0	0	0	0	0	0	L	0	L	0	0	0	0	0	0
Small mammalian herbivore – chronic[5]	0	L	0	0	0	L	0	0	L	M	L	M	0	0	0	0	0	0
Large mammalian herbivore – acute	0	L	0	0	0	L	0	0	0	M	0	L	0	0	0	0	0	0
Large mammalian herbivore – chronic	L	M	0	0	0	L	0	0	L	M	M	H	0	0	0	0	L	M
Small avian insectivore – acute	H	H	0	0	L	M	0	0	0	M	0	L	0	0	0	0	0	0
Large avian herbivore – acute	M	H	0	0	0	0	0	0	0	L	0	L	0	0	0	0	0	0
Large avian herbivore – chronic, on-site	M	M	0	0	0	0	0	0	L	H	0	M	0	0	0	0	0	0

1 BROM = Bromacil; CHLOR = Chlorsulfuron; CLOP = Clopyralid; METS = Metsulfuron methyl; PICL= Picloram; TRIC = Triclopyr; IMAZ = Imazapic; GLYP = Glyphosate.

2 Typ = Typical application rate; and Max = Maximum application rate.

3 Risk categories: 0 = No risk (majority of RQs < most conservative Level of Concern (LOC) for non special status species); L = Low risk (majority of RQs 1-10x most conservative LOC for non special status species); M = Moderate risk (majority of RQs 10-100x most conservative LOC for non special status species); and H = High risk (majority of RQs >100 most conservative LOC for non special status species). The risk category is based on the risk level of the majority of risk quotients observed in any of the scenarios for a given exposure group and receptor type. The reader should consult the risk tables in Chapter 4 of the ERAs (ENSR 2005b-k) to determine the specific scenarios that result in the displayed level of risk for a given receptor group.

4 Acute = Short-term Exposure

5 Chronic = Long-term Exposure

Greater Sage-grouse

The proposed fuel breaks would be developed along roads, a power line corridor, and near human infrastructure. Sage-grouse hens in this area would likely avoid establishing a nest in a proposed fuel break area due to the anthropogenic disturbances (See last paragraph under sage-grouse in Section 3.3.2.1). The project design feature specifing that no work would be completed within three miles of and active lek during the breeding and nesting period, further reduces risks to sage-grouse.

The likelihood of measurable negative impacts to sage-grouse from any of the proposed methods being analyzed for fuel break development is negligible, even when completed in PPH and PGH. This is because project design features limit the implementation of some tools in both PPH and PGH and based on two years of telemetry data that indicates actual use of the project area by sage-grouse is low. Minimal use of the project area is likely related to the loss of suitable habitat through the project area to wildfire, the spread of invasive annual plants, and the presence of human infrastructure and activity. While the proposed action could reduce sage-grouse habitat along some routes, the potential benefits of reducing the impacts of wildfire across the landscape outweigh the risks of establishing fuel breaks.

Prostrate kochia Fuel Breaks – Vegetated fuel breaks would be up to 50' feet wide on each side of a route in PPH and 100' each side in PGH, which would reduce sagebrush. Fuel breaks of prostrate kochia along selected routes would not negatively impact sage-grouse. While sagebrush cover would be reduced in PPH and PGH, this habitat is along roads or near other human infrastructure to which sage-grouse show some level of avoidance (Gillan et al. 2013; Hanser et al. 2011; Braun 1998). Sage-grouse have been observed utilizing areas vegetated with prostrate kochia (Paul Makela 2013, personal communication; Graham and Messmer 2013). Effective fuel breaks of prostrate kochia would improve conditions over the long-term by reducing wildfire and the spread of cheatgrass and medusahead. Compared to the current condition and trend of habitat loss from wildfire, establishing effective fuel breaks with prostrate kochia outweigh any potential risks to sage-grouse.

Disking – Disked fuel breaks would be no greater than 25 foot wide on each side of a route in not be completed in PPH and PGH.

Bare soil fuel breaks created along routes by disking would remove all cover for sage-grouse. Twenty-five feet of disking on each side of a route, plus the width of the road bed could lead to open areas devoid of cover up to 100 feet. Potential impacts to sage-grouse from disked areas include fragmentation of habitat, increased vulnerability to predation, increase of noxious weeds and invasive annual plants, and loss of habitat. However, the potential effects from disking are not expected to result to measurable effects due to the low level of use of the project area by sage-grouse, and based on the following rationale.

- *Fragmentation:* Disking would not result in fragmentation of habitat based on the results of telemetry work completed on sage-grouse in and adjacent to the project area which document sage-grouse crossing Highway 20 as part of their annual movement between habitats. Some individuals crossed this heavily used highway several times. While sage-grouse normally avoid anthropogenic features, the highway intersects historic migration routes. Of the 10 birds being tracked, only three were not shown to cross Hwy 20, but these three birds died

before moving to late fall and winter habitat which would have likely led them to areas across the highway.
Of the other seven grouse tracked from April 2011 until July 2012, all crossed the highway at least twice while moving between seasonal habitats. The documented movements of the tracked birds indicate they will readily cross a high use highway devoid of cover. Therefore, it seems reasonable to conclude that sage-grouse would readily cross the proposed fuel breaks which would likely be a shorter or similar distance across roads with much less vehicle traffic. Additionally, the recent data from two winters of telemetry tracking indicate minimal use of the project area by sage-grouse.

- *Increased Vulnerability to Predation:* Sage-grouse crossing open areas are obviously more visible than in areas with vegetation. Tracking data from April 2011 to July 2012 indicate the documented sage-grouse mortalities were not likely due to crossing Hwy 20. This inference is based on the location of where the transmitters were discovered in relation to the time of year and the documented pattern of movements. Based on the low level of use of the project area by sage-grouse and the limited area of bare ground from disking, there is little likelihood of this type of fuel break increasing predation on sage-grouse.
- *Noxious Weeds/Invasive Annual plants:* The desired condition of a disked fuel break is to have bare soil with no vegetation present. The disked fuel breaks would not contribute to the current spread of invasive annual plants or noxious weeds because they would be maintained as bare soil.
- *Loss of Habitat:* It has already been shown that habitat loss within the project area is occurring at a large scale and is an ongoing issue. The main reason for the loss of habitat is wildfire and the subsequent invasion and dominance by invasive annual plants. The amount of habitat converted to fuel breaks by disking would be minimal compared to the thousands of acres habitat that have been destroyed wildfire. Additionally, the fuel breaks are proposed along roads, often near other human infrastructure including homes, railways, and beneath powerlines.

Mechanical Thinning and Mowing – As identified in the SOPs, mow strips in PPH or within one mile of an active occupied sage-grouse lek would not be wider than 50’ on each side of a route. Beyond the 50’ of mowing in PPH, sagebrush may be thinned by hand to approximately 5 - 10% canopy cover for another 50’. Mow strips in PGH would not be wider than 100’ on each side of a route and sagebrush may be thinned by hand beyond the 100’ of mowing in PGH to approximately 5 - 10% canopy cover for another 100’. The height of sagebrush would be reduced along routes to be 6-12 inches in height.

Sage-grouse regularly utilize and travel through areas of low sagebrush so reducing structure of larger shrubs to a height of 6-12 inches would not preclude sage-grouse from utilizing those areas. Destin Harrell (BLM Biologist, Cody, Wyoming) observed sage-grouse roosting in mowed sagebrush strips (personal communication, 2011). Sage-grouse regularly utilize mowed alfalfa fields when available (USFWS 2010a citing Schroeder et al. 1999; Connelly et al. 2000), and open grassy meadows grazed by livestock (USFWS 2010a citing Klebenow 1981). Shrub structure would be altered but sage-grouse would not avoid treated areas.

Potential impacts to sage-grouse from mowing sagebrush include fragmentation of habitat, increase of noxious weeds and invasive annual plants, and loss of habitat.

Herbicide – Effects of herbicide application within the project area to sage-grouse would be negligible because use of the project area by sage-grouse is low and mainly occurs during winter months. During winter months, sage-grouse forage exclusively on sagebrush (USFWS 2010a), which would not be targeted for herbicide treatment. A comparison of applied levels of herbicides with toxicity studies of grouse, chickens, and other gamebirds (Carr 1968, as cited in Call and Maser 1985) concluded herbicides applied at recommended rates should not result in sage-grouse poisonings. Therefore, the potential for contamination as presented in Table 3., is an overly conservative estimate. Furthermore, the predictions of potential adverse effects from herbicides are overly conservative because they assume 100% of the animal's diet would consist of contaminated vegetation, which would be unlikely unless the animal's entire habitat was treated (USDI BLM 2007a). The probability of sage-grouse consuming 100% contaminated vegetation with implementation of any of the alternatives in this EA are almost non-existent because sagebrush would not be targeted for herbicide treatment and the diet of sage-grouse during winter months consists exclusively of sagebrush. Additionally, even if sage-grouse were in the project area throughout the year, they would not forage entirely within developed fuel breaks adjacent to roads.

Targeted Grazing – Using this tool to create a fuel break would reduce but not eliminate cover for sage-grouse. The potential impacts from targeted grazing to sage-grouse include reduced nesting cover, disturbance to nesting hens, trampling of nests, and collisions with temporary fences. In general, the likelihood of these potential impacts actually occurring is minimal because of the low numbers of sage-grouse utilizing habitat in the project area.

While collisions with temporary fences could occur, the low level of sage-grouse use within the project area makes this unlikely and the chances of collisions are further reduced through implementation of the standard operating procedure regarding temporary fences.

Raptors: Golden Eagle and Ferruginous Hawk

The effects of fuel break development would not lead to measurable short or long-term negative effects to golden eagles or ferruginous hawks. While direct mortality or injury from implementation of the project could occur; the likelihood is minimal because raptors would simply move away from machinery or workers. The greatest potential effect to raptors resulting from development of fuel breaks would be reduction to prey species (the term "prey species" refers to black-tailed jackrabbits and Piute ground squirrels). Disturbance during breeding and nesting would not occur due to required surveys and buffers near active nests. Without treatment, the potential of reducing large fires and reducing the degradation of habitat in the project area would not be realized.

Continued loss of sagebrush habitat and the subsequent spread and dominance of cheatgrass and medusahead (general effects of Alternative 1) would lead to reduced prey populations. The reduction in available prey would negatively impact these raptor species. The impacts to habitat from fuel break development along roads, powerlines, or adjacent to human infrastructure would be far less than the loss from a single large fire consuming habitat across the project area. Reducing fire and the spread of invasive annual plants would lead to long-term benefits to golden eagles and ferruginous hawks.

Herbicide – Common prey of golden eagle and ferruginous hawks have a low probability of contamination from the herbicides proposed for use. The herbicide 2,4-D poses a moderate risk of

adverse effects to jackrabbits and squirrels if they are directly sprayed, or if they were to consume contaminated vegetation. There are thousands of acres of habitat for these raptors to use for hunting so the percentage of prey that comes from treated areas would likely be low. The potential of adverse impacts to golden eagles and ferruginous hawks from application of herbicides would be low.

Mule Deer

There would be few direct impacts associated with the development and maintenance of fuel breaksbreaksbreaksbreaks in the project area. Mule deer, and antelope, may be disturbed by vehicles and other implementation tools but they could simply move fromfrom the disturbance.

Fuel breaks consisting of prostrate kochia would provide a valuable food source during winter months for ungulates in the area. There is a potential for increased incidence of collision induced mortality by establishment of prostrate kochia near roads, with the greatest concern near Highway 20 and I-84 due to the higher speed limits. Seedings of prostrate kochia exist on both sides along some sections of I-84 between Simco Rd and Mountain Home, including some areas within the right-of-way. Crested wheatgrass has also been planted in the right-of-way along many miles I-84 between Boise and Mountain Home. Data from the Idaho Department of Transportation (IDOT) indicate that incidence of collision with wildlife along I-84 between Boise and Mountain Home is low, with 21 incidents from 2003 to 2012 IDOT Data 2003-2012). There were 35 collisions with wildlife between Mountain Home and Glenn's Ferry from 2003 to 2012. Additionally, two daily commuters from Mountain Home to Boise stated that mule deer or elk are rarely seen along the I-84, and incidence of collisions appears to be very low (Todd Floyd and Steve Acarregui, Personal Communication, 2014). Antelope are frequently seen foraging in the prostrate kochia on the north side of I-84 near Lockman Butte, but a roadside fence that has a mesh bottom section keeps antelope from moving through the fence into the right-of-way. Since antelope rarely jump fences, it is uncommon for them to cross the interstate. Prostrate kochia would be planted on many miles of routes that would be away from Highway 20 and I-84, which would lessen the draw of ungulates to those specific routes. Areas of low growing vegetation would likely make ungulates more visible to drivers.

Fencing associated with project implementation may also negatively impact mule deer and other ungulates. However the design feature requiring all fencing associated with project is marked would reduce the likelihood of mortality and injury to mule deer.

Herbicide – The likelihood of impacts to mule deer are very low because herbicide use would occur when most deer are on their summer range. Additionally, it is very unlikely that deer would forage exclusively along treated areas due to limited hiding in fuel breaks.

reducing wildfire and the spread of invasive annual plants in and adjacent to the project area would improve habitat conditions and benefit mule deer and other large ungulates.

Piute Ground Squirrel

Prostrate kochia Fuel Breaks – Establishing prostrate kochia fuel breaks would reduce cover in areas where stands of sagebrush and other shrubs currently exist. However, in areas where non-

native annual grasses are present, establishing prostrate kochia would improve habitat conditions and benefit this species. While no studies to date have been completed on the effects of forage prostrate kochia on ground squirrels, Piute ground squirrels have been observed existing in high numbers within fuel breaks of prostrate kochia. Prostrate kochia could be especially useful during years with poor production and early desiccation of grasses, which causes squirrels to enter hibernation earlier than normal and in poor condition to survive through the winter. During a drought, Townsend's ground squirrels on sagebrush-dominated sites were more likely to persist than squirrels in grasslands. Van Horne et al. (1997) speculated that sagebrush leaves provided alternative forage on sagebrush sites, and shade associated with habitat structuring may have enhanced the probability of finding succulent forage. Furthermore, Van Horne et al. (1997) indicate drought could greatly reduce ground squirrel densities, enhancing the risk of localized extinction. Prostrate kochia would provide Piute ground squirrels a beneficial source of forage even during times of drought. Waldron (2011) states prostrate kochia is extremely drought tolerant. Compared to the continued spread and habitat degradation caused by invasive annual plants, the proposed fuel breaks of prostrate kochia would be beneficial to squirrels. This is because prostrate kochia competes well with invasive annual plants, effectively helps control wildfire, and provides high protein forage.

Disking – Tractors and equipment used to disk fuel breaks could harm or kill squirrels by crushing them directly or in their burrows, or hitting them with the disks. However, creation of disked fuel breaks or disking to prepare for planting fuel breaks would occur during the time squirrels are hibernating. Reynolds and Wakkinen (1987) reported an average depth of 37" for home burrows of adult, which is similar to the 34 inch average depth reported by Alcorn (1940). Disking could impact burrows and potentially cause some mortality to squirrels but it is unlikely that the hibernation chambers, which have an average depth of 33-37 inches would be crushed. Hibernating ground squirrels plug their burrows during hibernation to protect themselves from predators and for temperature control, therefore, while disking could impact burrows, it is unlikely to cause squirrels to suffocate. Disking over hibernating ground squirrels seemed to have limited or negative impacts to squirrel numbers in south eastern Oregon (Mike McGee, personal observation 2007; Lance Okeson, personal communication 2014).

If permanent fuel breaks were created by disking, they would not provide habitat for Piute ground squirrels. Crossing the disked areas would make them more susceptible to predation. While disked areas would make road crossing more difficult and perilous, it would not preclude them from doing so. Narrower disked fuel breaks (less than the potential maximum of 50') would reduce the impacts associated with this method.

Mechanical Thinning and Mowing – Tractors and equipment used to mow sagebrush could harm or kill squirrels by crushing them directly or in their burrows. However, squirrels would be hibernating at a depth sufficient so there would be minimal risk of squirrels being harmed by the mower. Mowing would reduce cover and lead to a change in vegetation, which would provide forage in areas with native grasses and forbs. An increase of undesirable vegetation such as cheatgrass would be treated with herbicide to improve vegetation composition, which in the end would benefit Piute ground squirrels and other small mammals.

Herbicide – During herbicide treatments, any Piute ground squirrels unable to flee the area could be inadvertently injured or killed by trucks or ATVs used to apply herbicides. Although direct spray of

Piute ground squirrels is unlikely, it could potentially occur during herbicide treatment programs in the species' habitat outside of the hibernation period.

While there is potential for direct adverse effects to the species (Table 3.), the likelihood of such is minimal and, as a result of the project design features (p. 24; Table 3.8), negative effects are not expected to occur.

Targeted Grazing – Disturbance to Piute ground squirrels from targeted livestock grazing would not occur but negative effects could occur through competition for forage and surface damage to burrows. If this method is employed, the potential negative effects would be confined to a small percentage of the proposed fuel breaks and would vary depending on the class of livestock used. Heavier animals such as cattle would be more likely to crush burrows. Shrub cover would remain but cover from grasses and forbs would be minimal. Squirrel use in areas treated by targeted grazing would likely decrease due to reduced forage and cover but because this method would only be used in areas where other treatments are not feasible, the potential for measurable effects is minimal.

Prescribed Fire – Fire would mainly be utilized in areas with thick infestations of annual grasses, which do not provide suitable habitat for Piute ground squirrels. Prescribed fire would remove thick buildup of annual grass debris and destroy viable seeds of cheatgrass and medusahead. Because annual grasslands are not a preferred habitat for Piute ground squirrel (Yensen and Sherman 2003) and densities are often low in annual grasslands (Yensen et al. 1992), there is minimal risk from using prescribed fire to prepare an area for seeding. However, there is still the possibility some injury or mortality of squirrels could occur during a prescribed fire. Prescribed fires occurring during hibernation would pose the lowest risk of directly affecting squirrels.

Initially, squirrel numbers may be reduced, by predation, due to lack of cover and forage but because areas where prescribed fire is used would be seeded with native or suitable non-native species, there would be long-term benefits to squirrel habitat.

Seedings – At the time seeding would be implemented (fall through early winter) Piute ground squirrels would be hibernating. Any damage occurring to burrows would not compact the soil to a depth leading direct harm to hibernating squirrels. There is low risk of squirrels being harmed from seeding implements, especially when using a minimum till drill-seeder. Seeded areas would provide minimal cover during vegetation establishment. Although there would be a period of reduced cover during establishment, effective fuel breaks would provide long-term benefits to Piute ground squirrels including cover and forage.

Migratory Landbirds: Brewer's Sparrow

Overall, the likelihood of measurable negative effects to Brewer's sparrow is low due the limited amount of shrub habitat in the project area and due to reduced usage of habitat along roads. Shrub areas would have limited treatment in PPH and PGH which would minimizes loss of habitat for birds preferring sagebrush habitat. Fuel break development in areas outside of shrub habitat would have minimal negative impacts to migratory birds. The potential for direct mortality is low due to the high mobility of birds and project implementation would not occur during the breeding and nesting season. Creation of fuel breaks would lead to short-term displacement due to the presence of

humans and mechanized equipment. Impacts to sagebrush habitat structure would be long-term impacts that may change bird species composition in mowed areas.

Herbicide – The acute risk from 2,4-D to Brewer's sparrow and other birds foraging on insects is high, however, the PEIS (USDI BLM 2007a) suggests that 2,4-D should not be applied over large areas where foragers would only consume contaminated food. The maximum fuel break acres proposed by any alternative are 21,380, which is less than 10% of the 293,891-acre project area. While it is unlikely that birds would only forage in the fuel breaks and that 2,4-D would not be used across all fuel breaks, there is still a low risk that a very low number of birds could be impacted.

Habitat loss from the spread of invasive vegetation and wildfire is expected to continue and would have long-term negative impacts to migratory birds while effective fuel breaks would provide the opportunity to reduce the impacts of fire and lead to improved conditions.

Longnose Snake

The most likely impact to longnose snake would be reduced habitat. Impacts from developing fuel breaks (machinery, workers, tools) would be negligible due to the snake's crepuscular and nocturnal behavior. Disking is the only method which could have long-term negative impacts to longnose snake. Disked fuel breaks would create areas of unsuitable habitat for longnose snake due to the lack of cover and they would be more vulnerable to predators. Impacts from herbicide, to snakes and other reptiles, would be negligible as described in Table 3..

Table 3.9 - Summary of Effects to Herpetofauna From Ingestion of Food Contaminated by Herbicides, as Predicted By Risk Assessments (USDI BLM 2007b)

Species	Food (During Terrestrial Stage)	Summary of Effects[1]
Longnose Snake	Vertebrates	Negative effects from 2,4-D, glyphosate, or triclopyr at the typical application rate; negative effects from clopyralid at the maximum application rate.
Western Toad	Invertebrates	Negative effects from 2,4-D, glyphosate, or triclopyr at the typical application rate; negative effects from clopyralid at the maximum application rate.

[1]Both acute and chronic effects were considered, and "negative effects" include either acute or chronic effects, or both.
Acute = Short-term Exposure
Chronic = Long-term Exposure

Potential impacts to longnose snakes and other reptiles from development of fuel breaks are negligible when compared to the effects of habitat loss caused by wildfire and presence of invasive annual grasses.

Western Toad

While there are risks associated with development of fuel breaks, the treatment area represents a small fraction of the habitat within the project boundaries. Direct injury or mortality is unlikely due to the timing of implementation and the species ability to occupy habitat outside of the fuelbreaks.

Reducing the continued loss of sagebrush steppe habitat to wildfire and invasion of non-native grasses would benefit this species.

3.3.2.3 Alternative 2

This alternative would implement the proposed action of developing vegetated fuel breaks of prostrate kochia, although all the methods of establishing fuel breaks are available for the decision maker to choose from. Fuel breaks are proposed along 187 miles of routes for a total of approximately 294 miles of fuel breaks. Fuel breaks at the maximum proposed width of 300' on each side of a route would equal 21,380 acres. However, due to concerns for cultural, LEPA, and wildlife resources, there would be restrictions precluding implementation of the maximum width and the total acres impacted would be less than 21,380. While this alternative proposes the greatest number of miles of fuel breaks, it would also provide the greatest likelihood of reducing impacts to wildlife habitat across the project area and adjacent areas.

Greater Sage-grouse

This alternative includes development of fuel breaks along five miles of PPH and 25 miles of PGH.

Prostrate kochia Fuel Breaks – Vegetated fuel breaks would be up to 50 feet wide on each side of a route in PPH and 100 feet each side in PGH, which would reduce sagebrush habitat by approximately 61 acres PPH and approximately 606 acres in PGH. Likelihood of impacts to sage-grouse would be negligible based on the rationale provided for sage-grouse in Section 3.3.2.2.

Disking – If disking were to occur along the five miles of routes within PPH and the 25 miles of routes within PGH, it would reduce those habitat types by approximately 15 and 76 acres respectively. If the maximum width of 50 feet was disked in the remaining shrub habitat outside of PPH and PGH it would equal 327 acres.

Based on the low number of acres potentially impacted in PPH, PGH, and other shrub habitat from disking and based on the analysis and rationale in Section 3.3.2.2, effects of bare soil fuel breaks to sage-grouse would be negligible.

Mechanical Thinning and Mowing – Mowing and thinning up to a width of 300 feet along each side of the approximately 32 miles of big sagebrush and mountain shrub species would impact up to 2,327 acres, which represents approximately 2% of the 96,485 acres of shrub habitat in the project area. Mowing could occur for up to 50 feet on each side of a route in PPH and up to 100 feet wide on each side of a route in PGH which would impact a maximum of 61 acres of PPH and 606 acres of PGH. A total of approximately 2,994 acres of shrub habitat could be impacted. Likelihood of impacts to sage-grouse would be negligible based on the rationale provided in Section 3.3.2.2.

Herbicide – All 21,380 acres of fuel breaks with this alternative could potentially be treated and some areas would likely have to be treated more than once. Likelihood of impacts to sage-grouse would be negligible based on the rationale provided in Section 3.3.2.2.

Targeted Grazing – Impacts from targeted grazing would be negligible based on the rationale provided in Section 3.3.2.2.

Prescribed Fire – Impacts from prescribed fire would be negligible based on the rationale provided in Section 3.3.2.2.

Seedings – Impacts from seeding would be negligible based on the rationale provided in Section 3.3.2.2.

All Other Wildlife Species

There would be impacts of up to 21,380 acres to wildlife habitat from the various tools proposed, according to the analysis provided in Section 3.3.2.2.

3.3.2.4 Alternative 3

The remainder of the alternatives analyzed in this EA is similar to the proposed action in regards to the preferred design of fuel breaks being vegetated with prostrate kochia but all the methods of establishing fuel breaks are available for the decision maker to choose from. Alternatives 3 – 6 vary according to the routes selected and the number of miles proposed for fuel break development. Because none of the remaining alternatives proposed would have greater impacts than the proposed action, an in-depth analysis of the effects of this alternative is not necessary. A general discussion of acreage differences for PPH and PGH are provided with the level of risk associated.

Implementation of this alternative would impact approximately 27 acres of PPH, which is 56% less than Alternative 2 and impacts to PGH would be approximately 468 acres, 20% less than Alternative 2. The potential impacts and benefits to sage-grouse and other wildlife from developing vegetated fuel breaks with prostrate kochia or by using one of the other methods analyzed along the proposed routes in this alternative would be nearly the same as those for Alternative 2 and outweigh the risks associated with the No Action Alternative.

3.3.2.5 Alternative 4

Potential impacts to wildlife from establishment of fuel breaks would be reduced due to the fewer miles altered, but the likelihood of impacting more acreage from wildfire increases as there would be fewer miles of fuel breaks to slow fire spread and from which firefighters can initiate suppression. The amount of PPH that could be impacted is the same as Alternative 2 but impacts to PGH would be approximately 368 acres, 40% less than Alternative 2 and approximately 25% less than Alternative 3.

3.3.2.6 Alternative 5

Overall, the potential effects would be similar to Alternative 4 but the habitat north of Mayfield Rd would be at greater risk without fuel breaks being developed along Mayfield Rd. Impacts to PPH would be approximately 27 acres, 56% less than Alternatives 2 and 4. Impacts to PGH would be approximately 280 acres, 55% less than Alternative 2, 53% less than Alternative 3, and 25% less than Alternative 4.

3.3.2.7 Alternative 6

Approximately 87 miles of fuel breaks would be established along the 84 miles of routes. These fuel breaks would be located along the routes with the most fire ignitions including I-84, Hwy 20, and the railroad south of I-84. This alternative has the least amount of risks to wildlife and wildlife habitat of all the action alternatives but it also provides the least amount of opportunity to protect habitat for wildlife across the project area and adjacent areas.

No PPH or PGH would be altered from fuel break development.

3.3.3 Cumulative Effects

The scope of cumulative effects varies by wildlife species and is identified by species. Past, present, and future actions that have occurred in the analysis area are listed on pages 24 and 25. The temporal scope of analysis for the action alternatives would be three years following treatment, which would allow time for seeded fuel break to develop. It is expected, based on observations of wildlife response to fuel break development in eastern Oregon (Michael McGee, Personal Observations), that wildlife would not avoid treated areas. However, a large landscape level fire may have cumulative impacts that would last for decades.

3.3.3.1 Alternative 1 – No Action

Analysis of cumulative effects for implementation of this alternative evaluates the impacts of fire within the project area and actions within the scope of analysis. However, an exact boundary for scope of analysis would be speculative, due to variable conditions resulting from the unknown size of future fire events. Effects from large fires to each species being analyzed were previously discussed in the environmental effects and will not be re-stated here.

Note - Since control of wildfire would not be enhanced, cumulative impacts for this alternative are analyzed in relation to how past, present, and future actions would affect habitat recovery after a fire.

Greater Sage-grouse –

The scope for sage-grouse would include the area within the Mountain Home sage-grouse planning area.

This analysis area was determined to be sufficient because:

- The furthest distance travelled from winter habitat to summer habitat by a sage-grouse in the project area was approximately 23 miles. This 23 mile distance was then buffered by broadening it an additional 10 miles to include potential outliers.
- The sage-grouse scope of analysis area for cumulative effects incorporates all seasonal habitats identified for the sage-grouse tracked in and near the project area.
- Knick and Hanser (2011) state small increases in the amount of area burned, particularly in the 33.5-mile region surrounding a lek had a large influence on the probability of lek abandonment. The cumulative effects area includes landscape characteristics at a 34 mile (54km) radius that may influence sage-grouse seasonal movements and incorporates habitat used outside of the breeding season (Knick and Hanser 2011; Leonard et al. 2000).

