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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

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Paradigm Fuel Break Project

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1.0 Introduction

The proposed Paradigm project encompasses approximately 293,891 acres of federal, state, and private lands (Map 1). The western boundary of the project area is Blacks Creek Road (I-84) approximately 12 miles east of Boise. From Blacks Creek Road the project area includes everything 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).

Approximately 251,143 acres of the project area are within the FRFO boundary and 42,748 acres are within the Morley Nelson Snake River Birds of Prey National Conservation Area (NCA). BLM fire records show that approximately 78% of the 293,891 acres have burned at least once in the last 55 years (1957-2013) (Map 3). Since 1980, an estimated 647 ignitions within the project area developed into wildfires. Of those, 141 (22%) were lightning caused and 506 (78%) were human caused. These human caused ignitions are concentrated along transportation corridors, especially along I-84 (Map 2). During 2012, seven fires in