Livestock Grazing and Trailing – Suitable sage-grouse habitat takes many years to reestablish after being destroyed by fire. Sometimes there is no recovery, due to establishment of non-desirable vegetation and altered fire regimes. There are differing views on the impacts of grazing in recently burned areas. Bates et al. (2009) found no difference between grazed and ungrazed plots after a low severity, fall season prescribed fire. The fire in their study caused minimal, if any, mortality to perennial bunchgrasses but the study was coupled with an exceptionally wet spring during the study and there was a lack of a significant weed presence. Bates et al. (2009) also stress the grazing in their study was closely supervised, which is necessary during post-fire vegetation recovery. Although Bunting et al. (1987) was discussing management after prescribed fire; their statement is probably more valid for areas burned by wildfire due to the more destructive characteristics of wildfires compared to prescribed fires. They state "if livestock have premature access to a burned area, negative impacts to vegetation recovery may result unless management (close supervision) of

the livestock occurs" (Bunting et al. 1987). They also identify the amount of non-use necessary after a fire varies considerably with the vegetation composition, site conditions, and objectives of recovery (Bunting et al. 1987). Grazing typically resumes within two growing seasons after a fire. Post-fire management of livestock, both short and long-term, is essential for long-term maintenance of desired sagebrush canopy cover and herbaceous understory (Wyoming Interagency Vegetation Committee (WIVC) 2002). The WIVC guide (2002) indicates the follow-up grazing strategy must be designed to maintain healthy, perennial plant cover. The challenge to maintaining a healthy diverse sagebrush community lies in the proper balance of grazing pressure between grasses, forbs, and shrub vegetation components by season, and the ability to allow adequate recovery periods.

In the past, grazing in burned areas was not managed to promote the recovery of sagebrush with the appropriate herbaceous understory and has negatively impacted sage-grouse and sagebrush obligate species. Cumulative effects of livestock grazing would occur if future burned areas are not allowed an adequate period of rest and if grazing is not properly managed.

Livestock trailing along roads and complying with the stipulations for trailing would cause few impacts through burned areas, and would not lead to cumulative effects.

Gateway West Transmission Lines – Even though use of the project area by sage-grouse is low, the establishment of more transmission lines through the project area further degrades conditions for sage-grouse and reduces the potential of the area ever providing quality habitat in the future. It is apparent from the scientific evidence that past and present energy development degrades habitat and is impacting sage-grouse populations (Naugle et al. 2011). Building the Gateway West transmission lines would lead to cumulative effects in conjunction with a large wildfire by further reducing the amount of suitable habitat in and near the project area.

Noxious Weed Treatment – Treatments would reduce the spread of noxious weeds that would compete with desirable vegetation trying to re-establish following fire. Noxious weed treatments would benefit the recovery of burned areas. There would be no cumulative negative impact from treatment of noxious weeds in burned areas across the analysis area.

Recreation – Activity associated with recreation would decrease in burned areas adjacent to roads. Furthermore, areas burned by recent fires adjacent to the project area and within the cumulative effects analysis area have led to motorized travel restrictions, reducing the impacts to the ground and the level of disturbance to wildlife. There would not be cumulative effects from fires and recreational activities.

Raptors: Golden Eagle and Ferruginous Hawk –

The scope of analysis for golden eagle for this alternative includes the project area and the area within 21 mi^2 of the project area. This analysis area was determined based on the biggest average territories documented in southwestern Idaho (Kochert et al. 2002).

Livestock Grazing and Trailing – Sagebrush habitat provides necessary cover for jackrabbits and is the preferred habitat of Piute ground squirrels. Depending on the level of grazing, effects from the reduction of cover and forage from grazing have varied across the landscape. Impacts to golden eagles and ferruginous hawk from fire vary depending on the size and intensity. Loss of large tracts of suitable prey species habitat leads to reduced production and can lead to extirpation of these

raptors from a burned area. These impacts occur at the local and population scale for ferruginous hawks. Based on the analysis of grazing in the sage-grouse section above; grazing a burned area without adequate rest and proper management would slow the recovery of suitable habitat for jackrabbits and other prey items. This would have negative cumulative effects to ferruginous hawks. If a burned area is given adequate rest and grazing is properly managed, cumulative impacts could be avoided.

Trailing along roads would have less likelihood of cumulative impacts due to the consolidated area impacted and because raptors are highly mobile.

Gateway West Transmission Lines – Habitat loss for prey species from the construction of the proposed transmission line would likely be minimal. There would be risk of collision and electrocution and the effects would be cumulative to the effects of wildfire leading to the loss of sagebrush habitat. The transmission lines could also provide some benefits such as potential nest sites and perch sites for hunting.

Noxious Weed Treatment – Treatments would augment the re-establishment of desirable vegetation post fire, and no negative cumulative impacts would result.

Recreation – There would be no cumulative impacts from recreation and impacts from wildfire. Burned areas are less attractive to recreationalists, especially in areas adjacent to roads.

Mule Deer –

Livestock Grazing and Trailing – See: Sage-grouse.

Gateway West Transmission Lines – Habitat loss for mule deer from the construction of the proposed transmission line would likely be minimal and cumulative effects would not occur.

Noxious Weed Treatment – See: Sage-grouse.

Recreation – See: Sage-grouse.

Piute Ground Squirrel –

Livestock Grazing and Trailing – See: Sage-grouse.

Gateway West Transmission Lines – Construction of transmission lines would cause minimal loss of sagebrush habitat. Towers could provide perch sites for predators which could reduce squirrel numbers. However, the loss of sagebrush from fire near transmission lines could lead to cumulative impacts by reducing reproductive success and increasing vulnerability to predation.

Noxious Weed Treatment – See: Sage-grouse.

Recreation – Recreation in areas impacted by wildfire and adjacent to roads would not be at levels causing cumulative impacts.

Brewer's Sparrow –

Livestock Grazing and Trailing – See: Sage-grouse.

Gateway West Transmission Lines – See: Sage-grouse.

Noxious Weed Treatment – See: Sage-grouse.

Recreation – See: Sage-grouse.

Longnose Snake –

Livestock Grazing and Trailing – See: Sage-grouse.

Gateway West Transmission Lines – Construction of transmission lines would cause minimal loss of habitat. However, the loss of sagebrush from fire near transmission lines could lead to cumulative impacts by decreasing prey populations, reducing reproductive success, and increasing vulnerability to predation.

Noxious Weed Treatment – See: Sage-grouse.

Recreation – See: Sage-grouse.

Western Toad –

Livestock Grazing and Trailing – See: Sage-grouse.

Gateway West Transmission Lines – No cumulative effects because there would be minimal habitat loss from transmission line construction.

Noxious Weed Treatment – See: Sage-grouse.

Recreation – See: Sage-grouse.

3.3.3.2 Alternative 2-6

In addition to the proposed action, the NRCS would be encouraging private land owners to develop fuel breaks connecting to the fuel breaks developed on BLM, State, and Bureau of Reclamation managed lands. The effects from the development of fuel breaks on private land within the project area are analyzed in this section.

Greater Sage-grouse and Brewer's Sparrow–

The environmental analysis of the action alternatives determined effects to sage-grouse and Brewer's sparrow would be negligible and potential benefits of fuel break development outweighed the low level of risk for negative impacts. The reasons there would not be measurable effects to these species from any alternative include the following:

- There would be relatively few acres of sagebrush habitat loss from implementation of any action alternative.

- Treatments are adjacent to roads;
- Actions include design features protecting habitat and important life history activities for these species.
- Use of the project area by sage-grouse is low and will likely remain so due to the high level of human disturbance and development and due to habitat degradation from wildfire and invasive annual plants across thousands of acres in the project area.

Therefore, the likelihood of cumulative effects from project implementation with current and foreseeable projects would be minimal.

Fuel Breaks – If all land owners participated in fuel break development in conjunction with the proposed action, an estimated 133 miles of routes or 213 miles of fuel breaks would be developed on private land. For the same reasons identified in the environmental consequences section, the effects of fuel breaks developed on private lands would be the same as those proposed by BLM. The potential benefits of the BLM proposed fuel breaks and of the potential fuel breaks developed on private lands outweigh potential risks of continued habitat loss. There would be no negative cumulative effects from fuel breaks on private lands.

Golden Eagle, Ferruginous Hawk, Mule Deer, Piute Ground Squirrel, Longnose Snake, Western Toad –

The environmental analysis of the action alternatives determined effects to these species would be negligible and potential benefits of fuel break development outweighed the low level of risk for negative impacts. Therefore, the likelihood of cumulative effects from project implementation with current and foreseeable projects would be minimal.

3.4 Cultural Resources

3.4.1 Affected Environment

The project area is within approximately 277,766 acres of lands north of the Snake River to the base of the Danskin and Mount Bennett foothills and is part of the Western Snake River Plain. Much of the southern project area is flat or gently rolling with incised drainage cuts. The project areas closest to the foothills have more pronounced drainage cuts with steeper slopes and more varied terrain. The Snake River corridor and its plain served as a travel corridor for both prehistoric and historic groups.

The project area is within the northern Great Basin Cultural region and research has shown that these hunter-gatherer groups used the area for at least the past 12,000 years (Plew 2008). The project area provided important plant and animal resources to members of the Northern Paiute, Northern Shoshone, Bannock and Eastern Shoshone Tribes and their ancestors. However, based on current data, it appears the main areas of prehistoric use were just outside the project area to the south along the Snake River and to the east in the area of Hog and Dry Creeks. Camus Prairie to the northeast was also an important area providing camus root (*Camassia quamash*) in the summer (Plew 2008). Groups traveled between the Snake River and Camus Prairie for seasonal rounds, in all probability passing through the project area. Based on cultural resource surveys completed within the project area to date, the majority of prehistoric sites are within the southeastern project area located between Camus Prairie and the Snake River, but also where water appears to be more prevalent. The most

dominant site type recorded across the project area is the lithic scatter which is found in roughly 87% of the prehistoric sites. Other site types include rock art, constructed rock features, rockshelters, earthen depressions and burials. The site types found suggest that the project area was mainly used for short term hunting camps but some limited longer term use and ceremonial practices also occurred.

Explorers and fur trappers began sporadic forays through southwestern Idaho in the early 1800s following trails created by Native Americans, some of which would become the Oregon Trail. 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 alternate trails passed through the current project area.

Limited settlement had occurred in Idaho up to this point and it wasn't until gold was discovered in the Boise Basin in 1862 that settlement of the Idaho area began in earnest (Hutchison and Jones, Editors 1993). This settlement encouraged ranching, irrigated farming and other supply services to support the gold mines. As the population increased so did the infrastructure of the area. The Oregon Shortline Railroad, which passes through the project area, was constructed in 1884 connecting Wyoming with Oregon. Small communities and ranches developed along the rail line and in the general region. Additional roads were constructed connecting these communities and the ranches. In 1925 Highway 30 was constructed to support motorized vehicles. These railroads and roads changed the economic viability of the region.

In the project area ranching and farming were the predominant activities but it wasn't without its challenges due to the limited water supply. Irrigation systems were constructed as early as the 1860s and continued to expand and improve in scope and size. In 1894 the Carey Act was passed which encouraged land "reclamation by giving each western state a million acres of land if it found a way to irrigate them" (Schwantes 1991). A number of ditches and reservoirs were constructed to support farming and ranching in the project area.

Previous archaeological investigations in the project area have resulted in the recordation of historic debris scatters which make up the majority of sites (~56%); stone features that include rock walls and cairns; irrigation related features such as ditches, dams and reservoirs; structures and/or structural foundations associated with habitation; railroad grades and associated features; and historic travel corridors that include segments of the Oregon Trail and various other miscellaneous roads throughout the area.

Recent archaeological surveys, totaling 20,711 acres, within the area of potential effect of the proposed project resulted in 136 new sites recorded and 23 previously recorded sites revisited. Sites included small roadside dumps, habitation sites, railroad spurs, historic roads, water conveyance systems, an historic livestock watering pond, lithic scatters and isolated finds. Of the sites recorded 16% of the sites were determined eligible for listing on the NRHP or were left unevaluated pending further research. The majority of sites that were determined ineligible were simple roadside dumps that do not meet the NRHP criteria for eligibility.

3.4.2 Environmental Consequences

Fuel break Tools

The use of fuel break treatment tools will be considered on a site by site basis in consultation with the Idaho State Historic Preservation Office. All tools may require more than one treatment or be done on a continuous basis every year or as needed. More than one treatment type may be used to achieve the desired fuel break effect. Examples include mowing sagebrush then applying an herbicide to reduce invasive weeds in the interspaces. Not all tools are appropriate for all sites when considering site type, vegetation and soil conditions. One treatment type, disking, is not approved within any archeological site due to the potential for significant soil disturbance that could adversely affect a site's National Register of Historic Places qualities. Other individual treatment options are discussed below. In some cases it may be prudent to monitor the effects of a treatment type implemented in an area where there are no cultural resource concerns prior to using that treatment option within an archeological site. In some instances a treatment type may need to be done more than once in the same area. An example would be drill seeding an area two years in a row in order to get the desired plant growth. Although one drill seed pass through a site may be acceptable, repeated passes may increase the displacement of artifacts and increase the amount of soil disturbance. Only one study has been completed concerning the effects of drill seeding on an archeological site and that study was rebutted (Bryan et al. 2011, Rust & Earl 2011).

Disking

Due to the heavy ground disturbing nature of this proposed tool for fuel break construction, there will be no disking allowed in any National Register listed, eligible or unevaluated site within the project's APE. Disking will also not be allowed within the half-mile buffer (1/4 mile each side) surrounding the Oregon National Historic Trail. Disking through a site will 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 will also be heavily impacted by disking through flattening of feature berms, such as those along the Oregon Trail and in general minimizing a linear site's features.

Mechanical Thinning and Mowing

Thinning of thick sagebrush within an archeological site can be beneficial to a site by reducing thick vegetation, thus reducing the fire's intensity and any potential adverse impacts to artifacts and features from the fire and fire suppression activities. Mechanical thinning of sagebrush, using chainsaws, within archeological sites is an acceptable option to reduce combustible vegetation. Thinning may be done using chainsaws, however, no thinned vegetation will be piled within the boundaries of any defined NRHP listed, eligible or unevaluated site and no pile burning will occur within an archeological site. Thinning along the Oregon National Historic Trail will be completed in a way that creates vegetative mosaics. Vegetative thinning may occur on an as needed basis throughout the life of the project.

Mowing vegetation to a height of no less than 6" is also an acceptable option for vegetation treatment provided there are no features taller than 6" or artifacts that are above the 6" height. If mowing along the Oregon National Historic Trail is proposed then mowing will be conducted parallel to the trail and not within the trail corridors. In no instance should the mower

perpendicularly cross the trail. Mowing may occur on an as needed basis throughout the life of the project.

Mechanical treatments may be followed with herbicide treatments to reduce invasive plant species growing in the interspaces. The use of either mechanical treatment method within an archeological site will be determined on a site by site basis in consultation with the Idaho SHPO. In areas where a strong sagebrush component is visible then the sagebrush component will be retained for visual integrity, although thinned to a 5-10% canopy cover, to create a fuel break.

Herbicide

The application of herbicides within an archeological site is an acceptable method to reduce vegetation provided that the chemicals are applied either with a truck from an existing road or with an ATV/UTV mounted sprayer or hand sprayer cross country and the use of those herbicides do not leave a site bare of vegetation that would increase erosion. The use of herbicides will be followed by seeding which will also be applied by ATV/UTV mounted seeder or by hand. ATV/UTVs will not be used within an archeological site when soils are saturated. The use of herbicides and method of application will be determined on a site by site basis in consultation with the Idaho SHPO.

Targeted Grazing

Most, if not all, of the archeological sites have been grazed in the past or are currently being grazed by cattle. However, grazing in these areas has normally not been as concentrated as what would occur with targeted grazing, where many animals are fenced into a relatively small area for an unspecified duration of time. It is known that adverse impacts can occur to cultural resources from livestock grazing when livestock are concentrated in one area. Direct impacts "include trampling, chiseling, churning of site soils, cultural features, and cultural artifacts, artifact breakage, and impacts from standing, leaning, and rubbing against historic structures, above-ground features, and rock art. Indirect impacts include soil erosion, gullying, and increased potential for unlawful collection and vandalism. Continued grazing may cause substantial ground disturbance and cause cumulative, long term, irreversible adverse effects to historic properties" (USDI BLM Colorado State Office IM #CO-2002-029). Site's within an area where targeted grazing has been identified as the preferred treatment type will be fenced from livestock entering the site. There will be no targeted grazing on the Oregon National Historic Trail.

Targeted grazing may be an acceptable tool under certain conditions and with certain animals. Targeted grazing may be acceptable in areas that have been previously heavily grazed or in areas that are relatively rocky where soil disturbance would be limited and when soils are dry, not wet. In some instances concentrated targeted grazing may be an acceptable treatment to use outside the boundaries of a site in order to reduce vegetation around the site. The site would be fenced off but perhaps a few animals would be allowed within the fenced area to remove vegetation without the effects of severe concentrated trampling. In all cases the use of large cattle in a concentrated area where an archeological site is located will not be permitted. The use of sheep will also not be allowed since sheep pull plants out by the roots, thus potentially creating issues with erosion. The use of goats may be more practical, provided there is no bedding down within sites, the goats are moved through the archeological site quicker than through non-site areas, and no water troughs are placed on the site. Temporary fencing to corral livestock will be installed in such a way that archeological sites are not impacted. The use of targeted grazing will be determined on a site by site basis in consultation with the Idaho SHPO.

Prescribed Fire

The use of prescribed fire to reduce vegetation is an acceptable treatment under certain conditions. Many of the archeological sites in the project area have been previously burned under severe wildfire conditions and any combustible materials that were present have since been consumed, however, other non-combustible materials that reflect a site's importance remain. Previously burned sites are easily identified since they have lost their original sagebrush component and are currently covered in various grass types, many of which are considered invasive annual plants. The use of prescribed fire also includes using Class A foam or disking a line to contain the fire within the 300' treatment area. Disking will not be allowed through any site. If prescribed burning is proposed near a site then the disker will stay outside the site's boundaries as defined by the BLM archeologist. The use of foam may be acceptable dependent upon the site type within the APE for this treatment. The application of foam will be from a vehicle mounted sprayer. If the vehicle must pass through an archeological site, a UTV may be used. If a heavier vehicle, such as a truck or fire engine, is the only available mechanism for transportation, it must pass outside the site's boundary to spray the foam. In most cases prescribed fire will have little to no adverse effect on any site if allowed to burn across the site. Post burn seeding will be conducted by either hand seeding, ATV mounted seeder or minimum till drill or standard rangeland drill with depth bands. Seeder type will be dependent upon the site type and whether the site has been previously drill seeded. The use of prescribed fire and post fire seeding will be determined on a site by site basis in consultation with the Idaho SHPO.

Seedings (Rangeland Drill)

The use of a rangeland drill within an archeological site will be determined on a site by site basis depending upon the resources present, soil conditions and rangeland drill type being proposed. A standard rangeland drill with no depth bands can disturb up to 6" of soil and will not be allowed to pass through any archeological site. A minimum-till drill or a standard rangeland drill with depth bands may affect approximately 1" (3cm) of soil, dependent upon soil type, resulting in significantly less soil disturbance. The tines on the drill are typically spaced 16" apart leaving a significant amount of soils intact. There is, however, a lack of published data detailing the effects to archeological sites. Therefore prior to determining whether a site will be drill seeded, other drill seeded areas within the project area will be monitored post seeding to document the effects of that treatment and decide if it would be an appropriate treatment within an archeological site. If a site is determined to be a candidate for drill seeding, seeding must not be done when the soil is wet and drills will not be allowed to turn around in a site. If drill seeding is determined to be an appropriate treatment along segments of the Oregon National Historic Trail then a minimum-till drill or rangeland drill with depth bands will be used and they will stay 100' away from the trail and be used parallel with the trail. In no instances will any drill cross the trail perpendicularly.

Since drill seeding may be required more than once in the same area to get the desired seeds established there could be cumulative effects in archeological sites from the additional drilling activities. Sites may be seeded once but additional seedings will require further assessment to determine if the archeological site should be included or avoided in the reseeding. In certain archeological sites with loose soils seed will be dispersed using UTV/ATV mounted seeders or by hand. Simply avoiding a site can result in growth of different vegetation types that make the archeological site stand out. This can result in indirect impacts to the site through identifying the site as a special area that attracts people who collect artifacts. An attempt should be made to not allow "islands" of vegetation that identify site locations.

Prostrate Kochia

The seeding of non-native prostrate kochia within archeological sites is acceptable provided the seed is dispersed according to the above mentioned seeding methods. Many of the archaeological sites that have burned over in the past are currently covered in non-native invasive annual plants, such as cheat grass, which has increased the fire return interval. Prostrate kochia's growth characteristics have the ability to reduce the spread of wildfire; decreasing the number of times fire burns through an area and thus decreasing the potential for adverse effects to occur to sites through wildfire suppression.

Native vegetation is preferable along the Oregon Trail but the use of prostrate kochia is permissible affording the OR Trail more protection if fire slows down in areas where it is planted along the trail. Prostrate kochia seeds will be dispersed according to the above mentioned seeding methods.

3.4.2.1 Alternative 1 – No Action

Under the No Action alternative there will be no effects from the proposed project, however, large scale wildfires will continue to pose a threat to combustible cultural resources from high heat, and all eligible, unevaluated and as yet unidentified cultural resources will be threatened by wildfire suppression activities, such as the construction of bulldozer lines.

3.4.2.2 Alternative 2 – All Routes (Proposed Action)

Under this alternative, sites listed on the National Register of Historic Places (NRHP), sites eligible for listing on the NRHP, and unevaluated cultural resource sites that will require either avoidance or mitigation are contained by 2,256 acres within the area of potential effect. The majority of these acres enclose approximately 12.3 miles of discontinuous segments of Oregon National Historic Trail and the required half-mile buffer which requires special consideration as directed under the Oregon Trail Management Plan. Additional surveys to identify braided segments of the Oregon Trail will be needed; however, even though additional segments might be recorded it will not change the number of acres requiring avoidance or mitigation under this alternative. Additional site acreage includes 6.6 miles of other linear features or newly recorded segments of the Oregon National Historic Trail and 15 other eligible or unevaluated site types scattered within the APE.

Within the 2,256 acres, fuel break construction tools will be limited based on site type and location. In all cases no heavy ground disturbing activities such as disking will be allowed within any site or within the Oregon National Historic Trail corridor. Other tools will be decided on a site by site basis and will include complete avoidance of a site to activities that have minimal ground disturbance, such as minimum till drill, targeted grazing in rocky areas, herbicide and seeding applications that utilize all-terrain vehicles and prescribed burning, that will not affect the site's National Register qualities. Acceptable treatment types within archeological sites will be determined in consultation with the Idaho SHPO.

3.4.2.3 Alternative 3 – All Routes Except Mayfield RD

Under this alternative, known sites listed on the NRHP, sites eligible for listing on the NRHP, and unevaluated cultural resource sites that will require either avoidance or mitigation are contained by 645 acres within the area of potential effect. Additional surveys to identify braided segments of the Oregon Trail will be needed under this alternative; however, even though additional segments might

be recorded it will not change the number of acres requiring avoidance or mitigation under this alternative. Within this alternative, previous surveys along the powerline corridor do not meet the width requirement for the 400' survey area on each side for fuel breaks therefore additional surveys along the powerline will be conducted if this alternative is chosen. Additional surveys in which previously unknown sites are recorded may increase the number of acres requiring either mitigation or avoidance. The 645 acres encompass at least 2.75 miles of Oregon National Historic Trail, 4.7 miles of other linear features as well as some short newly recorded segments of National Oregon Historic Trail, and nine additional individual archaeological sites that cover 11.3 acres.

The types of fuel break construction tools that will be acceptable under this alternative are similar to those mentioned under Alternative 2.

3.4.2.4 Alternative 4 – Reduced Routes

Under this alternative sites listed on the NRHP, sites eligible for listing on the NRHP, and unevaluated cultural resource sites that will require either avoidance or mitigation comprise 2,043 acres within the area of potential effect. The majority of these acres contain approximately 10 miles of the Oregon National Historic Trail and the required half-mile buffer which requires special consideration as directed under the Oregon Trail Management Plan. Additional surveys to identify braided segments of the Oregon Trail will be needed under this alternative; however, even though additional segments might be recorded it will not change the number of acres requiring avoidance or mitigation under this alternative. In addition to the Oregon Trail the 2,043 acres comprises 2.7 miles of other linear site type and 13 individual archeological sites covering 12.8 acres.

The types of fuel break construction tools that will be acceptable under this alternative are similar to those mentioned under Alternative 2.

3.4.2.5 Alternative 5 – Reduced Routes Except Mayfield RD

Under this alternative known sites listed on the NRHP, sites eligible for listing on the NRHP, and unevaluated cultural resource sites that will require either avoidance or mitigation comprise 624 acres within the area of potential effect. Additional surveys to identify braided segments of the Oregon Trail will be needed under this alternative; however, even though additional segments might be recorded it will not change the number of acres requiring avoidance or mitigation under this alternative. Within this alternative, previous surveys along the powerline corridor do not meet the width requirement for the 400' survey area on each side for fuel breaks and additional surveys along the powerline will be conducted if this alternative is chosen. Additional surveys in which previously unknown sites are recorded may increase the number of acres requiring either mitigation or avoidance. Within the 624 acres there are approximately 2 miles of Oregon National Historic Trail and the required half-mile buffer, one additional mile of other linear site type and seven individual archeological sites that cover 9.2 acres.

The types of fuel break construction tools that will be acceptable under this alternative are similar to those mentioned under Alternative 2.

3.4.2.6 Alternative 6 – High Human Ignition Areas

Under this alternative sites listed on the National Register of Historic Places (NRHP), sites eligible for listing on the NRHP, and unevaluated cultural resource sites that will require either avoidance or mitigation comprise 72 acres within the area of potential effect. Although portions of the 72 acres contain the half-mile buffer for the Oregon Trail there are no physical segments of the Oregon Trail on BLM, BOR or State lands in this alternative. Other site types include 4.3 miles of linear sites and four individual sites that cover 7.1 acres.

The types of fuel break construction tools that will be acceptable under this alternative are similar to those mentioned under Alternative 2.

Table 3.10 - Number of Acres of Site & Oregon Trail Requiring Mitigation By Alternative

	Acres Requiring Mitigation	Oregon Trail Miles
Alternative 2	2256	12.3
Alternative 3	645	2.75
Alternative 4	2043	10
Alternative 5	624	2
Alternative 6	72	0

3.4.3 Cumulative Effects

The spatial boundary defined for cumulative effects for cultural resources is the entire project area. The temporal scope will be the life of the project as described in Chapter 2.

This proposed project may be implemented on private property if the land owner applies for federal funding through the NRCS. In that situation any identified cultural resources will addressed through the Section 106 process. In the case of the OR Trail, the NRCS will apply conditions set forth in the BLM's OR Trail Management Plan that the landowner must follow until the fuel break project has been completed. As well, the private land owner may initiate fuel break construction on their own property without federal funding. There are no restrictions for private landowners concerning preservation of the Oregon Trail, thus if a property owner wishes to impact a section of trail on their property it will result in an increase in the fragmentation of the Oregon National Historic Trail.

Gateway West Transmission Line

Because the Gateway West Transmission Line Project is still in progress, and no decisions have been made on the final route, two proposed routes are being analyzed within the current project. The BLM preferred alternative to the Gateway West Transmission Line Project will pass over three segments of Oregon National Historic Trail in the project area; two segments on BLM managed land and one segment on private land. Gateway West's preferred alternative will cross the Oregon National Historic Trail twice, once on BLM lands and once on Private lands. Currently no decisions have been made as to how adverse effects to the Oregon Trail or any other archeological site will be mitigated from direct or indirect impacts from construction of the transmission line. According to the Gateway West FEIS the project's design would introduce new elements that are of a different form and texture from the existing powerlines and may draw the attention of the casual observer,

therefore there would be an adverse effect to the trail from construction of this transmission line where it is seen from the Oregon Trail. Additionally it is unknown where towers and access roads will be constructed. These may also have adverse effects on the Oregon Trail and other archeological sites.

In addition to the proposed transmission line, the establishment of Gateway West's transmission line corridor may lead to construction of other lines being installed in that same corridor in the future. An increase in the number of transmission lines in the corridor could have visual impacts on the visual setting of some cultural resources as well as direct effects from tower and access road construction.

Proposed Wind Energy Facilities

Four future proposed wind energy developments on private property are within the project area. Potential indirect impacts to the Oregon Historic National Trail would be in the form of visual impacts from the wind towers that are of a design that is different from any existing structures in the area and may draw the attention of the casual observer.

Mayfield Community Development

Direct impacts to the OR National Historic Trail may include complete destruction of the trail on private property, thereby further segmenting the trail. Indirect impacts to the trail may include visual impacts from constructed buildings, increased usage ATVs along segments of trail not open to motorized use on public lands which may increase erosion and destroy trail features, and the potential for unauthorized collection of artifacts from increased foot travelers.

3.4.3.1 Alternative 2

- If this project is implemented on private lands within the APE then a minimum of 2000 acres of private land will require either avoidance or mitigation of NRHP sites. The 2000 acres calculated within the APE is strictly for acres that contain the OR Trail and its associated half-mile buffer.

3.4.3.2 Alternative 3

If this project is implemented on private lands within the APE then a minimum of 445 acres of private land will require either avoidance or mitigation of NRHP sites. The 445 acres calculated within the APE is strictly for acres that contain the OR Trail and its associated half-mile buffer.

3.4.3.3 Alternative 4

If this project is implemented on private lands within the APE then a minimum of 1736 acres of private land will require either avoidance or mitigation of NRHP sites. The 1736 acres calculated within the APE is strictly for acres that contain the OR Trail and its associated half-mile buffer.

3.4.3.4 Alternative 5

If this project is implemented on private lands within the APE then a minimum of 240 acres of private land will require either avoidance or mitigation of NRHP sites. The 240 acres calculated within the APE is strictly for acres that contain the OR Trail and its associated half-mile buffer.

3.4.3.5 Alternative 6

If this project is implemented on private lands within the APE then a minimum of 208 acres of private land will require either avoidance or mitigation of NRHP sites. The 208 acres calculated within the APE is strictly for acres that contain the OR Trail and its associated half-mile buffer.

3.5 Visual Resource Management

Western landscapes are a legacy to pass on to future generations. The BLM manages diverse lands with inherent scenic value; each with a unique sense of place. Multiple uses on BLM lands have the potential to create visual impacts as the demand grows for various land uses. The visual character of the BLM landscape is managed using the Visual Resource Management (VRM) system. This system helps identify visual (scenic) values, minimize the visual impact to landscape character, and lend objectivity to the process.

3.5.1 Affected Environment

Visually, the project area is a mix of three types of landscapes; the Snake River Plain, the transitional zone between the Snake River Plain and the Danskin/Bennett Mountains, and the canyon rim areas along the Snake River.

The Snake River Plain is a large, expansive plateau with scattered, small volcanic rock outcrops and small volcanic buttes. This is an open, expansive landscape covered with a variety of low vegetation. Adjacent views to the north are of the Boise, Danskin, and Bennett Mountains. The form of the landscape is flat with scattered small hills, several prominent buttes, and blocky rock outcrops. The landscape lines are long and horizontal with a few diagonal lines associated with buttes. The color is predominantly various hues of brown. The texture is generally smooth with scattered bumps. The vegetation consists of grasses and shrubs that produce straight lines and irregular curves. Vegetation color varies by season but is primarily light tan, olive, sage, and grey. The texture is mostly smooth grasses and scratchy, bristly shrubs. Man-made structures in the area include power-lines, scattered buildings, four-lane divided highway, two lane paved and gravel roads, and railroad tracks. These structures produce long, straight, horizontal lines that tend to follow the natural landscape lines. This horizontal pattern is disrupted by the vertical lines of power poles, cell phone, power, and wind turbine towers. Structures tend to be grey and other dark metallic hues. The notable exceptions are the white wind turbines.

The foothills areas create a transitional zone between the relatively flat form of the Snake River Plain and the rugged, angular mountains to the north. The landscape is characterized by low, rolling hills with shallow, narrow drainages fingering downslope. The vegetation consists of open areas of tan grasses with large, thick stands of sage/olive colored sagebrush and scattered areas of isolated shrubs. The texture is generally smooth with bumpy, rough areas associated with shrubs and rock outcrops and spikey trees in some areas. There are long expansive views dotted with isolated houses and other man-made structures such as power lines and roads. Middle and background views to the north are of the Boise, Danskin, and Bennett Mountains. Views to the south are across the vast Snake River Plain and the distant Owyhee Mountains.

The southern end of the project area includes portions of the rim rock areas along the Snake River. This area is characterized by large, open basins that slope up to vertical cliffs ending with long, horizontal, often narrow, rim rock. The area is a rural landscape with scattered agricultural and residential structures. Vegetation includes a wide variety of species from grasses and low shrubs to tall shrubs and trees along drainage bottoms. Natural colors vary from tans, browns, and various shades of green of the vegetation and land to the silver, grey blue water of the Snake River and other streams. Man-made structures in the area are similar to the other two landscapes. There is the long linear pattern of Interstate 84 and the railroad winding through the slopes and along the Snake River.

There are scattered residential and commercial buildings of the communities of Hammett and Glenn's Ferry. Long horizontal power lines follow major and minor roads.

The project area includes portions of land covered by three land use plans; Kuna Management Framework Plan (MFP), Jarbidge Resource Management Plan (RMP), and the Snake River Birds of Prey National Conservation Area RMP. Each of these management plans designated VRM Classes for the planning area. The project area includes VRM Classes I, III, and IV (Map 13). The management objectives for each VRM Class are listed below.

- **Class I Objective**. 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.
- **Class III Objective**. 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.
- **Class IV Objectives**. 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.

About 22,717 acres, which represents about 14 percent of the project area, is classified as VRM Class I. This is the most protective VRM Class. These areas are associated with the Oregon National Historic Trail and are located along the northeast project boundary. This VRM Class I area is an automatic designation because of the National Historic Trail designation even though the characteristic landscape is not a completely natural looking view. There are many made-made intrusions that exist in the area. Examples include paved and gravel roads, multiple power lines, wind turbines, and a portion of Interstate 84. However, the visual management objective in Class I areas is to preserve the existing character of the landscape, and the level of change to the characteristic landscape should be very low and must not attract attention.

The large majority of the project area (75 percent) is VRM Class III, where the general objective is also to partially retain the existing character of the landscape, and any changes to the characteristic landscape should be moderate. The Class III area appears as a wide buffer along the Interstate 84 corridor.

The remainder of the project area (11 percent) is classified as Class IV. This classification allows for major modifications to the landscape that attracts attention. However, managers should make every effort to minimize the visual impact through design elements. The Class IV area is located in the southeast portion of the project area.

3.5.2 Environmental Consequences

Environmental consequences to visual resources are focused on the effect to the characteristic landscape when viewed and evaluated by the casual observer. In other words, does the project stand out against the landscape to most people and what effect does this have? To evaluate the visual impact, a visual contrast rating analysis was conducted to determine the visual effects the proposed action and alternatives would cause and whether or not the VRM objectives for the area would be met. The two Key Observation Points (KOPs) used to conduct the analysis are located along the Hammett Hill Road (just south of Old Oregon Trail Road) and Bennett Mountain Road (at the Oregon Trail crossing). These KOPs were selected because they are located where the project would be visible to the casual observer and are representative of the project area.

The project area, away from Interstate 84, is used primarily by ranchers, area residents, recreationists, and Oregon Trail enthusiasts. Effects to visual resources are only analyzed for BLM or Bureau of Reclamation administered lands and not on state lands. For this reason, the number of miles affected may differ slightly from those referenced in other sections of this document.

3.5.2.1 Alternative 1

There would be no development of fuel breaks within the project area increasing the likelihood of adverse impacts to visual resources from large-scale wildfire. In the long-term there would be a need for more ground disturbing fire suppression activities resulting in line and color contrasts and scars from fire suppression methods. Long-term impacts to vegetation from wildfire through partial or complete consumption and the replacement of native vegetation with invasive annual plants, reduces the integrity of visual resources in the project area.

3.5.2.2 Alternative 2

The proposed action would create fuel breaks along 131 miles within VRM Class III and IV areas and 34 miles within Class I areas. Of the 34 miles of Class I areas about 16 miles contain intact stands of sagebrush adjacent to routes.

Constructing 165 miles of fuel breaks along existing roads and power lines would cause either no contrast to a weak contrast to the form of the land through leveling and other ground disturbing methods over most of the project area. It would cause weak line contrast through the creation of a linear buffer along existing linear man-made features. Exposing soil would create a weak to strong contrast to the color of the landscape depending on the exact location. The texture of the exposed soil would add smoothness to the landscape, thus creating a weak to moderate contrast.

Construction of fuel breaks would cause a weak to moderate contrast to the form of the vegetation depending on the treatment type. Establishment of vegetated fuel breaks in areas of existing sagebrush would cause a weak to moderate amount of contrast due to introduction of the distinct lines in the landscape. The lighter color of new vegetation following construction of the project would create moderate to weak contrast with the existing vegetation.

The most visually sensitive areas are the existing sagebrush stands in VRM Class I areas associated with the Oregon Trail. Hand thinning would have a moderate to weak impact to the vegetation texture within the first 25 feet of the road but would taper to no contrast over 100 feet. Previously burned areas would not exhibit as much contrast as unburned areas in the form, color, and texture of vegetation due to differences in the attributes of grass verses sagebrush. The existing condition at

KOP 2 (Bennett Mountain Road at the Oregon Trail crossing) and a visual simulation of a 100 ft. thinning fuel break is shown in Figure 1 and Figure 2.

Figure 1 - Existing view from Bennett Mountain Road

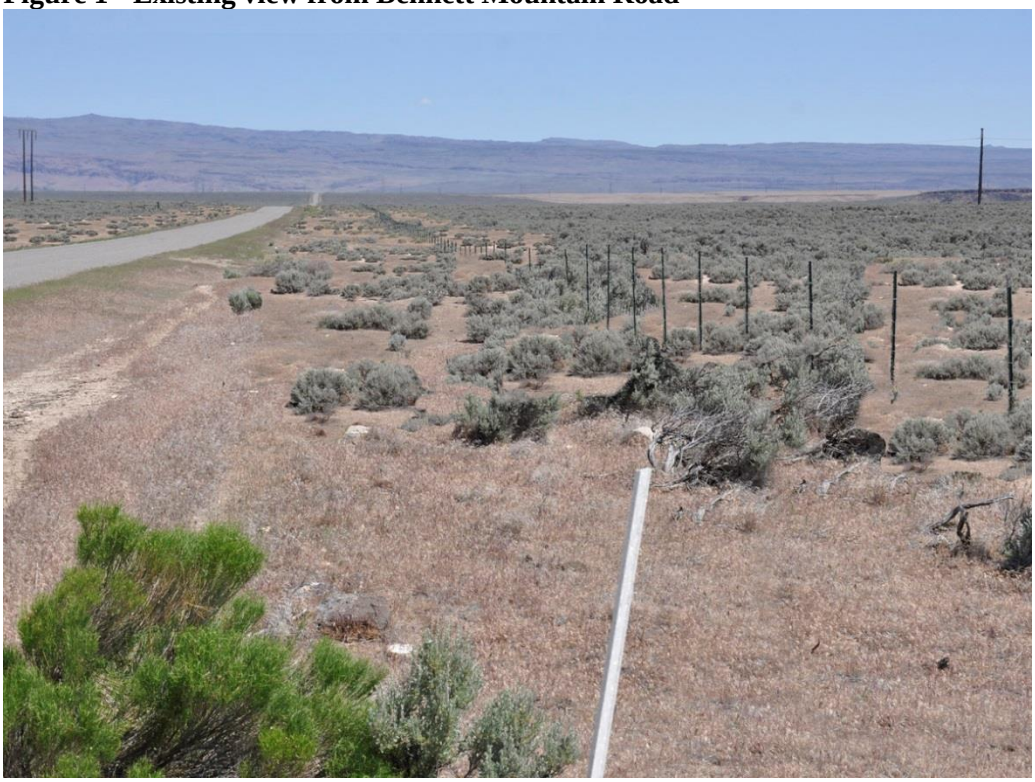


Figure 2 - Visual Simulation of hand thinning sagebrush fuel break

Figure 3 - Visual Simulation of prostrate kochia fuel break

The level of change to the characteristic landscape would be low to moderate based on the addition of vegetative or bare soil fuel breaks which create color, line, and texture contrasts with the landform and vegetation. The project is proposed across VRM Class I, III, and IV. The majority of the project (131 miles) is through VRM Class III and IV areas where the level of change can be moderate to high and activities may attract attention but should not dominate (Class III) or may dominate the view (Class IV) of the casual observer. The proposed action would meet the visual objectives for a majority of the project area.

The remaining 34 miles of the project area crosses VRM Class I areas where the objective 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. A little more than half of the existing VRM Class I area has been affected by past wildfire events. There are about 16 miles of thick sagebrush stands. Some sagebrush stands that have partially burned have a very open canopy. Hand thinning the sagebrush to create an open canopy that tapers to a higher density will not likely attract the attention of the casual observer. The Class I areas are all associated with the Oregon National Historic Trail. Throughout the VRM I area, there are existing man-made, visual intrusions (e.g. paved & gravel roads, wind turbines, and power lines) that were introduced prior to BLM current VRM direction or are on private lands. The proposed action is a preventative measure to minimize major changes to the visual character of the landscape from large wildfires, which, historically, are primarily human caused. Although the mitigation methods to minimize contrasts to the form, line, color and texture may be noticeable to a few attentive viewers, the proposed action would not draw attention for a majority of casual observers and would meet management objectives.

3.5.2.3 Alternative 3

The visual impacts associated with construction of 157 miles of fuel breaks as proposed in Alternative 3 would be the same as Alternative 2 but on different numbers of miles. The 140 miles of fuel breaks in VRM Class III and IV would have the same effect as described in Alternative 2. The activities would meet the visual objectives for a majority of the project area. The 17 miles of fuel breaks in VRM Class I areas is about half as many as Alternative 2 although the number of treatment miles in sagebrush stands would be just slightly less. The impacts to Class I areas would be the same as described in Alternative 2. The mitigation methods used to minimize contrasts would likely no draw attention to a majority of casual observers and would meet the visual objectives for the areas.

3.5.2.4 Alternative 4

Alternative 4 proposes fuel breaks along 129 miles of linear features in the project area. The impacts to the visual environment would be the same as described in Alternative 2. While there are fewer overall miles, the reduced miles all occur in VRM III and IV areas. The impacts in Class I areas would be the same as described in alternative 2. Using hand thinning as mitigation, the visual objectives would be met for this alternative.

3.5.2.5 Alternative 5

Similar to alternative 4 this alternative proposes fuel breaks along slightly fewer miles in the project area. The impacts to the visual environment would be the same as described in Alternative 3 but along slightly fewer miles. The visual objectives would be met in this alternative.

3.5.2.6 Alternative 6

Alternative 6 proposes fuel breaks along 69 miles of linear features associated with high human ignitions. These include Interstate 84, Highway 20, and the railroad. The impacts to the visual environment would be the same as described in Alternative 2 but along much fewer miles. The visual objectives would be met along all 69 miles of fuel breaks in this alternative.

3.5.3 Cumulative Effects – Visual Resources

3.5.3.1 Scope of the Analysis

The area used to assess cumulative impacts includes all land within the Paradigm Project boundary. The project boundary is used rather than a larger area because of the unique nature of the management direction specific to the visual resources. The temporal scale dates back to 1980, which is roughly the year many of the existing power lines were constructed, and ends in 2025, slightly longer than the 10-year period for the full project implementation.

3.5.3.2 Current Conditions and Present Effects of Cumulative Actions

Past actions have contributed to the existing state of the visual character of the surrounding landscape of the project area as described in the Affected Environment (Section 3.5.1). Primary influences that have occurred in the past will likely continue into the foreseeable future and continue to affect visual resources. These actions include alternative energy facilities (wind turbines), electrical transmission lines, residential development, motorized vehicle use (associated with authorized uses and recreational uses), grazing, and vegetative changes from wildfire and exotic species introductions.

- Wildfires have burned approximately 70 percent (204,407 acres) of the project area in the last 50 years (1963). ESR and habitat restoration projects would be expected to maintain or improve plant communities and ecological processes in burned and/or degraded areas; however, it can take 30-50 years to reestablish native shrub/steppe habitat.
- Alternative energy projects (mainly wind turbines) began being constructed in the project area in the last 10 years. There are currently more than 50 wind turbines, all on private lands, within the project area. While the total number of turbines that may be constructed is unknown, as efficiencies and profitability increase, it is expected that additional turbines will be constructed.
- Population expansion of the Treasure Valley has been primarily to the west (Canyon, Gem & Payette Counties). However, residential subdivisions have been proposed in the northwest portion of the project area. Additionally, the population is slowing expanding to outlying area of the project area around the communities of Mountain Home and Glenn's Ferry.

3.5.3.3 Alternative 1

Together, wildfires, energy projects, and other human structures will continue to alter the visual landscape of the project area. Undeveloped private land would likely be the primary location of the majority of this change; however, additional projects on federal lands are also likely to occur. While design features would be able to blend some of these projects into the natural landscape, it is likely that others would not, and would alter the visual character of the surrounding visual landscape. The most visually sensitive areas (along the Oregon Trail corridor) are the most vulnerable to these visual changes as a result of wildfires and human structures that cannot be blended into landscape. Loss of native shrub/steppe habitat as a result of large scale wildfires would have moderate to major long-term impacts on the visual landscape character depending on the location.

3.5.3.4 Alternatives 2-6

The cumulative effect from past impacts and from existing and foreseeable man-made projects would be the same as Alternative 1. Creating fuel breaks along existing, linear, man-made features (roads and power lines) would help protect against large scale vegetation changes resulting from wildfires. Visually, these changes would be most noticeable to the casual observer in the form and texture of mature stands of sagebrush/steppe habitat.

The primary difference between the alternatives 2 through 6 is the numbers of miles of fuel breaks. While construction of the fuel breaks would have a weak to moderate long-term adverse effect to the visual landscape, cumulatively, the impact to the form, line, color, and texture of the project area would be a weak, adverse change when added to the existing and foreseeable changes likely to take place in the project area. These changes would primarily affect the vegetation feature and not the land or structures.

3.6 Soils

3.6.1 Affected Environment

Soil information is derived from the Soil Survey of Elmore County Area, Idaho, including parts of Elmore and Ada Counties (Nayak et al. 1991). Major landforms in the western and central portions of the project area include fan remnants, ridges, lava plains, and stream terraces. Common soils on fan remnants and ridges include Lankbush Jenness associations consisting of lacustrine deposits, and/or loess, and/or mixed alluvium derived from igneous rock, as well as Lanktree-Chilcott loams

consisting of loess, and/or volcanic ash, and/or alluvium derived from igneous rock. Common soils on stream terraces and lava plains include Chilcott-Elijah and Kunaton-Chilcott silt loams as well as Colthorp Kunaton complexes consisting of volcanic ash, and/or lacustrine deposits, and/or loess or mixed alluvium over residuum weathered from basalt. All of these soils are well drained, depth to a root restrictive layer ranges from 20 to greater than 60 inches, and organic matter content in the surface horizon is approximately 2%.

The major landforms in the eastern portion of the project area are stream terraces, fan remnants, lava plains, and lava fields. Common soils on lava plains, lava fields, and stream terraces in the northeast portion of the project area include Elijah-Purdam silt loams consisting of lacustrine deposits, and/or loess, and/or alluvium over residuum weathered from basalt. Common soils on fan remnants and stream terraces in the southeast portion of the project area include Royal fine sandy loams consisting of mixed alluvium and/or eolian sands. All of these soils are well drained, depth to a root restrictive layer ranges from 20 to greater than 60 inches, and organic matter content in the surface horizon is approximately 2%.

Wind Erodibility Group (WEG) designations range from 1 through 8 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 assigned to Group 1 are the most susceptible to wind erosion, and those assigned to Group 8 are the least susceptible. In the project area common soils are identified as moderately susceptible to wind erosion and assigned to Groups 3, 5 or 6. A very small percentage of soils in the project area are assigned to Group 1 or 2.

3.6.2 Environmental Consequences

3.6.2.1 Alternative 1- No Action

Without the increased ability to limit the number of acres burned with a network of fuelbreaks across the project area, large and/or frequent wildland fires would continue to occur maintaining much of the project area in an invasive annual infested or early seral grassland state.

Immediately following a wildland fire most of the vegetation cover would be removed, increasing the soil surface temperature and erosion potential across the burned area. Increased fire frequency would affect soil temperature, moisture content, and increase erosion potential at a given location multiple times. In the year following a wildland fire, increases and/or dominance of invasive annual grasses and forbs would likely occur.

Annual grass biomass/roots contribute very limited amounts of organic matter into the soil profile and have less extensive root systems compared to perennial grasses. Annual grass biomass in sufficient quantities provides some protection from wind erosion but very little resistance to water erosion and off-site soil movement during thunderstorm events due to their small limited root systems. 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.

3.6.2.2 Alternative 2

Approximately 1,375 acres of proposed fuelbreaks would be constructed on public and state lands in the project area on soils identified in the soil survey as having high wind erosion potential, 8,540 acres are on soils with moderate wind erosion potential, and 765 acres are on soils with low wind erosion potential. General direct and indirect effects to the soil resource by implementation treatment type are described below.

Disking

Erosion by wind would be the primary short-term effect to the soil resource when disking with a plow. Soil erosion by water could also occur on steeper terrain (> 20% slope). Disking as a means of creating a bare ground fuelbreak would remove existing vegetation cover and disturb the soil surface horizons up to a depth of nine inches altering soil aggregates and making the soil susceptible to erosion for as long as the fuelbreak is maintained. This effect would be more pronounced on coarse textured soils (i.e. sands). The microclimate of treated soils would change, increasing in temperature and dryness.

Disking would result in the immediate disturbance of biological soil crusts (mosses and lichens) 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. The removal or destruction of biological soil crusts could adversely affect soils over time by increasing susceptibility to erosion, encouraging weed establishment, and reducing nitrogen inputs and water infiltration (Belnap 1995, Belnap 1996, Evans and Belnap 1999, Belnap and Gillette 1997, Belnap and Gillette 1998). Recovery rates 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 (Belnap et al. 2001).

Mechanical or Mowing

Short-term effects to the soil resource when using chainsaws to thin sagebrush would be very minimal and confined to those areas where the removed woody material was piled and burned. 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 both 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.

Compaction of the surface soil horizons would be a minor short-term effect when mowing sagebrush from a rubber tired tractor. 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 very minimal and confined to those areas where the tractor tires cross. Disturbance to the 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. For these reasons, soil erosion from wind or water in mowed areas would not be expected to increase above normal levels. No long term effects to the soil resource from mowing and no indirect impacts would be expected. Maintenance mowing would

occur infrequently (every 5-10 years) and therefore added effects to soils due to compaction or erosion from mowing would not be expected.

Herbicide

Impacts to the soil resource from the application of all BLM approved herbicides and adjuvants for the control of invasive, non-native vegetation species have been assessed in the *Vegetation Treatments using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* (USDI BLM 2007a).

The direct short and long-term effect of herbicide application to existing biological soil crusts is largely unknown (Belnap et al. 2001). Limited experiments have shown that crustal species are differentially affected depending on the compound used and the species tested. Exposure could decrease and/or alter species composition of crusts (Metting 1981). Organisms in other portions of the soil profile would either be not affected or may be positively or negatively affected depending on the type of organism and the herbicide used.

When herbicides are used for seedbed preparation followed by drill seeding, a temporary increase in soil surface temperature, dryness, and wind erosion potential (and water erosion potential on steeper terrain) would occur until planted fuelbreak species become established due to the reduction and/or elimination of existing vegetation cover. 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.

Targeted 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 fuelbreak making the soil surface horizon vulnerable to erosional processes for as long as the fuelbreak is maintained. Targeted grazing could be used once in a given location as a method of seedbed preparation. If used in this manner, effects described above would be temporary until seeded species became established. Indirect effects could include sedimentation of adjacent creeks and the Snake River. Management of grazing activities that maintain sufficient vegetation cover would help to ensure that erosion levels are kept to sustainable levels.

Prescribed Fire

Prescribed fire as a seedbed preparation method to remove annual grass standing litter, thatch, and weeds would most often 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. Where medusahead thatch and/or 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 increase the soil surface temperature and erosion potential over the short-term until fuelbreak vegetation is reestablished. Prescribed fire would most often be followed up with an herbicide treatment to control invasive annual plants and a seeding treatment to reestablish fuelbreak vegetation. Prescribed fire control lines may be disked in with a tractor. These additional treatments would further disturb the soil resource making it more susceptible to wind erosion (and water erosion on steeper terrain) over the short-term. Over the long-term planted fuelbreak vegetation would become established protecting the soil from erosional forces.

Seedings

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 minimum 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.

3.6.2.3 Alternative 3

For alternative 3 on BLM/BOR/State managed lands, approximately 1,170 acres of proposed fuelbreak are on soils identified in the Elmore County Soil Survey as having high wind erosion potential, 8,475 acres are on soils with moderate wind erosion potential, and 265 acres are on soils with low wind erosion potential. One hundred fifteen acres were either not rated or not available in the soil survey. General direct and indirect effects to the soil resource by implementation treatment type would be the same as described in Alternative 2 (Proposed Action).

3.6.2.4 Alternative 4

For alternative 4 on BLM/BOR/State managed lands , approximately 1,135 acres of proposed fuelbreak are on soils identified in the Elmore County Soil Survey as having high wind erosion potential, 6,080 acres are on soils with moderate wind erosion potential, and 765 acres are on soils with low wind erosion potential. Sixty-five acres were either not rated or not available in the soil survey. General direct and indirect effects to the soil resource by implementation treatment type would be the same as described in Alternative 2 (Proposed Action).

3.6.2.5 Alternative 5

For alternative 5 on BLM/BOR/State managed lands, approximately 940 acres of proposed fuelbreak are on soils identified in the Elmore County Soil Survey as having high wind erosion potential, 6,360 acres are on soils with moderate wind erosion potential, and 265 acres are on soils with low wind erosion potential. One hundred ten acres were either not rated or not available in the soil survey. General direct and indirect effects to the soil resource by implementation treatment type would be the same as described in Alternative 2 (Proposed Action).

3.6.2.6 Alternative 6

For alternative 6 on BLM/BOR/State managed lands, approximately 685 acres of proposed fuelbreak are on soils identified in the Elmore County Soil Survey as having high wind erosion potential, 2,510 acres are on soils with moderate wind erosion potential, and 135 acres are on soils with low wind erosion potential. Forty acres were either not rated or not available in the soil survey. General direct and indirect effects to the soil resource by implementation treatment type would be the same as described in Alternative 2 (Proposed Action).

3.6.3 Cumulative Effects

3.6.3.1 Scope of Analysis

The 293,891- acre Paradigm project area boundary will serve as the cumulative analysis area. The project area spans portions of numerous watersheds including Ten Mile Creek, Indian Creek, Squaw Creek, Canyon Creek, Bennett Creek, Cold Springs Creek, and Roosevelt Gulch. The project area is generally bordered by the Mayfield Road along the foothills of the Danskin Mountains to the north, King Hill Creek to the east, the Pacific Union railroad right-of-way to the south, and Blacks Creek to the west.

The analysis area was chosen because direct effects to soils are mostly localized in nature and cumulative effects to soils due to other activities would also be mostly localized. Soil erosion by wind and water (predominantly wind) could indirectly affect adjacent areas through soil deposition. Other past, present, and foreseeable actions and events that could have similar indirect impacts to soil on a large scale include wildland fire and the plowing of agricultural fields. The project area is all under 5,000 feet in elevation and in a 7-9 inch precipitation zone where numerous and repeated wildland fire events have occurred over the last 20 years exposing topsoil to erosional forces until such time as vegetation reestablishes. The majority of agricultural croplands in this area also occur under 5,000 feet elevation where soils are exposed to erosional forces during plowing operations and until crops are established.

The temporal frame for cumulative impacts is defined by the continued presence of the effects of past actions and the anticipated longevity of reasonably foreseeable future actions. Direct and indirect effects to soils would dissipate once vegetation is established in the fuel breaks. The proposed action includes 100 miles of 150 foot wide fuel breaks a year for the initial phase and width expansion of these fuelbreaks if needed occurring in a second phase after the first phase is complete. At this rate, the initial phase would take 3 years to accomplish and the second phase two to three years, totaling five to six years for full completion. Successful vegetation establishment following seeding in this area would take an average of five years so direct and indirect effects

would dissipate within ten to eleven years of initial project implementation; therefore, cumulative effects will be considered through 2025.

3.6.3.2 Current Conditions and Effects of Cumulative Actions

Past actions to be considered include livestock grazing, livestock trailing, road construction and right-of-way maintenance, vegetation treatment projects including wildland fire ESR and noxious weed management, fire suppression activities, off-highway vehicle (OHV) use, and agricultural croplands. The collective effect of past actions has contributed to the existing condition of soils described in the Soils Direct and Indirect Effect section above.

The effects of current and foreseeable future activities to soils will include: livestock grazing, livestock trailing, road construction and maintenance, wildland fire, wildland fire suppression and associated ESR projects, fuel break construction of private lands, noxious weed management, Gateway West transmission power line construction and maintenance, and agricultural croplands.

- Permitted livestock grazing affects soils by altering mechanical and biological attributes. Livestock grazing would likely continue to result in temporally and spatially variable areas of soil surface degradation and plant community alterations that cause minor to moderate effects to soils (e.g., soil compaction, increased exposure to erosional forces, damage to biological soil crusts, and reduced nutrient input). These effects would be greatest in localized areas adjacent to gates, watering, and dietary supplement areas.

- Road construction and ROW maintenance along roads (improved and primitive) will continue to cause minor to moderate soil erosion and displacement within maintained buffers. These effects are generally spatially restricted to existing locations and occur over a continuous temporal scale.

- Depending on drill equipment (e.g., rangeland and minimum till/Truax drills), short-term increases in soil disturbance and displacement will occur during drill seeding operations associated with ESR projects and fuel break construction on private lands. Successful aerial seeding would help limit short-term soil erosion and stabilize watersheds over the long term; successful drill seeding would stabilize soils over the long term, as well.

- Noxious and invasive weed treatments could result in localized, short-term exposure of soils to erosion until other species become established in treated areas. By preventing the loss of native habitats through weed control, it is expected that overall, long-term soil loss from erosional forces would be negligible to minor.

- The spatial and temporal extent of OHV activities is difficult to quantify. However, OHV use could affect the soil resource by disrupting soil surfaces, biological soil crusts, and enlarging gaps between vegetation, particularly if users travel cross-country (no trail). Susceptibility to erosion and weed invasion/expansion would increase in these areas.

- Fire history indicates that wildland fire is common and will continue to affect the project area in the future, however the location and extent of these wildland fires is unknown. Moderate to severe wildland fire removes existing vegetation and litter from a site exposing the soil

surface to erosional forces for a year or more until vegetation reestablishes. Soils on hilltops, ridges, and steep slopes are the most vulnerable to both wind and water erosion.

- Fire suppression activities will vary temporally and spatially depending on annual fire severity and extent. Suppression related disturbances are generally restricted to bulldozer constructed fireline. Impacts to the soil resource from bulldozed fire lines includes the disturbance of soil structure in the upper soil horizons and subsequent exposure to erosional forces until vegetation reestablishes. Compaction of soils from bulldozer line construction does not usually occur because of the limited number of passes (one or two). Seeding post-fire of dozer lines is a fire suppression standard operating procedure and limits long-term soil displacement.

- The Gateway West transmission line construction will disturb the structure of the upper soil horizons and expose soil to erosional forces by removing vegetation cover in and around transmission pole sites, co-generation sites, substation sites, as well as access and service roads constructed. Some of these areas (roads, pole sites) would remain in a denuded condition long-term increasing the potential for erosion. Decommissioning activities, when they occur, would also result in exposed soils and accelerated erosion for a period of time until vegetation reestablishes. Compact of soils would occur where heavy equipment traffic takes place during construction, operations, and decommission.

- There are 24,952 acres of agricultural croplands that fall within the boundaries of the project area. The location of actively farmed acres is somewhat variable from year to year however the total acres disturbed in any given year would be approximately the same. Soil structure is disturbed during and after plowing operations and expose topsoil to erosional forces (particularly wind) until crops are established.

3.6.3.3 Alternative 1 (No Action)

Past, present, and foreseeable future actions within the project area are having and would continue to have moderate to heavy 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. During years of high wildland fire activity the extent of exposed soil would increase dramatically. Soil compaction has occurred and would continue to occur in those areas of heavy and frequent use by vehicles, heavy equipment, and livestock. Soil erosion and displacement due primarily from wind during and for several weeks following the plowing of agricultural fields would continue to occur. Without functioning fuel breaks in place and given the extent of annual grass dominated vegetation within the project area as well as high human ignition potential, large and frequent wildland fires would continue to occur. Large acreages would continue to experience exposed topsoil and increased potential for soil loss a year or more following each fire until vegetation reestablishes.

3.6.3.4 Alternative 2 – 6 (Action Alternatives)

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. However, with a network of effective fuel breaks in place, the number of acres and length of time topsoil would be exposed to erosional forces due to wildland fires would likely

decrease as firefighters gain increased opportunity to safely put out fires before they get large. Any of the action alternatives would only slightly increase the cumulative impacts to the soil resource when considered with other past, present, and foreseeable future actions and could, in the long run, be a worthwhile trade-off for reduced wildland fire size and reduced potential for soil erosion from large burned areas.

3.7 Air Quality

3.7.1 Affected Environment

Mountain Home and Elmore County are designated as a Class II air quality area, as is most of Idaho. Areas of Class II need reasonably or moderately good air quality protection. Much of the focus on air quality in the Boise 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 Elmore County as well, the county's location and distance from other populated areas in the valley prevent significant exchange of air pollutants.

Air quality is rarely an issue in the Mountain Home area (citation needed). Impacts to air quality across the project area can be derived from several sources including vehicle emissions, Mountain Home Air Base, wildfire, prescribed fires, agricultural operations (farming and feed lots), and fugitive dust. 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.

3.7.2 Environmental Consequences

3.7.2.1 Alternative 1

There would be no impacts to air quality from establishing fuel breaks. However, the spread of invasive 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 IDEQ designated PM10 limited maintenance areas and/or impact zones such as the city of Boise.

3.7.2.2 Alternative 2-6

Burning is one of the tools that could be used to prepare an area for seeding of fuel break vegetation. This type of prescribed fire would be of short duration due to the light fuels that would make up the vast 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 IDIQ's air quality standards. 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 ours 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.

3.7.3 Cumulative Effects

None of the actions being analyzed for cumulative effects (livestock grazing, Gateway West transmission lines, noxious weed treatments, or recreation) would cause measurable impacts to air quality. Additionally, there would be minimal impacts from any of the proposed tools that could be implemented for fuel break development. Therefore, there would be no cumulative impacts to air quality.

4.0 Consultation and Coordination

4.1 List of Preparers

Name	Title
Amy Stillman	Great Basin Institute – Botanist (Contractor)
Karen Kumiega	BLM - BDO Cultural Resource Specialist
Sarah Garcia	BLM - BDO Fire Ecologist
Larry Ridenhour	BLM - FRFO Outdoor Recreation Planner
Karen Fullen	NRCS - State Biologist
Seth Flanigan	BLM - BDO NEPA Specialist
Chris Clay	BLM – BDO GIS Coordinator
Mike McGee (Team Lead)	BLM - BDO Wildlife Biologist/Project Lead

4.2 Agencies, Organizations, Tribes, and Individuals Consulted

USFWS Snake River Basin Office
Boise District Resource Advisory Council
Idaho State Historic Preservation Officer
Idaho Department of Lands
Idaho Department of Fish and Game
Shoshone-Paiute Tribes
Shoshone-Bannock Tribes

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 BLMs 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.

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.

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.

Baker, W. L., 2006. Fire and Restoration of Sagebrush Ecosystems. *Wildlife Society Bulletin* 34, (1): 177-185.

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*.

Bates, J. D., E. C. Rhodes, K. W. Davies, and R. Sharp. 2009. Postfire succession in big sagebrush steppe with livestock grazing. *Rangeland Ecology and Management*, 62:98-110.

Belnap, J. and D.A. Gillette. 1998. Vulnerability of desert soil surfaces to wind erosion: impacts of soil texture and disturbance. *Journal of Arid Environments* 39: 133-142.

Belnap, J. 1995. Surface disturbances: their role in accelerating desertification. *Environmental Monitoring and Assessment* 37: 39-57.

Belnap, J. 1996. Soil surface disturbances in cold deserts: effects on nitrogenase activity in cyanobacterial-lichen soil crusts. *Biology and Fertility of Soils* 23:362-367.

Belnap, J., and D.A. Gillette. 1997. Disturbance of biological soil crusts: impacts on potential wind erodibility of sandy desert soils in southeastern Utah, USA. *Land Degradation and Development* 8: 355-362.

Belnap, J., and D. Eldridge, 2001, Disturbance and recovery of biological soil crusts, *in* Belnap, J., and Lange, O. L., eds., Biological Soil Crusts: Structure, Function, and Management: Berlin, Springer-Verlag, p. 363-383.

Belnap, J., J.H. Kaltenecker, R. Rosentreter, J. Williams, S. Leonard, and D. Eldridge. 2001. Biological soil crusts: ecology and management. USDI Bureau of Land Management TR-1730-2, 110p.

Billinge, S.A., I.C. Robertson. 2008. Spatial structure and inbreeding depression in slickspot peppergrass, *Lepidium papilliferum* (Brassicaceae). *Botany*. 86: 1002-1008.

Black, S.J., Hodges, N. Vaughan, M. and Shepherd, M. 2007. Pollinators in Natural Areas, A Primer on Habitat Management. Invertebrate Conservation Fact Sheet. The Xerces Society for Invertebrate Conservation. 8 pp.

Braun, C. E. 1998. Sage grouse declines in western North America: what are the problems? Proceedings of the Western Association of State Fish and Wildlife Agencies 78:139-156.

Bryan, Neal M., Val Jo Anderson and Rachel A. Fugal, 2011 Disturbance to Surface Lithic Components of Archaeological Sites by Drill Seeding. *Rangeland Ecology & Management*, 64(2): 171-177.

Bunting, S.C., B.M. Kilgore, and C.L. Bushey. 1987. Guidelines for prescribed burning sagebrush-grass rangelands in the northern Great Basin. United States Department of Agriculture Forest Service, General Technical Report INT-231.

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.

Bury, RB. 2004. Wildfire, fuel reduction, and herpetofaunas across diverse landscape mosaics in northwestern forests. *Conservation Biology* 18:968–75.

Buseck, R. S., D. A. Keinath, and M. Geraud. 2005. Species assessment for Great Basin spadefoot toad (Spea intermontana) in Wyoming. Bureau of Land Management, Wyoming State Office, Cheyenne Wyoming. Pp. 59.

Butcher, G. S., D. K. Niven, A. O. Panjabi, D. N. Pashley, and K. V. Rosenberg. 2007. The 2007 WatchList for United States Birds. *American Birds*, 61:18–25.

Call, M.W. and C. Maser. 1985. Wildlife habitats in managed rangelands--the great basin of southeastern Oregon: Sage grouse. General Technical Report Pacific Northwest-GTR-187. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.

Colket, B., S. Cooke, and M. Mancuso. 2006. Element occurrence review and update for slickspot peppergrass (*Lepidium papilliferum*). Idaho Department of Fish and Game, Idaho Conservation Data Center, Boise. 45 pp. plus appendices.

Collins, C.P. and T.D. Reynolds (2005, September 2). Ferruginous Hawk (*Buteo regalis*): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/ferruginoushawk.pdf [July 18, 2013].

Collopy, M. W. 1983. A comparison of direct observations and collections of prey remains indetermining the diet of Golden Eagles. *Journal of Wildlife Management*, 47:360–368.

Collopy, M.W. and T.C. Edwards. 1989. Territory size, activity budget, and the role of undulation flight in nesting Golden Eagles. J. Field Ornithol. 60:43-51.

Connelly, J.W., M.A. Schroeder, A.R. Sands, and C.E. Braun. 2000. Guidelines to manage sage grouse populations and their habitats. Wildlife Society Bulletin 28:967-985.

Conservation Agreement on Idaho BLM Existing LUPs and Ongoing Activities Affecting Slickspot Peppergrass (BLM-FWS-2013), entire.

Cossel, J.O., JR. 2003. Changes in reptile populations in the Snake River Birds of Prey Area, Idaho between 1978–1979 and 1997–1998: The effects of weather, habitat and wildfire. Doctoral dissertation, Idaho State University, Pocatello, ID.

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

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., R.L. Sheley, and J.D. Bates. 2008. Does fall prescribed burning *Artemisia tridentata* steppe promote invasion or resistance to invasion after a recovery period? Journal of Arid Environments. 72:1076-1085.

Dechant, J. A., M. L. Sondreal, D. H. Johnson, L. D. Igl, C. M. Goldade, A. L. Zimmerman, and B. R. Euliss. 1999 (revised 2002). Effects of management practices on grassland birds: Ferruginous Hawk. Northern Prairie Wildlife Research Center, Jamestown, North Dakota.

DeLong, J. P. 2004. Effects of management practices on grassland birds: Golden Eagle. Northern Prairie Wildlife Research Center, Jamestown, North Dakota.

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.

Ehrlich, P. R., D. S. Dobkin, and D. Wheye. 1988. *The birder's handbook*. Simon and Shuster, New York.

Evans, R.D., and J. Belnap. 1999. Long-term consequences of disturbance on nitrogen-cycling in an arid grassland. *Ecology*. 80: 150-160.

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

Fisher. H., L. Eslick, M. Seyfried. 1996. Edaphic Factors That Characterize the Distribution of *Lepidium papilliferum*. Technical Bulletin No. 96-6. Idaho Bureau of Land Management. April 1996. 23 pp.

Gano, K., and W. Rickard. 1982. Small mammals of a bitterbrush-cheatgrass community. Northwest Science 56:1–7.

Garton, E. O., J. W. Connelly, J. S. Horne, C. A. Hagen, A. Moser, and M. A. Schroeder. 2011. Greater Sage-Grouse Population Dynamics and Probability of Persistence. Pp. 293-382 *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

Gillan, J. K., E. K. Strand, J. W. Karl, K. P. Reese, T. Laninga. 2013. Using spatial statistics and point-pattern simulations to assess the spatial dependency between greater sage-grouse and anthropogenic features. *Wildlife Society Bulletin*, 37:301-310

Graham, S., and T. A. Messmer. 2011. 2012 Annual Report Greater sage-grouse (Centrocercus urophasianus) habitat selection and use patterns in response to vegetation management practices in Western Box Elder County, Utah.

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.

Groom. M.J. 2001. Consequences of subpopulation isolation for pollination, herbivory, and population growth in *Clarikia concinna concinna* (Onagraceae). *Biological Conservation*, 100, 55-63.

Hagen, C. A. 2011. Greater sage-grouse conservation assessment and strategy for Oregon: a plan to maintain and enhance populations and habitat. Salem, OR, USA: Oregon Department of Fish and Wildlife. 207 p.

Hall, L. K. 2012. Effect of cheatgrass on abundance of the North American deer mouse. *The Southwestern Naturalist*, 57(2):166-169

Hall, L. K., J. F. Mull, and J. F. Cavitt. 2009. Relationship between cheatgrass coverage and the relative abundance of snakes on Antelope Island, Utah. *Western North American Naturalist* 69:88–95.

Hanser, S. E., C. L. Aldridge, M. Leu, M. M. Rowland, S. E. Nielsen, and S. T. Knick. .2011. Greater sage-grouse: general use and roost site occurrence with pellet counts as a measure of relative abundance. *Sagebrush ecosystems conservation and management: ecoregional assessment tools and models for the Wyoming Basins*. Allen Press, Lawrence, Kansas, USA, 112-140.

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.

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., et al. 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., Kaiser, R.C. & Hubert, W.A. (2010). Yearling greater sage-grouse response to energy development in Wyoming. *Journal Wildlife Management*, 74, 65–72.

Holloran, Matthew J. 2005. Greater Sage-Grouse (*Centrocercus urophasianus*) Population Response to Natural Gas Field Development in Western Wyoming. PhD, Department of Zoology and Physiology, December, 2005.

Holmes, J.A. and M.J. Johnson (2005, January 13). Brewer's Sparrow (Spizella breweri): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/brewerssparrow.pdf [4/13/2011].

Hossack, B. R., and P. S. Corn. 2007. Responses of pond-breeding amphibians to wildfire: short term patterns in occupancy and colonization. *Ecological Applications*, 17:1403–1410.

Huang, Z., I. Boubriak, D.J. Osborne, M. Dong, Y. Gutterman. 2008. Possible Role of Pectin-containing Mucilage and Dew in Repairing Embryo DNA of Seeds Adapted to Desert Conditions. *Annals of Botany*, 101(2): 277-283.

Hunt, G. 2002. Golden Eagles in a Perilous Landscape: Predicting the Effects of Mitigation for Wind Turbine Bladestrike Mortality. Report P500-02-034F. California Energy Commission, Sacramento.

Hutchison, D. and L.R. Jones, *Editors, 1993*, Emigrant Trails of Southern Idaho. Adventures in the Past – *Idaho Cultural Resource Series, Number 1*. *Bureau of Land Management and the Idaho State Historical Society.*

IDFG. 2008. Idaho's Birds of Prey. Idaho Department of Fish and Game, Boise ID. 45 pp.

Idaho Sage-grouse Advisory Committee. 2006. Conservation Plan for the Greater Sage-grouse in Idaho.

Jennersten, O. 1988. Pollination in Dianthus deltoids (Caryophyllaceae): Effects of Habitat Fragmentation on Visitation and Seed Set. *Conservation Biology*, 2(4): 359-366.

Johnson, D. H., M. J. Holloran, J. W. Connelly, S. E. Hanser, C. L. Amundson, and S. T. Knick. 2011. Influences of Environmental and Anthropogenic Features on Greater Sage-grouse Populations. Pp. 407-450 *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.

Johnson, R. 1997. Introduction to Microbiotic Crusts. United Stated Department of Agriculture Natural Resources Conservation Service.

Keeley, W. H. and J. M. Bechard. 2011. Flushing distances of ferruginous hawks nesting in rural and exurban New Mexico. *The Journal of Wildlife Management*, 75: 1034–1039.

Kinter, C.L., D.L. Clay, J.R. Fulkerson, and J.J. Miller. 2012. Habitat Integrity and Population Monitoring of *Lepidium papilliferum* (Slickspot Peppergrass): 2011. Idaho Natural Heritage Program, Idaho Department of Fish and Game, Boise. 61 pp

Klos, Z., J., Abatzoglou, J.J. Blades, M. Clark, C. Currie, M. Dodd, S. Eigenbrode, T. Hall, A. Haruch, J.Hicke, P. Higuera, J. Holbrook, V. Jansen, K.B. Kemp, A. Lamar, A. Lankford, T. Link, T. Magney, A. Meddens, L. Mitchell, B. Moore, P. Morgan, B. Newingham, R. Niemeyer, B. Soderquist, A. Suazo, C. Teston, K. Vierling, V. Walden, C. Walsh2012. *Indicators of Climate Change in Idaho: The intersection of biophysical change with social perception across a diverse landscape*. Oral Presentation: 3rd Annual Pacific Northwest Climate Science Conference; Boise, ID.

Klos, Z., T. Link, J. Abatzoglou, 2013. Extent of the rain-snow transition zone in the western U.S. under historic and projected climate, *In prep. for submission to Geophysical Research Letters*.

Knick, S. T. and D. L. Dyer. 1997. Distribution of black-tailed jackrabbit habitat determined by GIS in southwestern Idaho. *Journal of Wildlife Management*, 61: 75-86.

Knick, S. T. and J. T. Rotenberry. 1995. Landscape Characteristics of Fragmented Shrubsteppe Habitats and Breeding Passerine Birds. *Conservation Biology*, 9: 1059–1071.

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., A. L. Holmes, and R. F. Miller. 2005. The role of fire in structuring sagebrush habitats and bird communities. Studies. *Avian Biology* 30:63-193.

Knick, S. T., and J. T. Rotenberry. 2000. Ghosts of habitats past: contribution of landscape change to current habitats used by shrubland birds. *Ecology* 81*:*220–227.

Knick, S. T., S. E. Hanser, R. F. Miller, D. A. Pyke, M. J. Wisdom, S. P. Finn, E. T. Rinkes, and C. J. Henny. 2011. Ecological Influence and Pathways of Land Use in Sagebrush. Pp. 203-251 *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.

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.

Kochert, M.N., K. Steenhof and M.J. Bechard. 2002. Territory occupancy and productivity of Golden eagle nesting in the Snake River Birds of Prey National Conservation Area and comparison area, 2001. Challenge cost share project final report. US Department of the Interior, Bureau of Land Management, Lower Snake River District, Boise, ID.

Leonard, K.M., Reese, K.P. & Connelly, J.M. 2000: Distribution and habitats of sage grouse Centrocercus urophasianus on the upper Snake River plain of Idaho: changes from the 1950s to the 1990s. - Wildlife Biology 6: 265-270.

Lyon, A. G., and S. H. Anderson. 2003. Potential Gas Development Impacts on Sage-grouse Nest Initiation and Movement. *Wildlife Society Bulletin*, 31(2) : 486-491.

Mancuso, M. 2000 *Field investigation for* Lepidium papilliferum (*slickspot peppergrass*) *on Idaho BLM lands in the Mountain Home-Glenns Ferry Area*. Unpublished report on file at Conservation Data Center, Idaho Department of Fish and Game.

Marzluff, J.M., S.T. Knick, M.S. Vekasy, L.S. Schueck and T.J. Zarriello. 1997. Spatial use and habitat selection of golden eagles in southwestern Idaho. *Auk* 114: 673-687.

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.

McGrath C.L., Woods A.J., Omernik, J.M., Bryce, S.A., Edmondson, M., Nesser, J.A., Shelden, J., Crawford, R.C., Comstock, J.A., and Plocher, M.D. 2002. Ecoregions of Idaho (color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia,U.S. Geological Survey (map scale 1:1,350,000).

Merriam, K.E., J.E. Keeley, and J.L. Beyers. 2006. Fuel breaks affect nonnative species abundance in Californian plant communities. *Ecological Applications*. 16(2):515-527.

Metting, F.B. 1981. The systematics and ecology of soil algae. Botanical Review 47: 195-312.

Meyer S.E., D. Quinney, J. Weaver. 2006. A stochastic population model for *Lepidium papilliferum* (Brassicaceae), a rare desert ephemeral with a persistent seed bank. *American Journal of Botany*, 93(6):891-902.

Meyer S.E., P.S. Allen. (2005) Lepidium papilliferum *Soil and Seed Bank Characterization on the Orchard Training Area*. Unpublished Report. U.S. Forest Service, Intermountain Research Station, Shrub Sciences Laboratory, Provo, Utah. Department of Plant and Animal Science, Brigham Young University, Provo, Utah, USA.

Meyer SE, Quinney D, Weaver J (2005 A life history of the Snake River plains endemic *Lepidium papilliferum* (Brassicaceae). *Western North American Naturalist*, 65, 11-23.

Meyer, S.E., & D. Quinney. 1993. A Preliminary Report on Edaphic Characteristics of *Lepidium papilliferum* Microsites on the Orchard Training Area, Ada County, Idaho. Intermountain Research Station, USDA Forest Service, Provo. 8 pp.

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., and D. Turnipseed. 1990. Seeding forage kochia into cheatgrass infested ranges. In: McArthur ED, Romney EM, Smith SD,Tueller PT, comps. Proceedings, Symposium on Cheatgrass Invasion, Shrub Dieoff, and Other Aspects of Shrub Biology and Management; 1989 April 5–7. Las Vegas, NV. Gen.Tech. Rep. INT-276. Ogden, UT: USDA Forest Service, Intermountain Research Station: 66–71 p.

Monsen, S. B.1994. Selection of plants for fire suppression on semiarid sites. p. 363-373. In: S.B. Monsen and S.G. Kitchen (compilers). Proceedings-symposium on ecology and management of annual rangelands. 18-21 May 1992. Boise, ID. Gen. Tech. Rep. INT GTR-313. USDA Forest Service, Intermountain Research Station, Ogden, Ut. 416 p.

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.

Moseley, R.K. 1994. Report on the conservation status of *Lepidium papilliferum*. Status Survey Report prepared for Idaho Department of Parks and Recreation through Seciton 6 funding from U.S. Fish and Wildlife Service, Region 1. 99p.

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

National Geographic Society. 2006. *Field guide to the birds of North America*. 5th edition.

NatureServe. 2002. Element occurrence data standard. NatureServe in cooperation with the Network of Natural Heritage Programs and Conservation Data Centers, Rosslyn, VA. 201 pp.

Naugle, D. E., K. E. Doherty, B. L. Walker, M. J. Holloran, and H. E. Copeland. 2011. Energy development and Greater Sage-Grouse. Pp. 489-503 *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.

Nayak, A., D. Marks, D. G. Chandler, and M. Seyfried (2010), Long-term snow, climate, and streamflow trends at the Reynolds Creek Experimental Watershed, Owyhee Mountains, Idaho, United States, Water Resour. Res., 46, W06519, doi:10.1029/2008WR007525.

Noe, H.R. 1991. Soil survey of Elmore county area, Idaho, parts of Elmore, Owyhee, and Ada counties. U.S. Department of Agriculture, Soil Conservation Service, Moscow, ID.

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.

Odell, G. H. and *F*. Cowen. 1987 Tillage Effects on Artifact Distributions. American Antiquity. 52*(3):* 456-484.

Ogle, D., M. Stannard, P. Scheinost, and L. St John. 2010. Plant guide for sheep fescue (*Festuca ovina*). USDA-Natural Resources Conservation Service, Idaho and Washington Plant Materials Program.

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.

Paige, C., and S. A. Ritter. 1999. Birds in a sagebrush sea: managing sagebrush habitats for bird communities. Boise, Idaho: Partners in Flight Western Working Group.

Pierson, F.B., W.H. Blackburn, and S.S. VanVactor. 2007. Hydrologic impacts of mechanical seeding treatments on sagebrush rangelands. Rangeland Ecology and Management. 60(6):666-674.

Pilliod, D.S., et al. 2003. Fire and amphibians in North America. *Ecology Management*. 178, 163–181.

Plew, Mark G. 2008, *The Archaeology of the Snake River Plain, Second Edition.* Department of Anthropology, Boise State University, Boise, ID

Rachael, J. 2011. Mule Deer. Annual Report. Project W-170-R-34. Idaho Department of Fish and Game, Boise, USA.

Reisner, M.D, et al. 2013. Conditions favouring *Bromus tectorum* dominance of endangered sagebrush steppe ecosystems. *Journal of Applied Ecology* 10(1111):1-11.

Rickard, W. H. 1970. Ground dwelling beetles in burned and unburned vegetation. *Journal of Range Management* 23:293–294.

Robertson I.C., A. C. Ulappa. 2004. Distance between pollen donor and recipient influences fruiting success in slickspot peppergrass, *Lepidium papilliferum*. *Canadian Journal of Botany*, 82, 1705-1710.

Rochester, C. J., et al. 2010. Reptile and Amphibian Responses to Large-Scale Wildfire in Southern California. *Journal of Herpetology*, 44(3): 333-351.

Russell, K. R., et al. 1999. Prescribed fire effects on herpetofauna: review and management implications. *Wildlife Society Bulletin*. 27(2): 374-384.

Rust, J. and D. Earl. 2011 Rebuttal: Disturbance to Surface Lithic Components of Archaeological Sites by Drill Seeding. *Rangeland Ecology & Management*, 64(5):548-551.

Sage-grouse National Technical Team. 2011. A Report on National Greater Sage-grouse Conservation Measures. Pp.74

Sands, A. R., et al. 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.

Schoeberl, B. C. 2003. Influence of fragmentation on shrubsteppe-obligate passerines. Unpubl. M.S. Thesis, Boise State University, Boise, ID.

Schwantes, Carlos A. 1991, *In Mountain Shadows, A History of Idaho*. University of Nebraska Press.

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.

St. John, L. and D. G. Ogle. 2009. Green Strips or Vegetative Fuel Breaks. Tech. Note No. 16. Aberdeen, ID: U.S. Department of Agriculture, Natural Resources Conservation Service, Aberdeen Plant Materials Center. March 5, 2009. 16p.

Steenhof, K., et al. 2006. Population and habitat relationships of Piute ground squirrels in southwest Idaho. *Western North American Naturalist* 66*:*482–491.

Steenhof, K., et al. 1997. Interactive effects of prey and weather on Golden Eagle reproduction. *Journal of Animal Ecology* 66:350–362.

Stevens, R., and E. D. McArthur. 1990. 'Immigrant' forage kochia competition with halogeton following various seeding techniques. In: McArthur, E. Durant; Romney, Evan M.; Smith, D.; Tueller, Paul T., comps. Proceedings symposium on cheatgrass invasion, shrub die-off, and other aspects of shrub biology and management; 1989 April 5-7; Las Vegas, NV. Gen. Tech. Rep. INT-276. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station: 175-180.

Stewart, G. and A.C. Hull. 1949. Cheatgrass (*Bromus tectorum* L.)—An ecological intruder in southern Idaho. *Ecology*. 30(1):58-74.

Stillman, A.J. 2006. Population genetics and mating system of the rare polyploidy *Lepidium papilliferum* (Brassicaceae), a south-western Idaho endemic. M.S. thesis, Boise State University, Boise, Idaho.

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 (ISSN: 2251-0044) Vol. 3(10) pp. 353-361.

Tagestad, J. D., and J. L. Downs. 2007. Landscape Measureas of Rangeland Condition in the BLM Owyhee Pilot Project: Shrub Canopy Mapping, Vegetation Classification, and Detection of Anomalous Land Areas. Pacific Northwest National Laboratory, Richland, Washington, PNNL-17209.

Tuason, T. 2005. 1987-2004 Monitoring results of *Lepidium davisii* in the Mountain Home District. USDI BLM Boise District, Boise, ID, USA.

USDI BLM. 2002. Instruction Memorandum No. CO-2002-029. Interim Historic Preservation Guidelines and Procedures for Evaluating the Effects of Rangeland Management Activities on Historic Properties.

USDI BLM. 2006. Addendum to the Normal Fire Emergency Stabilization and Rehabilitation Plan Biological Assessment for the Boise District and the Jarbidge Field Office of the Twin Falls District.

USDI BLM. 2012. Greater sage-grouse interim management policies and procedures. Instruction Memorandum IM 2012-043, Washington Office BLM. Washington, D.C. http://www.blm.gov/pgdata/etc/medialib/blm/wy/resources/efoia/IMs/2012.Par.56874.File.dat/wy2012-019.pdf

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. 2007b. Record of Decision-Vegetation Treatments Using Herbicides on Bureau of Land Management Land Lands in 17 Western States Programmatic Environmental Impact Statement.

USDI BLM. 2007c. Vegetation Treatments Using Herbicides on Bureau of Land Management Land Lands in 17 Western States Programmatic Biological Assessment.

USDI BLM 2011. Biological Assessment for Slickspot Peppergrass (*Lepidium papilliferum*): The Effects of Proposed Big Fire Herbicide Applications. 20 pp.

USDI BLM. 2013. Final Environmental Impact Statement Gateway West Transmission Line Project. BLM Idaho State Office, U.S. Department of Interior.

USDI BLM and Fish and Wildlife Service (BLM and USFWS). 2013. Conservation Agreement for Idaho Bureau of Land Management existing land use plans. pp. 35.

USDI BLM, Boise District – Oregon Trail Management Plan Idaho. 1984. Manuscript on file at the Four Rivers Field Office, Boise, ID.

USDI U.S. Fish and Wildlife Service. 2010a. Endangered and Threatened Wildlife and Plants; 12-Month Findings for Petitions to List the Greater Sage-Grouse (Centrocercus urophasianus) as Threatened or Endangered. Federal Register, 75 FR 13910 14014.

USDI U.S. Fish and Wildlife Service. 2003. The best available information for slickspot peppergrass (*Lepidium papilliferum*). Snake River Fish and Wildlife Office, Boise, Idaho. 41 pp.

USDI U.S. Fish and Wildlife Service. 2006. A framework to assist in making endangered species act determinations of effect for slickspot peppergrass: *Lepidium papilliferum*. Snake River Fish and Wildlife Office, Boise, Idaho. (September 2006, 09/14/06 version) 66 pp.

USDI U.S. Fish and Wildlife Service. 2008. Birds of Conservation Concern 2008. United States Department of Interior, Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, Virginia. 85 pp. [Online version available at <http://www.fws.gov/migratorybirds/>]

USDI U.S. Fish and Wildlife Service. 2009. Federal Register/Vol. 74, No. 194. Endangered and Threatened Wildlife and Plants; Listing *Lepidium papilliferum* (Slickspot Peppergrass) as a Threatened Species Throughout Its Range. October 8, 52014-52064 pp.

USDI U.S. Fish and Wildlife Service. 2011. Federal Register/Vol. 76, No. 90. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for *Lepidium papilliferum* (Slickspot Peppergrass). May 10, 27184-27215 pp.

USDI U.S. Fish and Wildlife Service. 2012. U.S. Fish and Wildlife Service, Idaho Fish and Wildlife Office, *Lepidium papilliferum* (slickspot peppergrass): Draft Guidance for planning and evaluating fuel breaks in Idaho. December 14, 2012. 11 pp.

Van Horne, B., et al. 1997. Effects of drought and prolonged winter on Townsend's ground squirrel demography in shrubsteppe habitats. *Ecological Monographs* 67:295–315.

Waldron, B. 2011 Strategic Use of Forage Kochia (Kochia prostrata) to Revegetate Wildlife Habitat. *Natural Resources and Environmental Issues*: Vol. 17, Article 17.

White, C. M., and T. L. Thurow. 1985. Reproduction of ferruginous hawks exposed to controlled disturbance. Condor 87:14–22.

White, J.P. 2009. Seed Predation on Slickspot Peppergrass by the Owyhee Harvester Ant. M.S. Thesis in Biology. Boise State University, Boise. 68 pp.

Wicklow-Howard, M., et al. (2003). Effects of biological soil crusts on seed germination of Bromus tectorum. In Rangelands in the New Millennium. Proc. 7th Int. Rangel. Congr., eds N. Allsopp, A.R. Palmer, S.J. Milton, K.P Kirkman, G.I.H. Kerley, C.R. Hurt and C.J. Brown, pp. 1276–1278. Document Transformation Technologies, Pretoria.

Wiens, J. A., and J. T. Rotenberry. 1985. Response of breeding passerine birds to rangeland alteration in a North American shrubsteppe locality. Journal of Applied Ecology 22:655 668.

Wyoming Interagency Vegetation Committee. 2002. Wyoming Guidelines for Managing Sagebrush Communities with Emphasis on Fire Management. Wyoming Game and FishDepartment and Wyoming BLM. Cheyenne, WY. 53 pp.

Yensen, E. and P.W. Sherman. 2003. Ground-dwelling squirrels of the Pacific Northwest. U.S. Fish and Wildlife Service, Snake River Fish and Wildlife Office, and Bureau of Land Management, Spokane District and Oregon State Offices.

Yensen, E., Quinney, D. L., Johnson, K., Timmerman, K., Steenhof, K. 1992. Fire vegetation changes, and population fluctuations of Townsend's ground squirrels. *American Midland Naturalist* 128:299–312.

Young, J.A., R.A. Evans, R.E. Eckert, Jr., and B.L. Kay. 1987. Cheatgrass. Rangelands 9:266-270.

6.0 Appendices

6.1.1 Herbicide Treatment Standard Operating Procedures

From - BLM Vegetation Treatments Using Herbicides Final Programmatic EIS Record of Decision

APPENDIX B

HERBICIDE TREATMENT STANDARD OPERATING PROCEDURES

This section identifies standard operating procedures (SOPs) that will be followed by the U.S. Department of the Interior Bureau of Land Management (USDI BLM) under all alternatives to ensure that risks to human health and the environment from herbicide treatment actions will be kept to a minimum. Standard operating procedures are the management controls and performance standards required for vegetation management treatments. These practices are intended to protect and enhance natural resources that could be affected by future vegetation treatments.

Prevention of Weeds and Early Detection and Rapid Response

Once weed populations become established, infestations can increase and expand in size. Weeds colonize highly disturbed ground and invade plant communities that have been degraded, but are also capable of invading intact communities. Therefore, prevention, early detection, and rapid response are the most cost-effective methods of weed control. Prevention, early detection, and rapid response strategies that reduce the need for vegetative treatments for noxious weeds should lead to a reduction in the number of acres treated using herbicides in the future by reducing or preventing weed establishment.

As stated in the BLM's *Partners Against Weeds: An Action Plan for the BLM*, prevention and public education are the highest priority weed management activities. Priorities are as follows:

- Priority 1: Take actions to prevent or minimize the need for vegetation control when and where feasible, considering the management objectives of the site.
- Priority 2: Use effective nonchemical methods of vegetation control when and where feasible.
- Priority 3: Use herbicides after considering the effectiveness of all potential methods or in combination with other methods or controls.

Prevention is best accomplished by ensuring the seeds and vegetatively reproductive plant parts of new weed species are not introduced into new areas.

The BLM is required to develop a noxious weed risk assessment when it is determined that an action may introduce or spread noxious weeds or when known habitat exists. If the risk is moderate or high, the BLM may modify the project to reduce the likelihood of weeds infesting the site, and to identify control measures to be implemented if weeds do infest the site.

To prevent the spread of weeds, the BLM takes actions to minimize the amount of existing non-target vegetation that is disturbed or destroyed during project or vegetation treatment actions (Table B-1). During project planning, the following steps are taken:

- Incorporate measures to prevent introduction or spread of weeds into project layout, design, alternative evaluation, and project decisions.
- During environmental analysis for projects and maintenance programs, assess weed risks, analyze potential treatment of high-risk sites for weed establishment and spread, and identify prevention practices.
- Determine prevention and maintenance needs, to include the use of herbicides if needed, at the onset of project planning.
- Avoid or remove sources of weed seed and propagules to prevent new weed infestations and the spread of existing weeds.

During project development, weed infestations are prioritized for treatment in project operating areas and along access routes. Weeds present on or near the site are identified, a risk assessment is completed, and weeds are controlled as necessary. Project staging areas are weed free, and travel through weed infested areas is avoided or minimized. Examples of prevention actions to be followed during project activities include cleaning all equipment and clothing before entering the project site; avoiding soil disturbance and the creation of other

soil conditions that promote weed germination and establishment; and using weed-free seed, hay, mulch, gravel, soil, and mineral materials on public lands where there is a state or county program in place.

Conditions that enhance invasive species abundance should be addressed when developing mitigation and prevention plans for activities on public lands. These conditions include excessive disturbance associated with road maintenance, poor grazing management, and high levels of recreational use. If livestock grazing is managed to maintain the vigor of native perennial plants, particularly grasses, the chance of weeds invading rangeland is much less. By carefully managing recreational use and educating the public on the potential impacts of recreational activities on vegetation, the amount of damage to native vegetation and soil can be minimized at high use areas, such as campgrounds and off-highway vehicle (OHV) trails. Early detection in recreation areas is focused on roads and trails, where much of the weed spread occurs.

The BLM participates in the National Early Warning and Rapid Response System for Invasive Plants (Figure B-1). The goal of this System to minimize the establishment and spread of new invasive species through a coordinated framework of public and private processes by:

- Early detection and reporting of suspected new plant species to appropriate officials;
- Identification and vouchering of submitted specimens by designated specialists;
- Verification of suspected new state, regional, and national plant records;
- Archival of new records in designated regional and plant databases;
- Rapid assessment of confirmed new records; and
- Rapid response to verified new infestations that are determined to be invasive.

Herbicide Treatment Planning

BLM Manual 9011 (*Chemical Pest Control*) outlines the policies, and BLM Handbook H-9011-1 (*Chemical Pest Control*) outlines the procedures, for use of herbicides on public lands. As part of policy, the BLM is required to thoroughly evaluate the need for chemical treatments and their potential for impact on the environment. The BLM is required to use only U.S. Environmental Protection Agency (USEPA)-registered herbicides that have been properly evaluated under National Environmental Policy Act (NEPA), and to carefully follow label directions and additional BLM requirements.

An operational plan is developed and updated for each herbicide project. The plan includes information on project specifications, key personnel responsibilities, and communication, safety, spill response, and emergency procedures. For application of herbicides not approved for aquatic use, the plan should also specify minimum buffer widths between treatment areas and water bodies. Recommended widths are provided in BLM Handbook H-9011-1 (*Chemical Pest Control*), but actual buffers are site and herbicide active ingredient specific, and are determined based on a scientific analysis of environmental factors, such as climate, topography, vegetation, and weather; timing and method of application; and herbicide risks to humans and non-target species. Table B-2 summarizes important SOPs that should be used when applying herbicides to help protect resources of concern on public lands.

Revegetation

Disturbed areas may be reseeded or planted with desirable vegetation when the native plant community cannot recover and occupy the site sufficiently.

Determining the need for revegetation is an integral part of developing a vegetation treatment. The most important component of the process is determining whether active (seeding/planting) or passive (natural recovery) revegetation is appropriate.

U.S. Department of the Interior policy states, “Natural recovery by native plant species is preferable to planting or seeding, either of natives or non-natives. However, planting or seeding should be used only if necessary to prevent unacceptable erosion or resist competition from non-native invasive species” (620 Departmental Memorandum 3 2004). This policy is reiterated in the USDI *Burned Area Emergency Stabilization and Rehabilitation* Manual, the BLM *Burned Area Emergency Stabilization and Rehabilitation* Manual (BLM H-1742-1), and the *Interagency Burned Area Rehabilitation Guidebook*.

TABLE B-1
Prevention Measures

BLM Activity	Prevention Measure
Project Planning	• Incorporate prevention measures into project layout and design, alternative evaluation, and project decisions to prevent the introduction or spread of weeds. • Determine prevention and maintenance needs, including the use of herbicides, at the onset of project planning. • Before ground-disturbing activities begin, inventory weed infestations and prioritize areas for treatment in project operating areas and along access routes. • Remove sources of weed seed and propagules to prevent the spread of existing weeds and new weed infestations. • Pre-treat high-risk sites for weed establishment and spread before implementing projects. • Post weed awareness messages and prevention practices at strategic locations such as trailheads, roads, boat launches, and public land kiosks. • Coordinate project activities with nearby herbicide applications to maximize the cost-effectiveness of weed treatments.
Project Development	• Minimize soil disturbance to the extent practical, consistent with project objectives. • Avoid creating soil conditions that promote weed germination and establishment. • To prevent weed germination and establishment, retain native vegetation in and around project activity areas and keep soil disturbance to a minimum, consistent with project objectives. • Locate and use weed-free project staging areas. Avoid or minimize all types of travel through weed-infested areas, or restrict travel to periods when the spread of seeds or propagules is least likely. • Prevent the introduction and spread of weeds caused by moving weed-infested sand, gravel, borrow, and fill material. • Inspect material sources on site, and ensure that they are weed-free before use and transport. Treat weed-infested sources to eradicate weed seed and plant parts, and strip and stockpile contaminated material before any use of pit material. • Survey the area where material from treated weed-infested sources is used for at least 3 years after project completion to ensure that any weeds transported to the site are promptly detected and controlled. • Prevent weed establishment by not driving through weed-infested areas. • Inspect and document weed establishment at access roads, cleaning sites, and all disturbed areas; control infestations to prevent weed spread within the project area. • Avoid acquiring water for dust abatement where access to the water is through weed-infested sites. • Identify sites where equipment can be cleaned. Clean equipment before entering public lands. • Clean all equipment before leaving the project site if operating in areas infested with weeds. • Inspect and treat weeds that establish at equipment cleaning sites. • Ensure that rental equipment is free of weed seed. • Inspect, remove, and properly dispose of weed seed and plant parts found on workers' clothing and equipment. Proper disposal entails bagging the seeds and plant parts and incinerating them.
Revegetation	• Include weed prevention measures, including project inspection and documentation, in operation and reclamation plans. • Retain bonds until reclamation requirements, including weed treatments, are completed, based on inspection and documentation. • To prevent conditions favoring weed establishment, reestablish vegetation on bare ground caused by project disturbance as soon as possible using either natural recovery or artificial techniques. • Maintain stockpiled, uninfested material in a weed-free condition.

TABLE B-1 (Cont.)
Prevention Measures

BLM Activity	Prevention Measure
Revegetation (Cont.)	• Revegetate disturbed soil (except travel ways on surfaced projects) in a manner that optimizes plant establishment for each specific project site. For each project, define what constitutes disturbed soil and objectives for plant cover revegetation. Revegetation may include topsoil replacement, planting, seeding, fertilization, liming, and weed-free mulching, as necessary. • Where practical, stockpile weed-seed-free topsoil and replace it on disturbed areas (e.g., road embankments or landings). • Inspect seed and straw mulch to be used for site rehabilitation (for wattles, straw bales, dams, etc.) and certify that they are free of weed seed and propagules. • Inspect and document all limited term ground-disturbing operations in noxious weed infested areas for at least 3 growing seasons following completion of the project. • Use native material where appropriate and feasible. Use certified weed-free or weed-seed-free hay or straw where certified materials are required and/or are reasonably available. • Provide briefings that identify operational practices to reduce weed spread (for example, avoiding known weed infestation areas when locating fire lines). • Evaluate options, including closure, to regulate the flow of traffic on sites where desired vegetation needs to be established. Sites could include road and trail rights-of-way (ROW), and other areas of disturbed soils.

In addition to these handbooks and policy, use of native and non-native seed in revegetation and restoration is guided by BLM Manual 1745 (*Introduction, Transplant, Augmentation and Reestablishment of Fish, Wildlife and Plants).* This manual states that native species shall be used, unless it is determined through the NEPA process that: 1) suitable native species are not available; 2) the natural biological diversity of the proposed management area will not be diminished; 3) exotic and naturalized species can be confined within the proposed management area; 4) analysis of ecological site inventory information indicates that a site will not support reestablishment of a species that historically was part of the natural environment; or 5) resource management objectives cannot be met with native species.

When natural recovery is not feasible, revegetation can be used to stabilize and restore vegetation on disturbed sites and to eliminate or reduce the conditions that favor invasive species. Reseeding or replanting may be required when there is insufficient vegetation or seed stores to naturally revegetate the site.

To ensure revegetation success, there must be adequate soil for root development and moisture storage, which provides moisture to support the new plants. Chances for revegetation success are improved by selecting seed with high purity and percentage germination; selecting native species or cultivars adapted to the area; planting at proper depth, seeding rate, and time of the year for the region; choosing the appropriate planting method; and, where feasible, removing competing vegetation. Planting mixtures are adapted for the treatment area and site uses. A combination of forbs, perennial grasses, and shrubs is typically used on rangeland sites, while shrubs and trees might be favored for riparian and forestland sites. A mixture of several native plant species and types or functional groups enhances the value of the site for fish and wildlife and improves the health and aesthetic character of the site. Mixtures can better take advantage of variable soil, terrain, and climatic conditions, and thus are more likely to withstand insect infestations and survive adverse climatic conditions.

The USDI BLM Native Seed program was developed in response to Congressional direction to supply native plant material for emergency stabilization and longer-term rehabilitation and restoration efforts. The focus of the program is to increase the number of native plant species for which seed is available and the total amount of native seed available for these efforts. To date, the program has focused on native plant material needs of emergency stabilization and burned area rehabilitation in the Great Basin, but is expanding to focus on areas such as western Oregon, the Colorado Plateau, and most recently the Mojave Desert. The Wildland Fire Management Program funds and manages the effort.

The National Seed Warehouse is a storage facility for the native seed supply. Through a Memorandum of

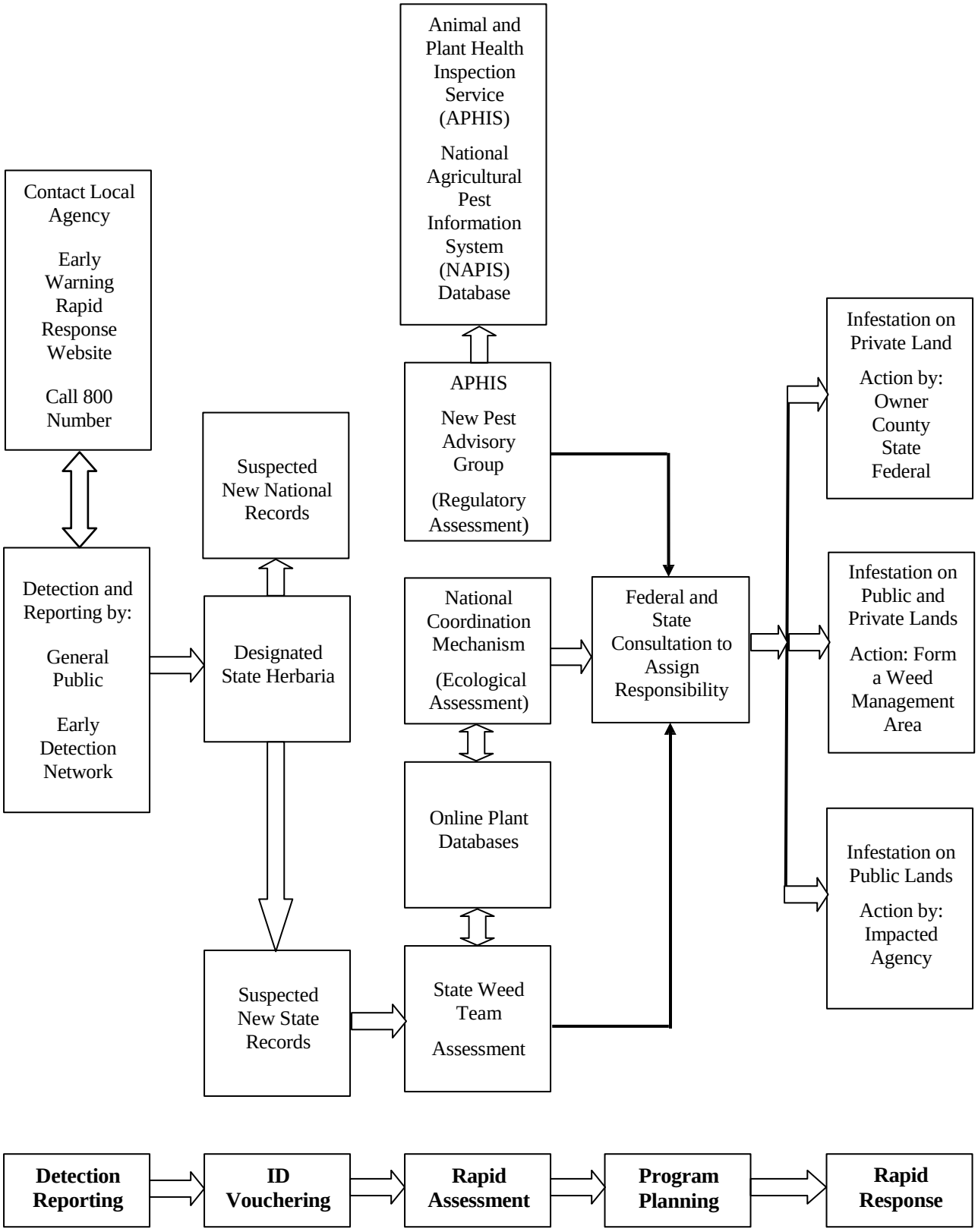


Figure B-1. National Early Warning and Rapid Response System for Invasive Plants.

Understanding with the BLM Idaho State Director, each state (Idaho, Oregon, Nevada, Utah and Colorado) can reserve an annual seed supply for purchase based on a reasonable projection of annual acreage to be stabilized or rehabilitated over a 5-year period.

The Great Basin Restoration Initiative (GBRI) grew out of concern for the health of the Great Basin after the wildfires of 1999. The goal of GBRI is to implement treatments and strategies to maintain functioning ecosystems and to proactively restore degraded ones at strategic locations. Native plants are emphasized in restoration projects where their use is practical and the potential for success is satisfactory. Monitoring is recommended to measure treatment success. To increase the availability of native plants, especially native forbs, the GBRI has established a collaborative native plant project, the Great Basin Native Plant Selection and Increase Project, to increase native plant availability and the technology to successfully establish these plants. This project is supported by funding from the BLM's Native Plant Initiative.

The BLM will follow the following SOPs when revegetating sites:

- Cultivate previously disturbed sites to reduce the amount of weed seeds in the soil seedbank.
- Revegetate sites once work is completed or soon after a disturbance.
- When available, use native seed of known origin as labeled by state seed certification programs.
- Use seed of non-native cultivars and species only when locally adapted native seed is not available or when it is unlikely to establish quickly enough to prevent soil erosion or weed establishment.
- Use seed that is free of noxious and invasive weeds, as determined and documented by a seed inspection test by a certified seed laboratory.
- Limit nitrogen fertilizer applications that favor annual grass growth over forb growth in newly seeded areas, especially where downy brome (cheatgrass) and other invasive annuals are establishing.
- Use clean equipment, free of plants and plant parts, on revegetation projects to prevent the inadvertent introduction of weeds into the site.
- Where important pollinator resources exist, include native nectar and pollen producing plants in the seed mixes used in restoration and reclamation projects. Include non-forage plant species in seed mixes for their pollinator/host relationships as foraging, nesting, or shelter species. Choose native plant species over manipulated cultivars, especially of forbs and shrubs, since natives tend to have more valuable pollen and nectar resources than cultivars. Ensure that bloom times for the flowers of the species chosen match the activity times for the pollinators. Maintain sufficient litter on the soil surfaces of native plant communities for ground-nesting bees.
- Where feasible, avoid grazing by domestic and wild animals on treatment sites until vegetation is well established. Where total rest from grazing is not feasible, efforts should be made to modify the amount and/or season of grazing to promote vegetation recovery within the treatment area. Reductions in grazing animal numbers, permanent or temporary fencing, changes in grazing rotation, and identification of alternative forage sources are examples of methods that could be used to remove, reduce or modify grazing impacts during vegetation recovery.

Special Precautions

Special Status Species

Federal policies and procedures for protecting federally-listed threatened and endangered plant and animal species, and species proposed for listing, were established by the Endangered Species Act of 1973 and regulations issued pursuant to the Act. The purposes of the Act are to provide mechanisms for the conservation of threatened and endangered species and their habitats. Under the Act, the Secretary of the Interior is required to determine which species are threatened or endangered and to issue recovery plans for those species.

Section 7 of the Act specifically requires all federal agencies to use their authorities in furtherance of the Act to carry out programs for the conservation of listed

species, and to ensure that no agency action is likely to jeopardize the continued existence of a listed species or adversely modify critical habitat. Policy and guidance (BLM Manual 6840; *Special Status Species*) also stipulates that species proposed for listing must be managed at the same level of protection as listed species.

The BLM state directors may designate special status in cooperation with their respective state. These special status species must receive, at a minimum, the same level of protection as federal candidate species. The BLM will also carry out management for the conservation of state-listed species, and state laws protecting these species will apply to all BLM programs and actions to the extent that they are consistent with Federal Land Policy and Management Act (FLPMA) and other federal laws.

The BLM consulted with the U.S. Fish and Wildlife Service (UFWS) and National Marine Fisheries Service (NMFS) during development of the *Final Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* (PEIS) as required under Section 7 of the Endangered Species Act. As part of this process, the BLM prepared a formal consultation package that included a description of the program; species listed as threatened or endangered, species proposed for listing, and critical habitats that could be affected by the program; and a Biological Assessment (BA) that evaluated the likely impacts to listed species, species proposed for listing, and critical habitats from the proposed vegetation treatment program. Over 300 species were evaluated in the BA. The BA also provides broad guidance at a programmatic level for actions that will be taken by the BLM to avoid adversely impacting species or critical habitat.

Before any vegetation treatment or ground disturbance occurs, BLM policy requires a survey of the project site for species listed or proposed for listing, or special status species. This is done by a qualified biologist and/or botanist who consults the state and local databases and visits the site at the appropriate season. If a proposed project may affect a proposed or listed species or its critical habitat, the BLM consults with the USFWS and/or NMFS. A project with a "may affect, likely to adversely affect" determination requires formal consultation and receives a Biological Opinion from the USFWS and/or NMFS. A project with a "may affect, not likely to adversely affect" determination requires informal consultation and receives a concurrence letter from USFWS and/or NMFS, unless that action is implemented under the authorities of the alternative consultation agreement pursuant to counterpart regulations established for *National Fire Plan* projects.

Wilderness Areas

Wilderness areas, which are designated by Congress, are defined by the Wilderness Act of 1964 as places "where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain." The BLM manages 175 Wilderness Areas encompassing over 7.2 million acres.

Activities allowed in wilderness areas are identified in wilderness management plans prepared by the BLM. The BLM does not ordinarily treat vegetation in wilderness areas, but will control invasive and noxious weeds when they threaten lands outside wilderness area or are spreading within the wilderness and can be controlled without serious adverse impacts to wilderness values.

Management of vegetation in a wilderness area is directed toward retaining the natural character of the environment. Tree and shrub removal is usually not allowed, except for fire, insect, or disease control. Reforestation is generally prohibited except to repair damage caused by humans in areas where natural reforestation is unlikely. Only native species and primitive methods, such as hand planting, are allowed for reforestation.

Tools and equipment may be used for vegetation management when they are the minimum amount necessary for the protection of the wilderness resource. Motorized tools may only be used in special or emergency cases involving the health and safety of wilderness visitors, or the protection of wilderness values.

Habitat manipulation using mechanical or chemical means may be allowed to protect threatened and endangered species and to correct unnatural conditions, such as weed infestations, resulting from human influence.

The BLM also manages a total of 610 Wilderness Study Areas (WSAs) encompassing nearly 14.3 million acres. These are areas that have been determined to have wilderness characteristics worthy of consideration for wilderness designation. The BLM's primary goals in WSAs are to manage them so as to not impair their wilderness values and to maintain their suitability for

preservation as wilderness until Congress makes a determination on their future.

In WSAs, the BLM must foster a natural distribution of native species of plants and animals by ensuring that ecosystems and processes continue to function naturally.

Cultural Resources

The effects of BLM actions on cultural resources are addressed through compliance with the National Historic Preservation Act, as implemented through a national Programmatic Agreement (*Programmatic Agreement among the Bureau of Land Management, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers Regarding the Manner in Which BLM Will Meet Its Responsibilities Under the National Historic Preservation Act*) and state-specific protocol agreements with State Historic Preservation Officers (SHPOs). The BLM's responsibilities under these authorities are addressed as early in the vegetation management project planning process as possible.

The BLM meets its responsibilities for consultation and government-to-government relationships with Native American tribes by consulting with appropriate tribal representatives prior to taking actions that affect tribal interests. The BLM's tribal consultation policies are detailed in BLM Manual 8120 (*Tribal Consultation Under Cultural Resource Authorities)* and Handbook H-8120-1 (*Guidelines for Conducting Tribal Consultation).* The BLM consulted with Native American tribes and Alaska Native groups during development of the PEIS. Information gathered on important tribal resources and potential impacts to these resources from herbicide treatments is presented in the analysis of impacts.

When conducting vegetation treatments, field office personnel consult with relevant parties (including tribes, native groups, and SHPOs), assess the potential of the proposed treatment to affect cultural and subsistence resources, and devise inventory and protection strategies suitable to the types of resources present and the potential impacts to them.

Herbicide treatments, for example, are unlikely to affect buried cultural resources, but might have a negative effect on traditional cultural properties comprised of plant foods or materials significant to local tribes and native groups. These treatments require inventory and protection strategies that reflect the different potential of each treatment to affect various types of cultural resources.

Impacts to significant cultural resources are avoided through project redesign or are mitigated through data recovery, recordation, monitoring, or other appropriate measures. When cultural resources are discovered during vegetation treatment, appropriate actions are taken to protect these resources.

TABLE B-2
Standard Operating Procedures for Applying Herbicides

Resource Element	Standard Operating Procedure
Guidance Documents	BLM Handbook H-9011-1 (*Chemical Pest Control*); and manuals 1112 (*Safety*), 9011 (*Chemical Pest Control*), 9012 (*Expenditure of Rangeland Insect Pest Control Funds*), 9015 (*Integrated Weed Management)*, and 9220 (*Integrated Pest Management*).
General	• Prepare operational and spill contingency plan in advance of treatment. • Conduct a pretreatment survey before applying herbicides. • Select herbicide that is least damaging to the environment while providing the desired results. • Select herbicide products carefully to minimize additional impacts from degradates, adjuvants, inert ingredients, and tank mixtures. • Apply the least amount of herbicide needed to achieve the desired result. • Follow herbicide product label for use and storage. • Have licensed applicators apply herbicides. • Use only USEPA-approved herbicides and follow product label directions and "advisory" statements. • Review, understand, and conform to the "Environmental Hazards" section on the herbicide product label. This section warns of known pesticide risks to the environment and provides practical ways to avoid harm to organisms or to the environment. • Consider surrounding land use before assigning aerial spraying as a treatment method and avoid aerial spraying near agricultural or densely populated areas. • Minimize the size of application area, when feasible. • Comply with herbicide-free buffer zones to ensure that drift will not affect crops or nearby residents/landowners. • Post treated areas and specify reentry or rest times, if appropriate. • Notify adjacent landowners prior to treatment. • Keep a copy of Material Safety Data Sheets (MSDSs) at work sites. MSDSs are available for review at http://www.cdms.net/. • Keep records of each application, including the active ingredient, formulation, application rate, date, time, and location. • Avoid accidental direct spray and spill conditions to minimize risks to resources. • Consider surrounding land uses before aerial spraying. • Avoid aerial spraying during periods of adverse weather conditions (snow or rain imminent, fog, or air turbulence). • Make helicopter applications at a target airspeed of 40 to 50 miles per hour (mph), and at about 30 to 45 feet above ground. • Take precautions to minimize drift by not applying herbicides when winds exceed >10 mph (>6 mph for aerial applications), or a serious rainfall event is imminent. • Use drift control agents and low volatile formulations. • Conduct pre-treatment surveys for sensitive habitat and special status species within or adjacent to proposed treatment areas. • Consider site characteristics, environmental conditions, and application equipment in order to minimize damage to non-target vegetation. • Use drift reduction agents, as appropriate, to reduce the drift hazard to non-target species. • Turn off applied treatments at the completion of spray runs and during turns to start another spray run. • Refer to the herbicide product label when planning revegetation to ensure that subsequent vegetation would not be injured following application of the herbicide. • Clean OHVs to remove seeds.

TABLE B-2 (Cont.)
Standard Operating Procedures for Applying Pesticides

Resource Element	Standard Operating Procedure
Air Quality See Manual 7000 (*Soil, Water, and Air Management*)	• Consider the effects of wind, humidity, temperature inversions, and heavy rainfall on herbicide effectiveness and risks. • Apply herbicides in favorable weather conditions to minimize drift. For example, do not treat when winds exceed 10 mph (>6 mph for aerial applications) or rainfall is imminent. • Use drift reduction agents, as appropriate, to reduce the drift hazard. • Select proper application equipment (e.g., spray equipment that produces 200- to 800-micron diameter droplets [spray droplets of 100 microns and less are most prone to drift]). • Select proper application methods (e.g., set maximum spray heights, use appropriate buffer distances between spray sites and non-target resources).
Soil See Manual 7000 (*Soil, Water, and Air Management*)	• Minimize treatments in areas where herbicide runoff is likely, such as steep slopes when heavy rainfall is expected. • Minimize use of herbicides that have high soil mobility, particularly in areas where soil properties increase the potential for mobility. • Do not apply granular herbicides on slopes of more than 15% where there is the possibility of runoff carrying the granules into non-target areas.
Water Resources See Manual 7000 (*Soil, Water, and Air Management*)	• Consider climate, soil type, slope, and vegetation type when developing herbicide treatment programs. • Select herbicide products to minimize impacts to water. This is especially important for application scenarios that involve risk from active ingredients in a particular herbicide, as predicted by risk assessments. • Use local historical weather data to choose the month of treatment. Considering the phenology of the target species, schedule treatments based on the condition of the water body and existing water quality conditions. • Plan to treat between weather fronts (calms) and at appropriate time of day to avoid high winds that increase water movements, and to avoid potential stormwater runoff and water turbidity. • Review hydrogeologic maps of proposed treatment areas. Note depths to groundwater and areas of shallow groundwater and areas of surface water and groundwater interaction. Minimize treating areas with high risk for groundwater contamination. • Conduct mixing and loading operations in an area where an accidental spill would not contaminate an aquatic body. • Do not rinse spray tanks in or near water bodies. Do not broadcast pellets where there is danger of contaminating water supplies. • Maintain buffers between treatment areas and water bodies. Buffer widths should be developed based on herbicide- and site-specific criteria to minimize impacts to water bodies. • Minimize the potential effects to surface water quality and quantity by stabilizing terrestrial areas as quickly as possible following treatment.
Wetlands and Riparian Areas	• Use a selective herbicide and a wick or backpack sprayer. • Use appropriate herbicide-free buffer zones for herbicides not labeled for aquatic use based on risk assessment guidance, with minimum widths of 100 feet for aerial, 25 feet for vehicle, and 10 feet for hand spray applications.
Vegetation See Handbook H-4410-1 (*National Range Handbook*), and manuals 5000 (*Forest Management*) and 9015 (*Integrated Weed Management*)	• Refer to the herbicide label when planning revegetation to ensure that subsequent vegetation would not be injured following application of the herbicide. • Use native or sterile species for revegetation and restoration projects to compete with invasive species until desired vegetation establishes. • Use weed-free feed for horses and pack animals. Use weed-free straw and mulch for revegetation and other activities. • Identify and implement any temporary domestic livestock grazing and/or supplemental feeding restrictions needed to enhance desirable vegetation recovery following treatment. Consider adjustments in the existing grazing permit, to maintain desirable vegetation on the treatment site.

TABLE B-2 (Cont.)
Standard Operating Procedures for Applying Pesticides

Resource Element	Standard Operating Procedure
Pollinators	• Complete vegetation treatments seasonally before pollinator foraging plants bloom. • Time vegetation treatments to take place when foraging pollinators are least active both seasonally and daily. • Design vegetation treatment projects so that nectar and pollen sources for important pollinators and resources are treated in patches rather than in one single treatment. • Minimize herbicide application rates. Use typical rather than maximum rates where there are important pollinator resources. • Maintain herbicide free buffer zones around patches of important pollinator nectar and pollen sources. • Maintain herbicide free buffer zones around patches of important pollinator nesting habitat and hibernacula. • Make special note of pollinators that have single host plant species, and minimize herbicide spraying on those plants (if invasive species) and in their habitats.
Fish and Other Aquatic Organisms See manuals 6500 (*Wildlife and Fisheries Management*) and 6780 (*Habitat Management Plans*)	• Use appropriate buffer zones based on label and risk assessment guidance. • Minimize treatments near fish-bearing water bodies during periods when fish are in life stages most sensitive to the herbicide(s) used, and use spot rather than broadcast or aerial treatments. • Use appropriate application equipment/method near water bodies if the potential for off-site drift exists. • For treatment of aquatic vegetation, 1) treat only that portion of the aquatic system necessary to achieve acceptable vegetation management, 2) use the appropriate application method to minimize the potential for injury to desirable vegetation and aquatic organisms, and 3) follow water use restrictions presented on the herbicide label.
Wildlife See manuals 6500 (*Wildlife and Fisheries Management*) and 6780 (*Habitat Management Plans*)	• Use herbicides of low toxicity to wildlife, where feasible. • Use spot applications or low-boom broadcast operations where possible to limit the probability of contaminating non-target food and water sources, especially non-target vegetation over areas larger than the treatment area. • Use timing restrictions (e.g., do not treat during critical wildlife breeding or staging periods) to minimize impacts to wildlife.
Threatened, Endangered, and Sensitive Species See Manual 6840 (*Special Status Species*)	• Survey for special status species before treating an area. Consider effects to special status species when designing herbicide treatment programs. • Use a selective herbicide and a wick or backpack sprayer to minimize risks to special status plants. • Avoid treating vegetation during time-sensitive periods (e.g., nesting and migration, sensitive life stages) for special status species in area to be treated.
Livestock See Handbook H-4120-1 (*Grazing Management*)	• Whenever possible and whenever needed, schedule treatments when livestock are not present in the treatment area. Design treatments to take advantage of normal livestock grazing rest periods, when possible. • As directed by the herbicide product label, remove livestock from treatment sites prior to herbicide application, where applicable. • Use herbicides of low toxicity to livestock, where feasible. • Take into account the different types of application equipment and methods, where possible, to reduce the probability of contamination of non-target food and water sources. • Avoid use of diquat in riparian pasture while pasture is being used by livestock. • Notify permittees of the herbicide treatment project to improve coordination and avoid potential conflicts and safety concerns during implementation of the treatment. • Notify permittees of livestock grazing, feeding, or slaughter restrictions, if necessary. • Provide alternative forage sites for livestock, if possible.

TABLE B-2 (Cont.)
Standard Operating Procedures for Applying Pesticides

Resource Element	Standard Operating Procedure
Wild Horses and Burros	• Minimize using herbicides in areas grazed by wild horses and burros. • Use herbicides of low toxicity to wild horses and burros, where feasible. • Remove wild horses and burros from identified treatment areas prior to herbicide application, in accordance with herbicide product label directions for livestock. • Take into account the different types of application equipment and methods, where possible, to reduce the probability of contaminating non-target food and water sources.
Cultural Resources and Paleontological Resources See handbooks H-8120-1 (*Guidelines for Conducting Tribal Consultation*) and H-8270-1 (*General Procedural Guidance for Paleontological Resource Management*), and manuals 8100 (*The Foundations for Managing Cultural Resources*), 8120 (*Tribal Consultation Under Cultural Resource Authorities*), and 8270 (*Paleontological Resource Management*) See also: *Programmatic Agreement among the Bureau of Land Management, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers Regarding the Manner in Which BLM Will Meet Its Responsibilities Under the National Historic Preservation Act*	• Follow standard procedures for compliance with Section 106 of the National Historic Preservation Act as implemented through the *Programmatic Agreement among the Bureau of Land Management, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers Regarding the Manner in Which BLM Will Meet Its Responsibilities Under the National Historic Preservation Act* and state protocols or 36 Code of Federal Regulations Part 800, including necessary consultations with State Historic Preservation Officers and interested tribes. • Follow BLM Handbook H-8270-1 (*General Procedural Guidance for Paleontological Resource Management*) to determine known Condition I and Condition 2 paleontological areas, or collect information through inventory to establish Condition 1 and Condition 2 areas, determine resource types at risk from the proposed treatment, and develop appropriate measures to minimize or mitigate adverse impacts. • Consult with tribes to locate any areas of vegetation that are of significance to the tribe and that might be affected by herbicide treatments. • Work with tribes to minimize impacts to these resources. • Follow guidance under Human Health and Safety in the PEIS in areas that may be visited by Native peoples after treatments.
Visual Resources See handbooks H-8410-1 (*Visual Resource Inventory*) and H-8431-1 (*Visual Resource Contrast Rating*), and manual 8400 (*Visual Resource Management*)	• Minimize the use of broadcast foliar applications in sensitive watersheds to avoid creating large areas of browned vegetation. • Consider the surrounding land use before assigning aerial spraying as an application method. • Minimize off-site drift and mobility of herbicides (e.g., do not treat when winds exceed 10 mph; minimize treatment in areas where herbicide runoff is likely; establish appropriate buffer widths between treatment areas and residences) to contain visual changes to the intended treatment area. • If the area is a Class I or II visual resource, ensure that the change to the characteristic landscape is low and does not attract attention (Class I), or if seen, does not attract the attention of the casual viewer (Class II). • Lessen visual impacts by: 1) designing projects to blend in with topographic forms; 2) leaving some low-growing trees or planting some low-growing tree seedlings adjacent to the treatment area to screen short-term effects; and 3) revegetating the site following treatment. • When restoring treated areas, design activities to repeat the form, line, color, and texture of the natural landscape character conditions to meet established Visual Resource Management (VRM) objectives.

TABLE B-2 (Cont.)
Standard Operating Procedures for Applying Pesticides

Resource Element	Standard Operating Procedure
Wilderness and Other Special Areas See handbooks H-8550-1 (*Management of Wilderness Study Areas (WSAs)*), and H-*Designated Wilderness Study Areas*), and Manual 8351 (*Wild and Scenic Rivers*)	• Encourage backcountry pack and saddle stock users to feed their livestock only weed-free feed for several days before entering a wilderness area. • Encourage stock users to tie and/or hold stock in such a way as to minimize soil disturbance and loss of native vegetation. • Revegetate disturbed sites with native species if there is no reasonable expectation of natural regeneration. • Provide educational materials at trailheads and other wilderness entry points to educate the public on the need to prevent the spread of weeds. • Use the "minimum tool" to treat noxious and invasive vegetation, relying primarily on the use of ground-based tools, including backpack pumps, hand sprayers, and pumps mounted on pack and saddle stock. • Use chemicals only when they are the minimum method necessary to control weeds that are spreading within the wilderness or threaten lands outside the wilderness. • Give preference to herbicides that have the least impact on non-target species and the wilderness environment. • Implement herbicide treatments during periods of low human use, where feasible. • Address wilderness and special areas in management plans. • Maintain adequate buffers for Wild and Scenic Rivers (¼ mile on either side of river, ½ mile in Alaska).
Recreation See Handbook H-1601-1 (*Land Use Planning Handbook, Appendix C*)	• Schedule treatments to avoid peak recreational use times, while taking into account the optimum management period for the targeted species. • Notify the public of treatment methods, hazards, times, and nearby alternative recreation areas. • Adhere to entry restrictions identified on the herbicide product label for public and worker access. • Post signs noting exclusion areas and the duration of exclusion, if necessary. • Use herbicides during periods of low human use, where feasible.
Social and Economic Values	• Consider surrounding land use before selecting aerial spraying as a method, and avoid aerial spraying near agricultural or densely-populated areas. • Post treated areas and specify reentry or rest times, if appropriate. • Notify grazing permittees of livestock feeding restrictions in treated areas, if necessary, as per herbicide product label instructions. • Notify the public of the project to improve coordination and avoid potential conflicts and safety concerns during implementation of the treatment. • Control public access until potential treatment hazards no longer exist, per herbicide product label instructions. • Observe restricted entry intervals specified by the herbicide product label. • Notify local emergency personnel of proposed treatments. • Use spot applications or low-boom broadcast applications where possible to limit the probability of contaminating non-target food and water sources, especially vegetation over areas larger than the treatment area. • Consult with Native American tribes and Alaska Native groups to locate any areas of vegetation that are of significance to the tribes and Native groups and that might be affected by herbicide treatments. • To the degree possible within the law, hire local contractors and workers to assist with herbicide application projects and purchase materials and supplies, including chemicals, for herbicide treatment projects through local suppliers. • To minimize fears based on lack of information, provide public educational information on the need for vegetation treatments and the use of herbicides in an integrated pest management program for projects proposing local use of herbicides.

TABLE B-2
(Cont.)
Standard Operating Procedures for Applying Pesticides

Resource Element	Standard Operating Procedure
Rights-of-way	• Coordinate vegetation management activities where joint or multiple use of a ROW exists. • Notify other public land users within or adjacent to the ROW proposed for treatment. • Use only herbicides that are approved for use in ROW areas.
Human Health and Safety	• Establish a buffer between treatment areas and human residences based on guidance given in the HHRA, with a minimum buffer of ¼ mile for aerial applications and 100 feet for ground applications, unless a written waiver is granted. • Use protective equipment as directed by the herbicide product label. • Post treated areas with appropriate signs at common public access areas. • Observe restricted entry intervals specified by the herbicide product label. • Provide public notification in newspapers or other media where the potential exists for public exposure. • Have a copy of MSDSs at work site. • Notify local emergency personnel of proposed treatments. • Contain and clean up spills and request help as needed. • Secure containers during transport. • Follow label directions for use and storage. • Dispose of unwanted herbicides promptly and correctly.

6.1.2 NRCS Sage-grouse Initiative

United States Department of Agriculture

Natural Resources Conservation Service

Introduction to NRCS' New Sage-Grouse Initiative:

Wildlife Conservation Through Sustainable Ranching

Photo ©John C. Carlson

SGI
Sage-Grouse Initiative

Helping People Help the Land

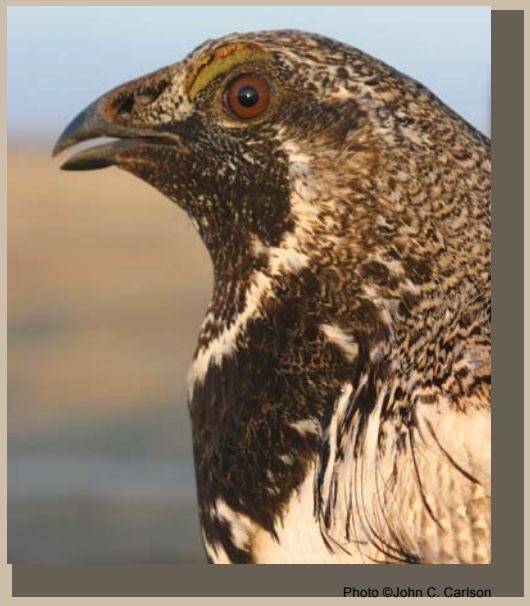


Photo ©John C. Carlson

In 2010, the United States Department of Agriculture (USDA) launched a new and exciting effort to sustain working ranches and conserve greater sage-grouse populations in the West. The Natural Resources Conservation Service (NRCS) is using popular conservation programs, including the Environmental Quality Incentives Program (EQIP) and the Wildlife Habitat Incentive Program (WHIP), to assist producers in 11 western States (California, Colorado, Idaho, Montana, Nevada, North Dakota, Oregon, South Dakota, Utah, Washington, and Wyoming) to simultaneously improve habitat for sage-grouse and improve sustainability and productivity of their native rangelands.

"USDA is taking bold steps to ensure the enhancement and preservation of sage-grouse habitat and the sustainability of working ranches in the western United States."

- USDA Secretary Tom Vilsack

Sage-Grouse Population Status

Sage-grouse, a ground-dwelling bird native to the sagebrush steppe ecosystem of the American West, is highly dependent on sagebrush for food and cover. These birds have experienced a significant decline in population over several decades. Approximately 40 percent of sage-grouse habitat that supports populations occurs on privately owned lands. This link with private lands makes NRCS uniquely positioned to focus agency resources to benefit sage-grouse, improve ranch sustainability, and maintain livestock grazing as the prevailing land use. Sage-grouse require a diverse mix of seasonal habitats throughout the year for nesting, brood-rearing, and over-wintering. Diverse habitat needs make sage-grouse an umbrella species. If managed sustainably, their habitats will also benefit other wildlife species.

The Link Between Sustainable Ranching and Sage-Grouse Conservation

SGI capitalizes on the strong link between conditions required to support sustainable ranching operations and habitat characteristics that support healthy sage-grouse populations. Several large-scale threats facing sage-grouse are identical to factors impacting the sustainability and productivity of grazing lands throughout the West. Fragmentation of sagebrush habitats from a variety of sources is the primary cause of the decline in sage-grouse populations. SGI aims to remove or reduce fragmentation threats common to sustainable ranching and sage-grouse conservation. Exotic species invasions, unsustainable grazing systems, sod-busting, subdivision, and conifer encroachment are examples of mutual threats.

What's Good for Rangelands Is Good for Grouse

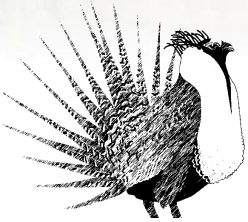
For the most part, the same factors that negatively affect sage-grouse also negatively affect the health, productivity, and sustainability of native grazing lands. Therefore, improvements to benefit sage-grouse also benefit grazing lands and the ranches that depend on them. Below are points of mutual interest shared by sage-grouse and livestock.

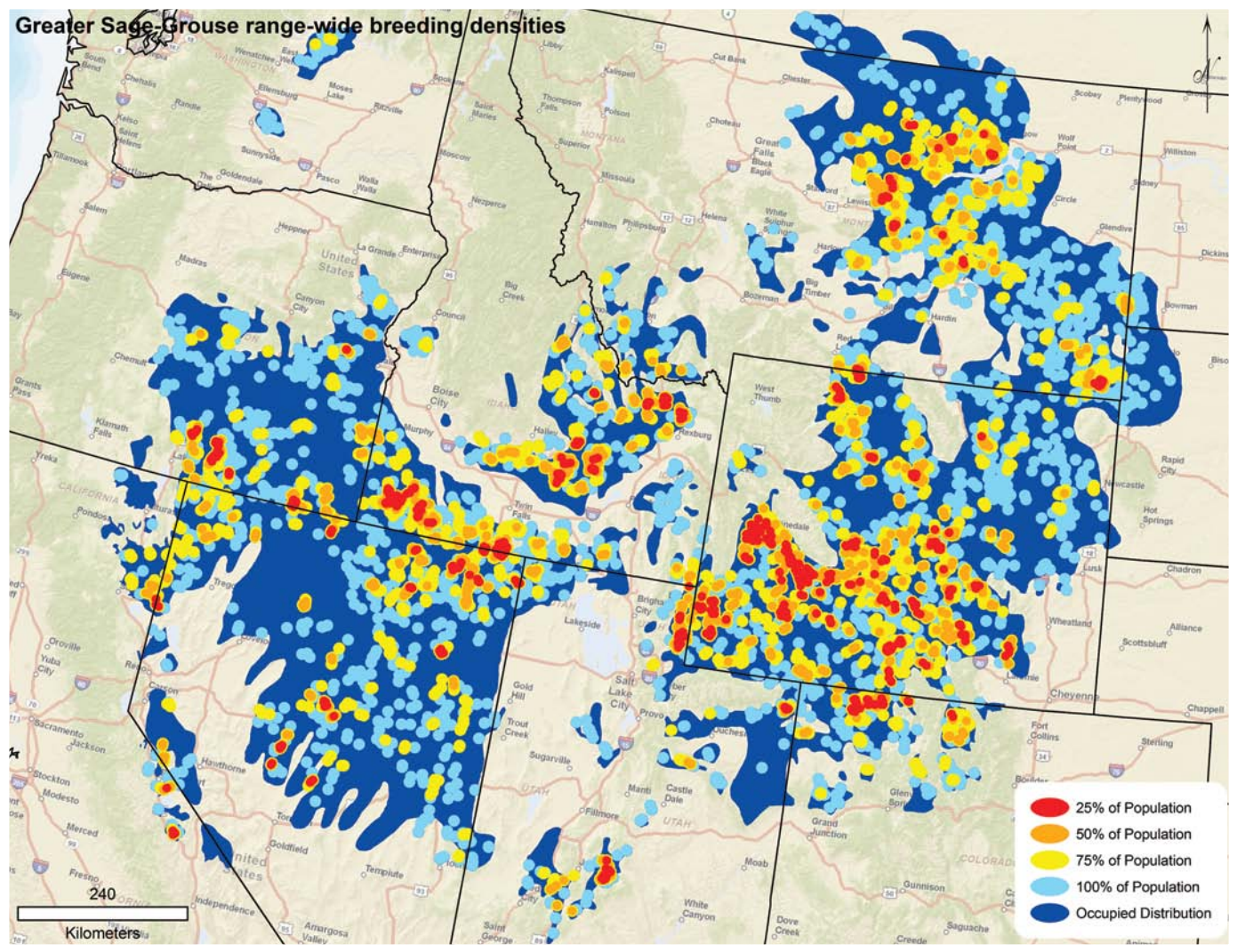
Beneficial for both

- Large and expansive tracts of rangeland
- Rangeland plant diversity
- Healthy rangeland
- A well-designed grazing plan
- Perennial native grass cover and forbs
- Weed and invasive species management
- Removal of encroaching conifer (primarily juniper/pine)
- Healthy, productive springs and seeps
- Unfragmented rangeland
- Productive sagebrush grassland with a healthy perennial grass understory

Negative for both

- Urbanization/subdivision
- Encroached conifer that reduces forage and deters bird use
- Overgrazing by livestock
- Human development including roads or power lines that fragment the range and spread weeds
- A dominance of club moss and blue grama
- Tanks that drown wildlife and foul stock water





Source: Bureau of Land Management

Map depicts sage-grouse population centers or "core areas" across the species range. Warmer colors indicate larger populations and are additive with red areas containing 25 percent of nesting birds, red combined with orange is 50 percent of birds (see legend).

Using Science To Achieve Results

A major goal is to strategically focus conservation in priority areas to maximize biological benefits to sage-grouse populations. NRCS has always implemented practices to enhance sustainability of grazing lands and sage-grouse populations. But past "opportunity-based" projects focused on individual ranches instead of targeting resources to multiple landowners in the same priority landscape to ameliorate threats to entire sage-grouse populations. With SGI, NRCS is delivering conservation in sage-grouse 'core areas' to help maintain large and intact grazing landscapes rather than try to maintain small declining populations at the cost of further loss in the best remaining areas. Sage-grouse core areas represent locations of high abundance population centers containing a majority of birds. Although sage-grouse occupy extremely large landscapes (186 million acres), their distribution is aggregated in comparably smaller identifiable core areas. A quarter of all sage-grouse live within 4 percent of the range (7 million acres), and 75 percent of birds are concentrated within 27 percent (50 million acres) of their world-wide distribution. Conservation priorities are widespread with each of 11 States containing at least 1 core with enough breeding birds to meet the 75 percent abundance threshold. By prioritizing and strategically focusing NRCS resources to range-wide core areas, benefits of conservation efforts for sage-grouse can be realized.

Identifying and marking fences where sage-grouse collisions are likely have been shown to reduce accidental mortality caused by fence strikes.

A century of fire suppression has enabled conifers to encroach into sagebrush communities, reducing habitat for both sage-grouse and domestic livestock.

Grazing systems increase cover for birds and forage availability for livestock.

Removing encroached conifers opens up habitat for sage-grouse and other wildlife and increases forage available for livestock.

Program Delivery

Conservation plans developed under SGI

employ conservation practices specifically designed to benefit sage-grouse populations and their habitats. Implementing SGI under the NRCS' Upland Wildlife Habitat Management ensures that a habitat evaluation is conducted and that limiting factors are reduced in order of their significance to populations. The purpose is to treat upland wildlife habitat issues identified during the conservation planning process to enable movement or to provide shelter, cover, and food in proper amounts, locations and times to sustain sage-grouse populations during a portion of their life cycle. Identifying the species' limiting factors at the level of the individual property owner is essential to ensure that the goals of the Conservation Practice Standard are met through SGI.

Partnering Across the West

NRCS structured SGI to be a collaborative effort

with its conservation partners across the West. Funding enhances the opportunity for USDA to strengthen its conservation commitment with State agencies responsible for managing sage-grouse populations. SGI facilitates landscape-level improvements across the species' range while recognizing that threats and opportunities differ among States and within core areas. Close collaboration with many stakeholders, including State, local and Federal agencies, tribes, and non-government organizations, ensures that NRCS activities complement efforts already underway. SGI fosters coordination and implementation on a range-wide scale while ensuring local input and control over actions in specific States. USDA also works with the U.S. Department of the Interior (DOI), Fish and Wildlife Service (FWS) to provide certainty to landowners who enroll in NRCS programs to benefit sage-grouse.

SGI and the Endangered Species Act (ESA)

SGI is equipped to help private landowners

respond proactively to a recent FWS decision that listing the species under ESA is "warranted but precluded." This designation means that the status of the species warrants protection under ESA, but that it is not yet listed because FWS is focused on other higher priority species. FWS decision not to list the species provides extra time to proactively implement conservation actions to preclude the need for listing. In August 2010, NRCS and FWS completed a Conference Report on sage-grouse conservation. This collaborative effort assessed conservation practices being implemented under SGI. FWS determined that implementation of NRCS practices and associated conservation measures will result in a positive response of sage-grouse populations. The conclusion also lets landowners know that should sage-grouse be listed at a future date, they can continue implementing those NRCS conservation practices and associated conservation measures designed to benefit the species within their NRCS conservation plan since those actions are in compliance with ESA.

Conferencing under Section 7 of the ESA assists a Federal agency in planning a proposed action to help conserve a species that is not yet listed under the ESA. The Conference Report was selected as the appropriate vehicle to meet partnership objectives to facilitate sage-grouse conservation while ensuring the sustainability of working farms and ranches in the West.

The Conference Report gives confidence to landowners who are implementing NRCS practices to restore and enhance sage-grouse habitat that those actions are in compliance with the Endangered Species Act if sage-grouse are listed as Threatened or Endangered.

Photo courtesy of Rebecca Smith, University of Montana

SGI informs FWS annual sage-grouse status reviews by reporting progress made through implementation of practices designed to benefit the species. NRCS is working to ensure that landowner contributions to sage-grouse conservation are accounted for in future listing decisions, with the hope of reducing the need to list the bird altogether.

NRCS Training for Effective Program Delivery

Training the NRCS and partner workforce on

sage-grouse life history needs, threats, and treatment options is a top priority for enhancing program delivery. NRCS delivered a 3-day classroom and in-field training to help staff in all 11 western States learn about how to best use SGI resources to benefit sage-grouse and working ranches. Nearly 500 NRCS conservationists and partners concurrently received the same 3 days of training. That included all NRCS technical staff located in counties where sage-grouse occur. Additional training will be a future and integrated part of SGI.

Monitoring Effectiveness

SGI includes science-based evaluations carried out by reputable, independent scientists

to measure the biological response of sage-grouse populations to conservation practices, to assess effectiveness, and to adaptively improve program delivery. Range-wide sage-grouse core areas have been mapped to refine SGI delivery ensuring practices benefit the largest number of birds. Now SGI-sponsored studies are underway in Montana and Oregon to assess benefits of grazing systems and removal of encroached conifers. The level of monitoring reflects the scales at which sage-grouse populations use habitat resources year-round and transcends that of an individual ranch to encompass multiple and nearby ranches enrolled in SGI. Rather than a focus on acres treated, the approach is biologically based and uses sage-grouse habitat and population responses at multiple scales to evaluate program benefits.

Photo ©John C. Carlson

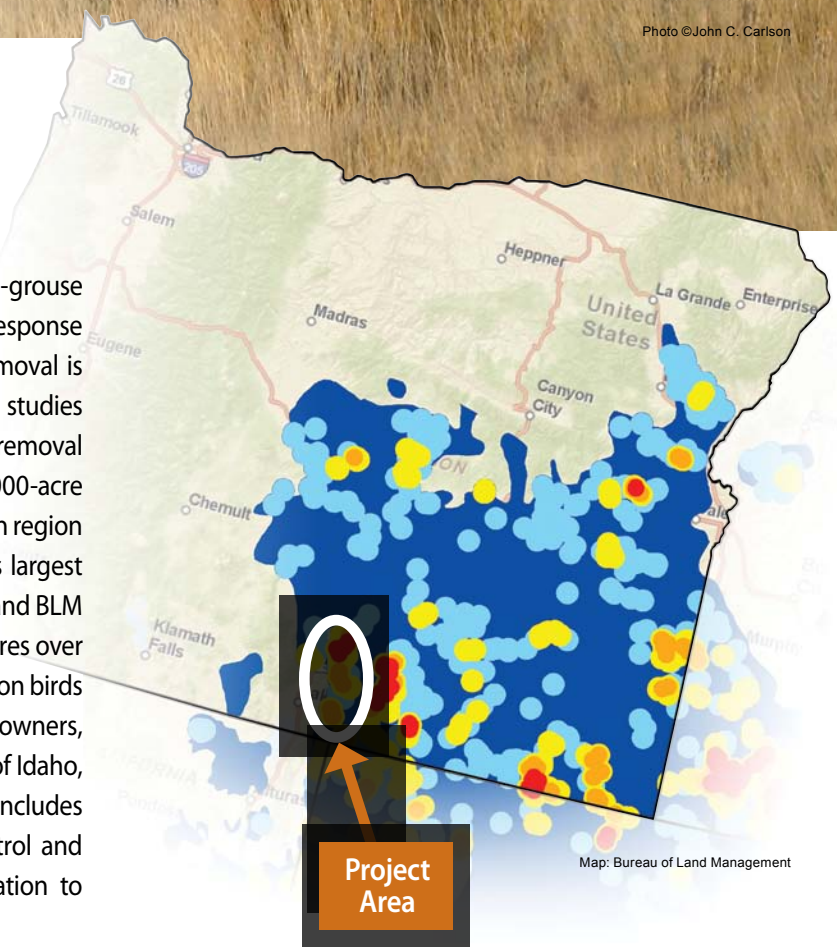
SGI research is conducted using birds fit with radio transmitters. This allows researchers to follow individual birds and measure changes in survival and reproduction that influence population growth.

Photo ©John C. Carlson

Monitoring - An Oregon Example

SGI in Oregon is reducing the fragmentation

threat of juniper encroachment in high-priority sage-grouse habitats. The monitoring goal is to evaluate sage-grouse response to removal of encroached juniper. Although juniper removal is widely assumed to produce benefits for sage-grouse, studies have yet to document a relationship between juniper removal and increased sage-grouse productivity. The 120,000-acre project area includes populations in the Warner Mountain region of south-central Oregon, a landscape within this State's largest remaining core area. Private landowners enrolled in SGI and BLM propose to remove post-settlement juniper on 27,000 acres over the next 5 years. Research to assess outcome of removal on birds is being conducted in coordination with private landowners, Oregon Department of Fish and Wildlife, the University of Idaho, and the Bureau of Land Management. Project design includes up to 2 years of pre-treatment telemetry data on control and treatment areas and 3 years of post-treatment evaluation to measure population response.



Map: Bureau of Land Management

Photo ©John C. Carlson

We can help

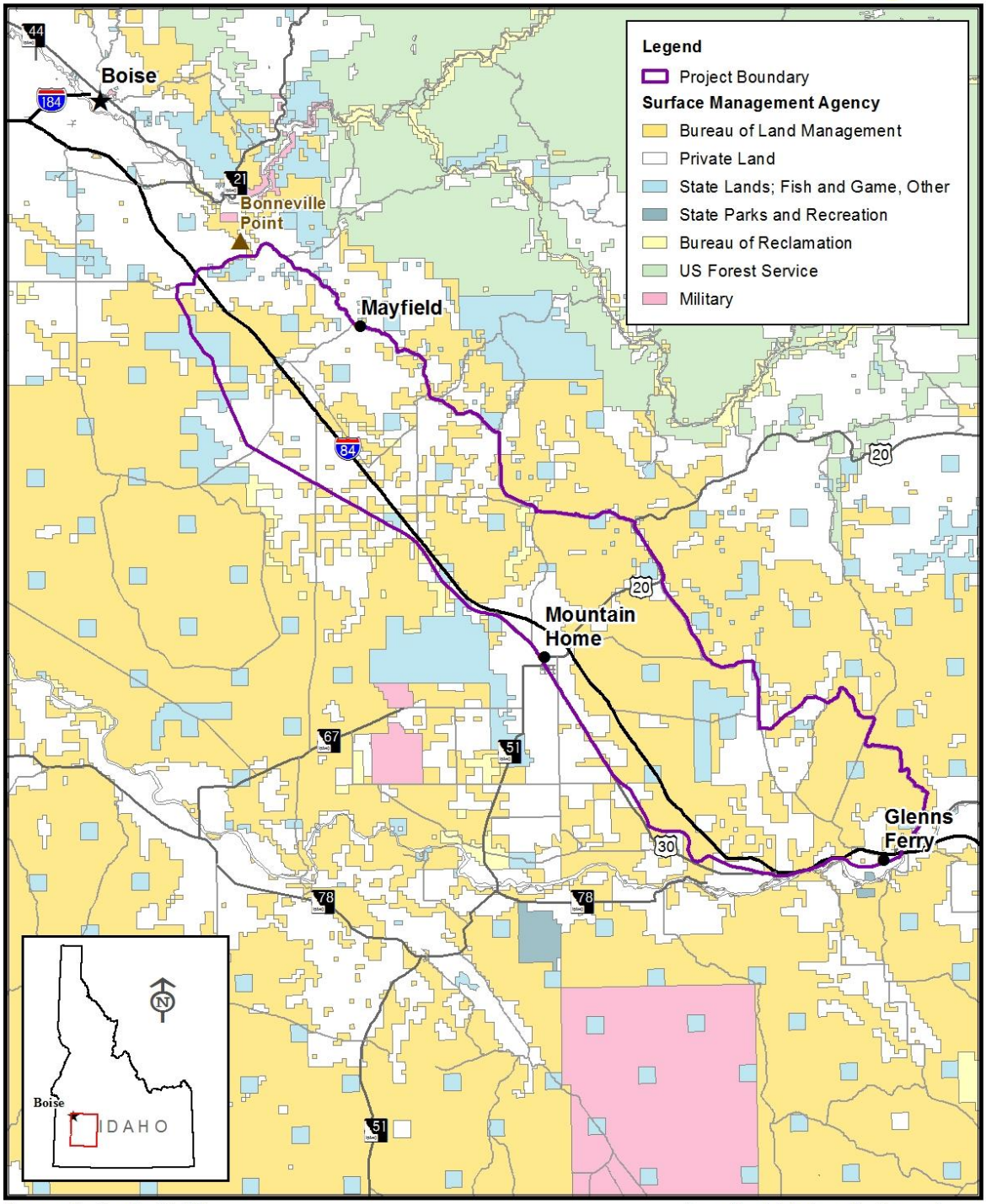
For more information on sage-grouse, contact your local NRCS office or visit the web at:
http://www.nrcs.usda.gov

PA - 2078 February 2011

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program (not all prohibited bases apply to all programs). Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

7.0 Maps

1. Vicinity Map

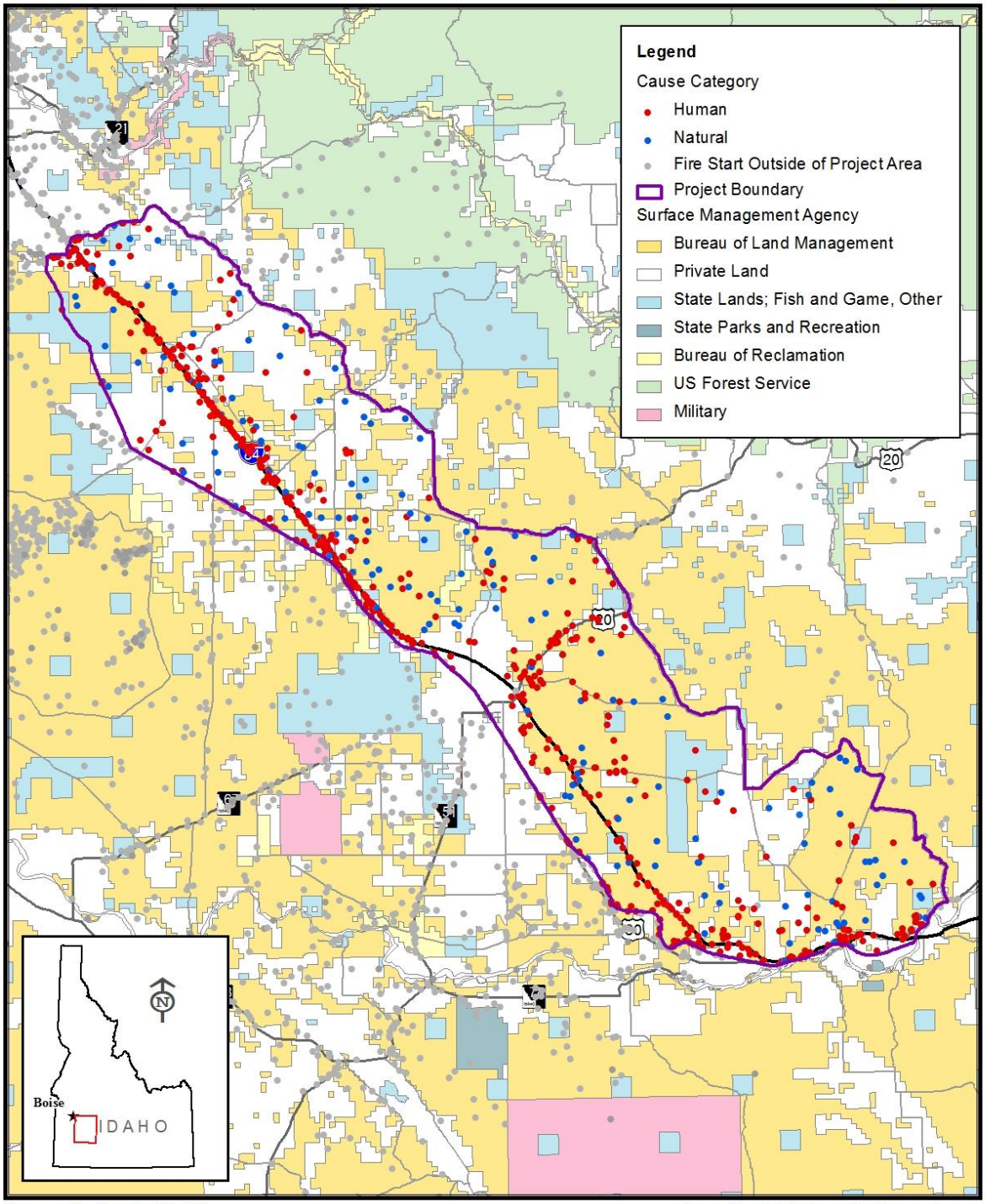


The sources of the data are from Idaho-BLM Corporate Data.
12/18/2013

0 5 10 20 Miles

No warranty is made by the Bureau of Land Management. The accuracy, reliability, or completeness of these data for individual use or aggregate use with other data is not guaranteed. The following (map) cannot be made Section 508 compliant. For help with its data or information, please contact the BLM Idaho State Office Webmaster at 208-373-4000

2. Fire Ignition History (1957 - 2012)

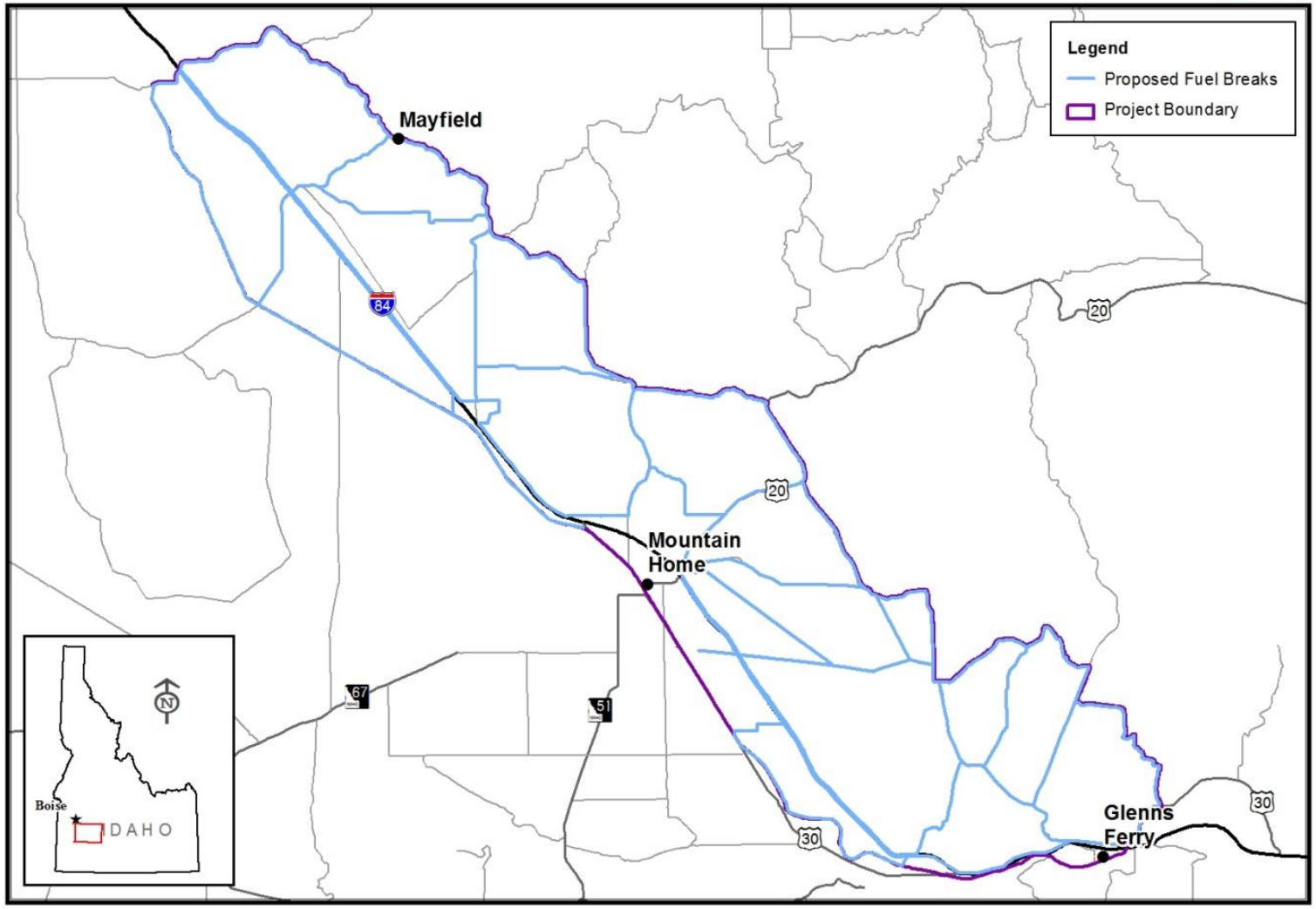


The sources of the data are from Idaho-BLM Corporate Data, and the USGS.
12/18/2013

0 4 8 16 Miles

No warranty is made by the Bureau of Land Management. The accuracy, reliability, or completeness of these date for individual use or aggregate use with other data is not guaranteed. The following (map) cannot be made Section 508 compliant. For help with its data or information, please contact the BLM Idaho State Office Webmaster at 208-373-4000

3. Alternative 2 - All Routes (Proposed Action)

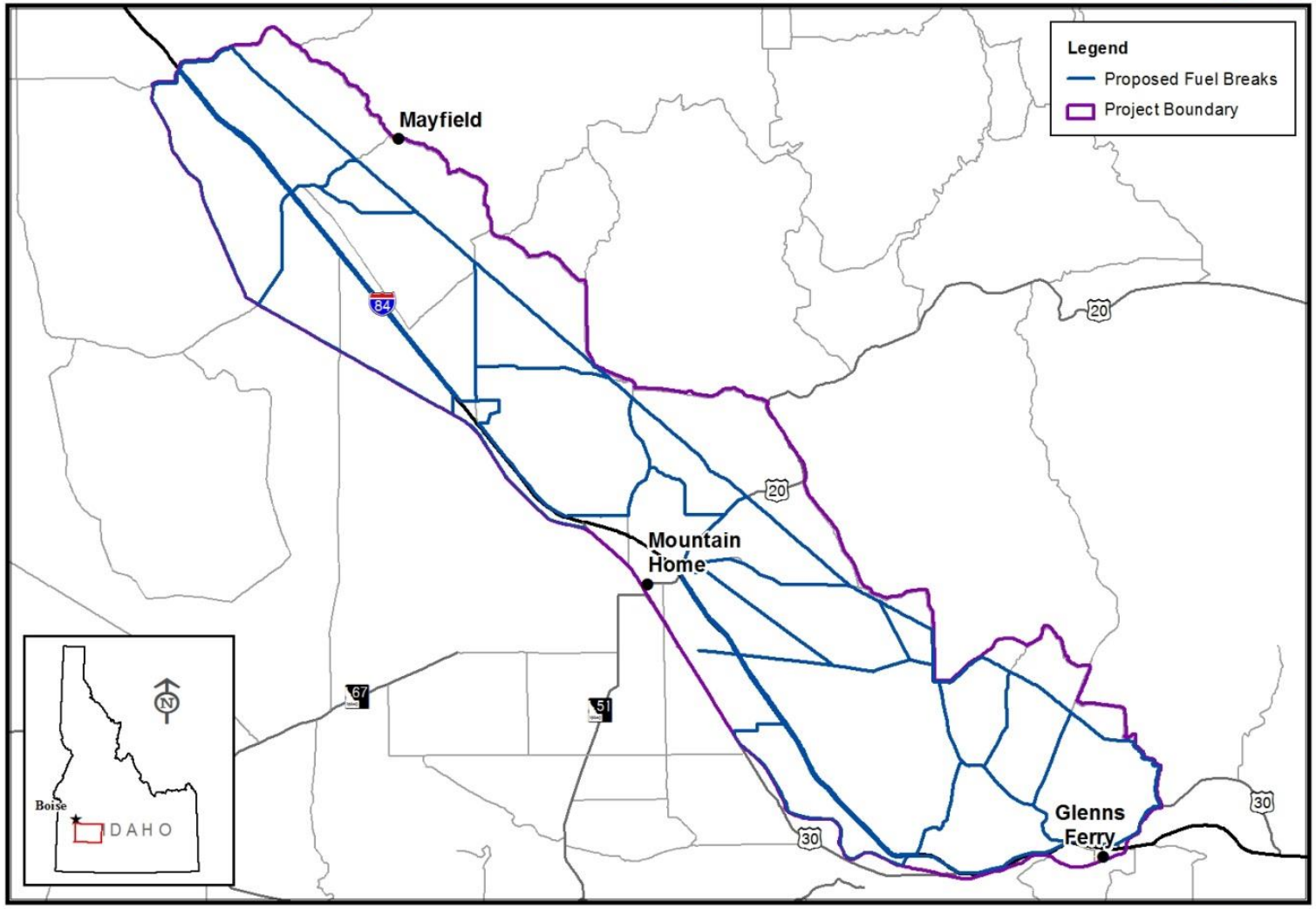


The sources of the data are from Idaho-BLM Corporate Data.
12/18/2013

0 5 10 15 Miles

No warranty is made by the Bureau of Land Management. The accuracy, reliability, or completeness of these date for individual use or aggregate use with other data is not guaranteed. The following (map) cannot be made Section 508 compliant. For help with its data or information, please contact the BLM Idaho State Office Webmaster at 208-373-4000

4. Alternative 3 - All Routes Excluding Mayfield Road

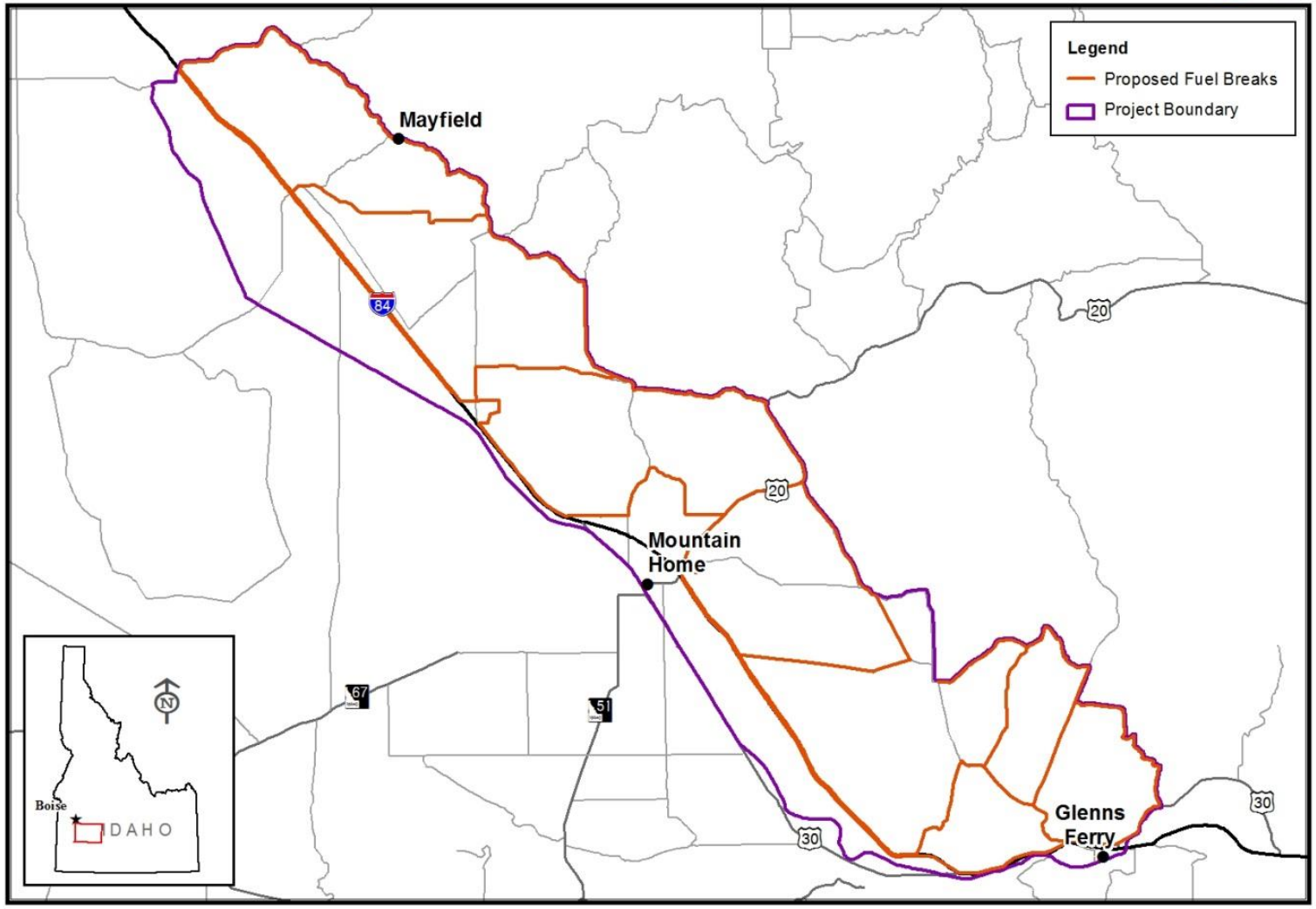


The sources of the data are from Idaho-BLM Corporate Data.
12/18/2013

0 5 10 15 Miles

No warranty is made by the Bureau of Land Management. The accuracy, reliability, or completeness of these date for individual use or aggregate use with other data is not guaranteed. The following (map) cannot be made Section 508 compliant. For help with its data or information, please contact the BLM Idaho State Office Webmaster at 208-373-4000

5. Alternative 4 - Reduced Routes

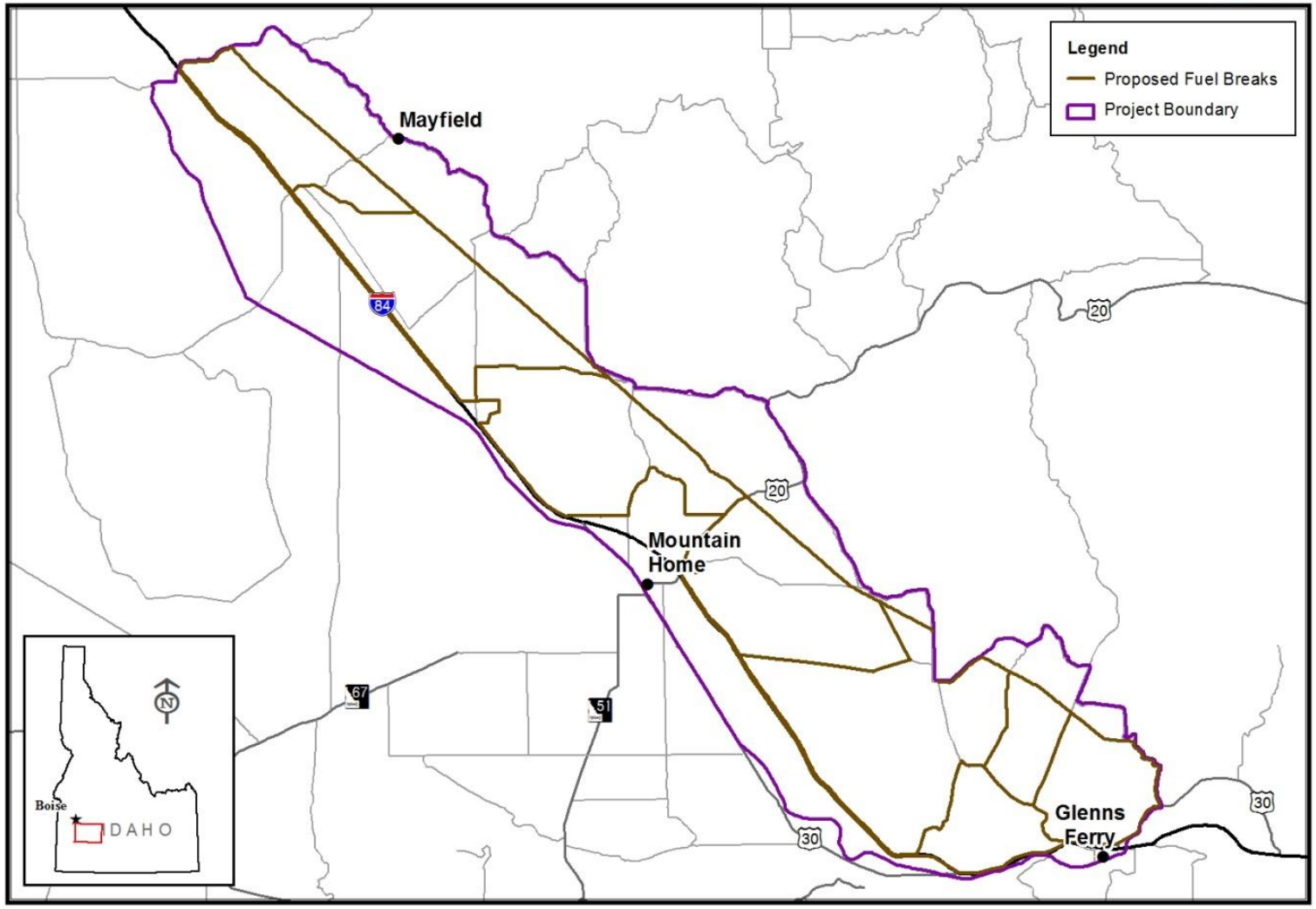


The sources of the data are from Idaho-BLM Corporate Data.
12/18/2013

0 5 10 15 Miles

No warranty is made by the Bureau of Land Management. The accuracy, reliability, or completeness of these date for individual use or aggregate use with other data is not guaranteed. The following (map) cannot be made Section 508 compliant. For help with its data or information, please contact the BLM Idaho State Office Webmaster at 208-373-4000

6. Alternative 5 - Reduced Routes Excluding Mayfield Road

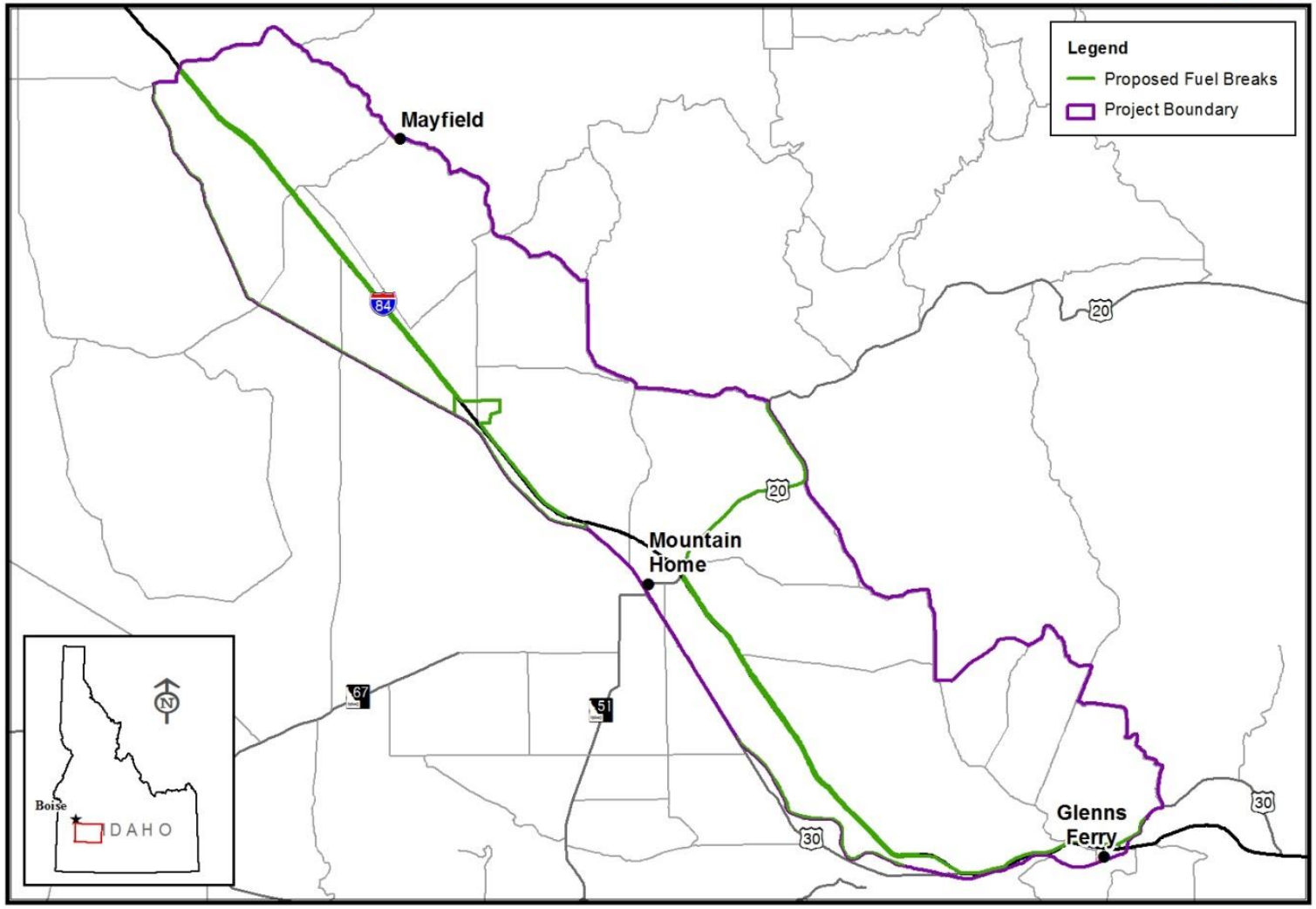


The sources of the data are from Idaho-BLM Corporate Data.
12/18/2013

0 5 10 15 Miles

No warranty is made by the Bureau of Land Management. The accuracy, reliability, or completeness of these date for individual use or aggregate use with other data is not guaranteed. The following (map) cannot be made Section 508 compliant. For help with its data or information, please contact the BLM Idaho State Office Webmaster at 208-373-4000

7. Alternative 6 - High Human Ignition Areas

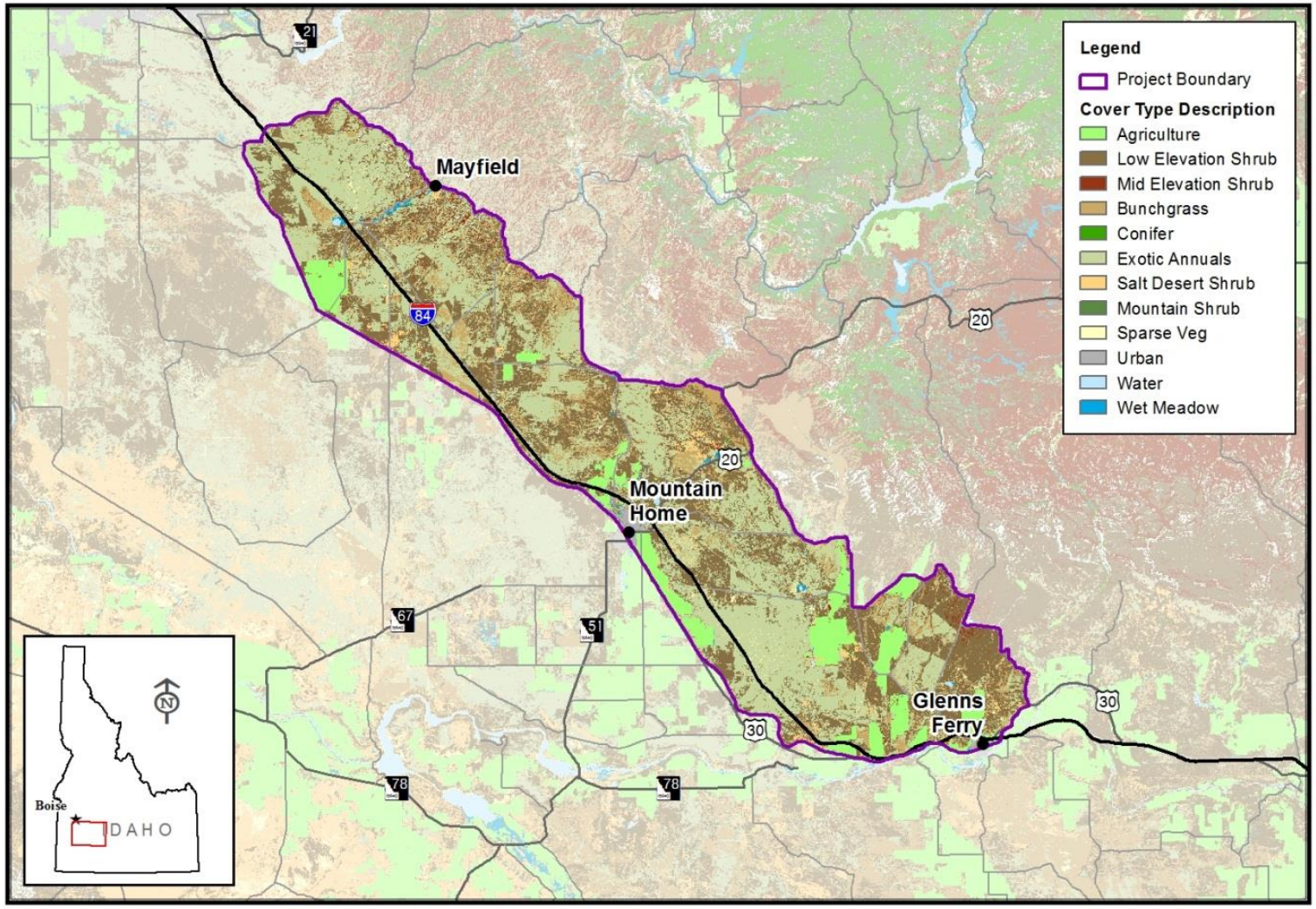


The sources of the data are from Idaho-BLM Corporate Data.
12/18/2013

0 5 10 15 Miles

No warranty is made by the Bureau of Land Management. The accuracy, reliability, or completeness of these date for individual use or aggregate use with other data is not guaranteed. The following (map) cannot be made Section 508 compliant. For help with its data or information, please contact the BLM Idaho State Office Webmaster at 208-373-4000

8. General Vegetation Cover Types

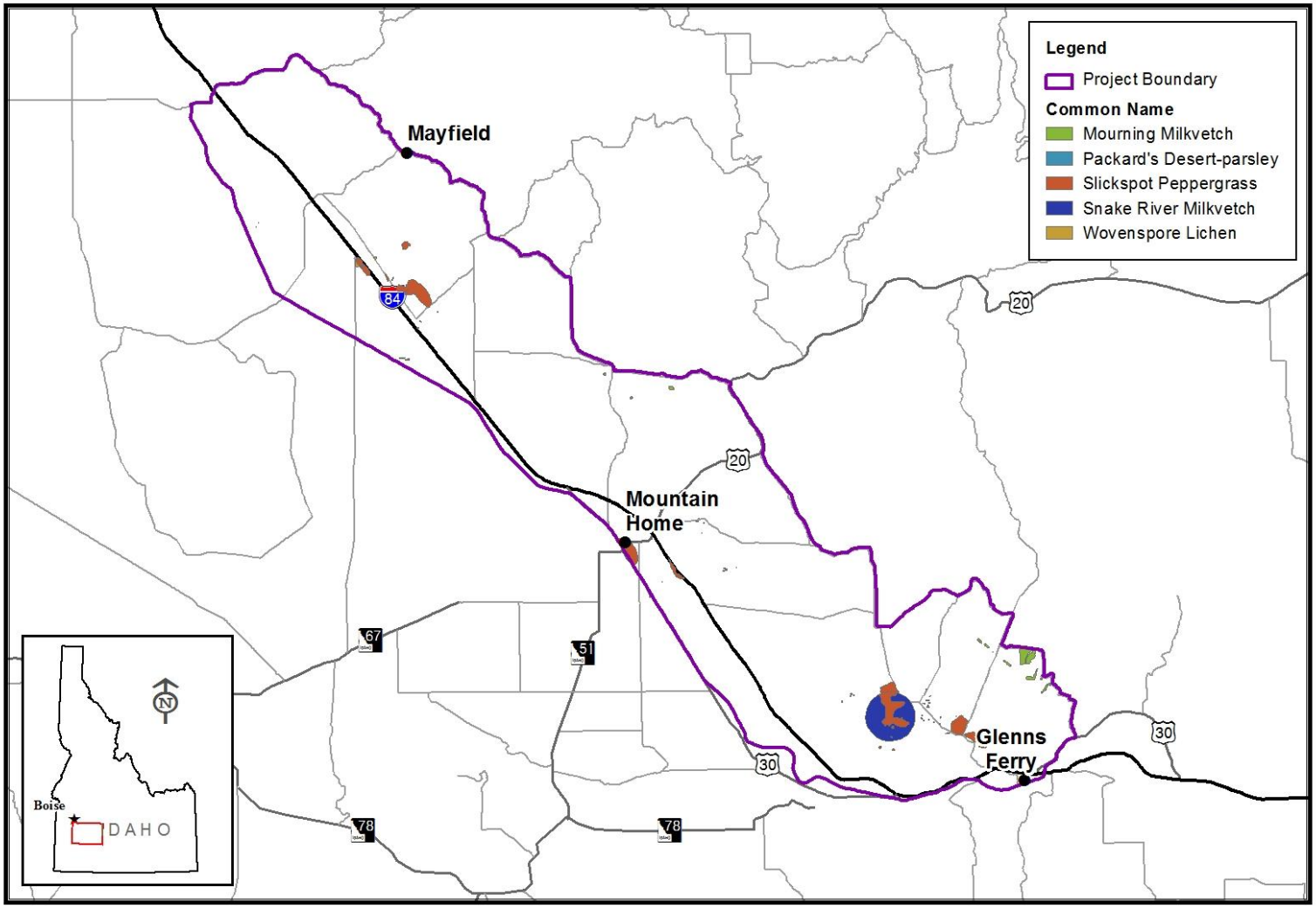


The sources of the data are from Idaho-BLM Corporate Data.
12/18/2013

0 5 10 20 Miles

No warranty is made by the Bureau of Land Management. The accuracy, reliability, or completeness of these date for individual use or aggregate use with other data is not guaranteed. The following (map) cannot be made Section 508 compliant. For help with its data or information, please contact the BLM Idaho State Office Webmaster at 208-373-4000

9. Special Status Plants within the Project Area

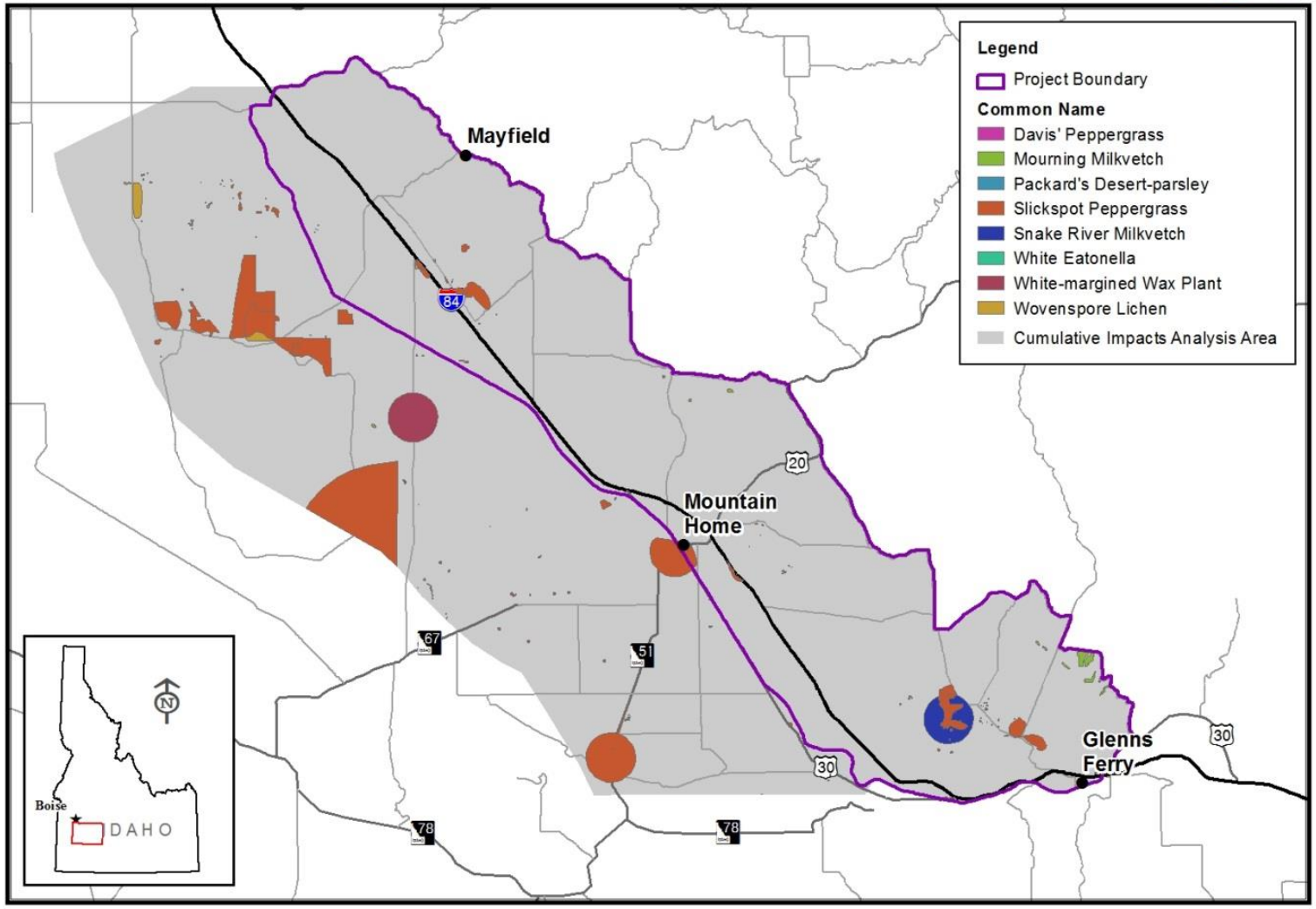


The sources of the data are from Idaho-BLM Corporate Data and Idaho State Fish & Game. 1/23/2014

0 5 10 20 Miles

No warranty is made by the Bureau of Land Management. The accuracy, reliability, or completeness of these date for individual use or aggregate use with other data is not guaranteed. The following (map) cannot be made Section 508 compliant. For help with its data or information, please contact the BLM Idaho State Office Webmaster at 208-373-4000

10. Special Status Plants within the Cumulative Impacts Analysis Area

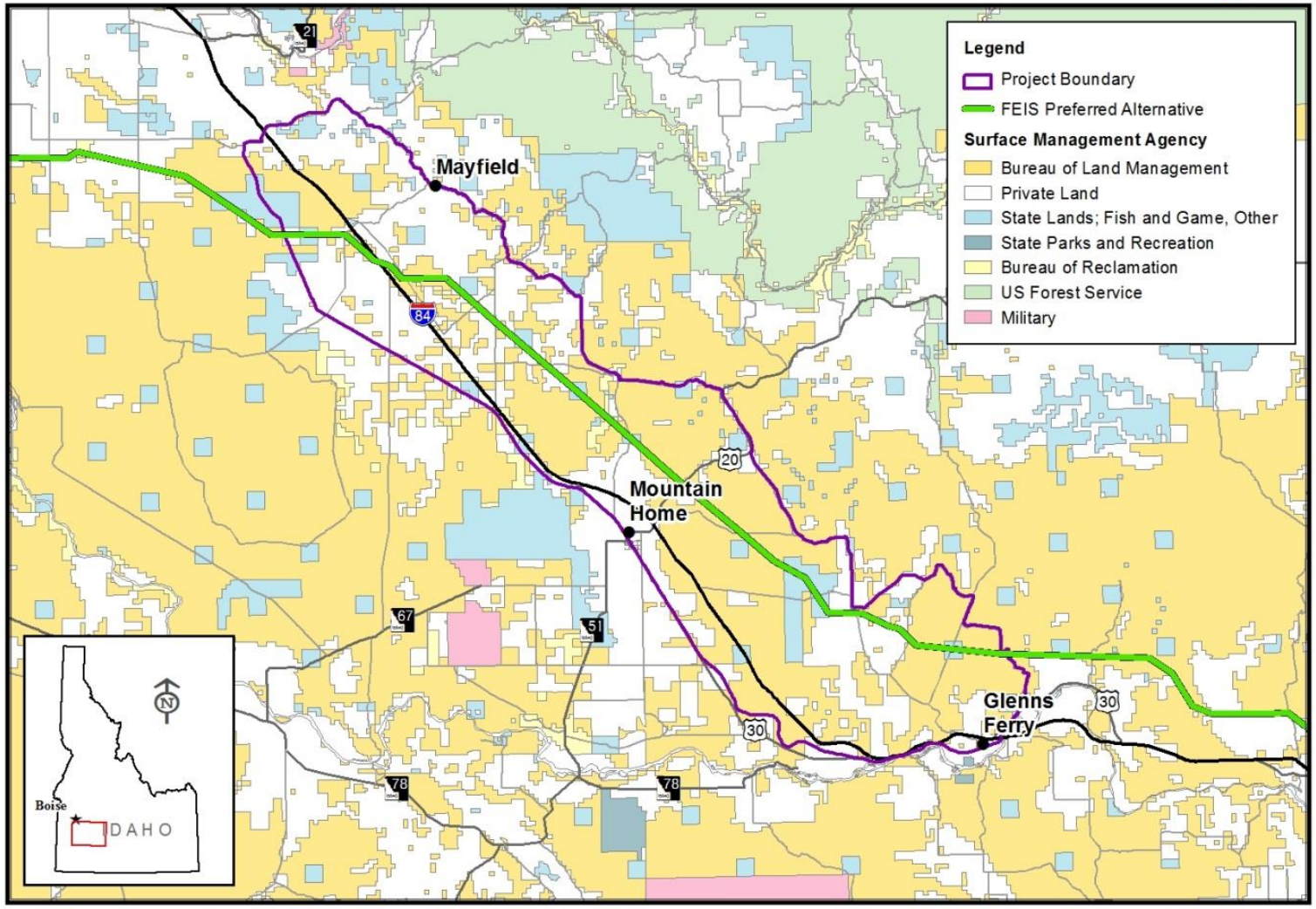


The sources of the data are from Idaho-BLM Corporate Data and Idaho State Fish & Game. 12/18/2013

0 5 10 20 Miles

No warranty is made by the Bureau of Land Management. The accuracy, reliability, or completeness of these date for individual use or aggregate use with other data is not guaranteed. The following (map) cannot be made Section 508 compliant. For help with its data or information, please contact the BLM Idaho State Office Webmaster at 208-373-4000

11. Preferred Route for Segment 8 Gateway West Transmission Line

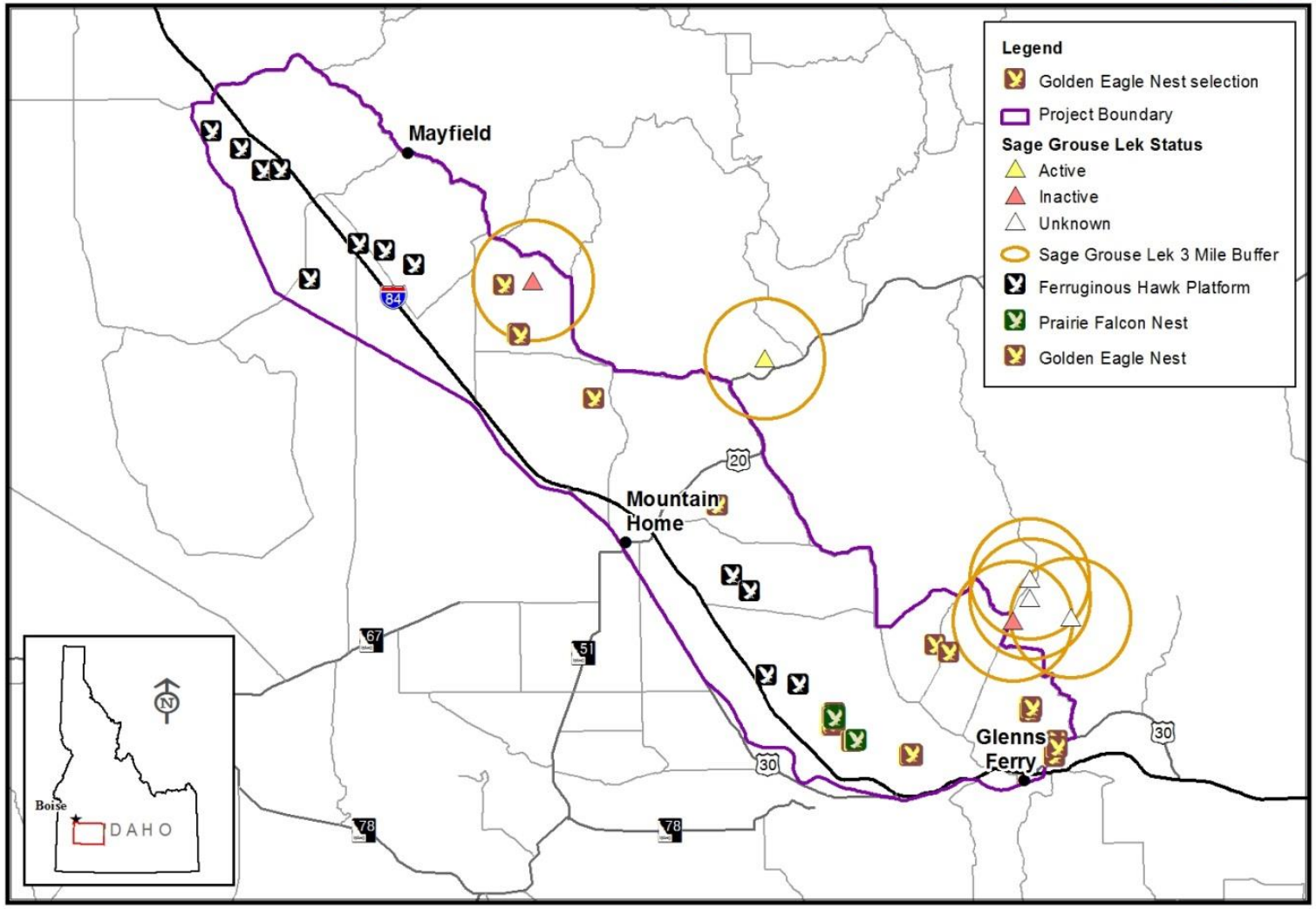


The sources of the data are from Idaho-BLM Corporate Data.
12/18/2013

0 5 10 20 Miles

No warranty is made by the Bureau of Land Management. The accuracy, reliability, or completeness of these date for individual use or aggregate use with other data is not guaranteed. The following (map) cannot be made Section 508 compliant. For help with its data or information, please contact the BLM Idaho State Office Webmaster at 208-373-4000

12. Greater Sage-grouse Leks and Sensitive Raptor Species Nest Sites

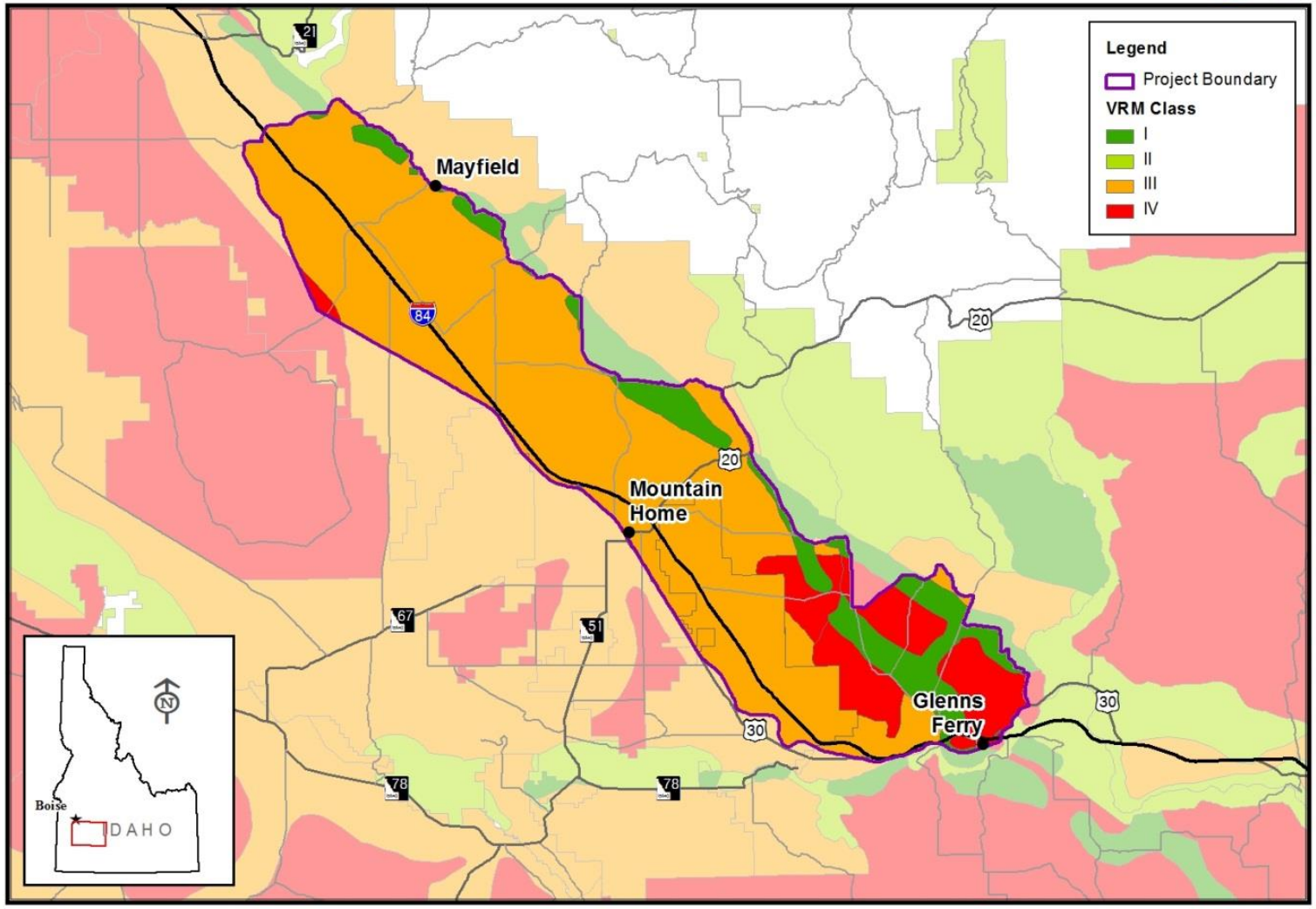


The sources of the data are from Idaho-BLM Corporate Data and Idaho State Fish & Game. 12/18/2013

0 5 10 20 Miles

No warranty is made by the Bureau of Land Management. The accuracy, reliability, or completeness of these date for individual use or aggregate use with other data is not guaranteed. The following (map) cannot be made Section 508 compliant. For help with its data or information, please contact the BLM Idaho State Office Webmaster at 208-373-4000

13. Visual Resource Management Classes



The sources of the data are from Idaho-BLM Corporate Data.
12/18/2013

0 5 10 20 Miles

No warranty is made by the Bureau of Land Management. The accuracy, reliability, or completeness of these date for individual use or aggregate use with other data is not guaranteed. The following (map) cannot be made Section 508 compliant. For help with its data or information, please contact the BLM Idaho State Office Webmaster at 208-373-4000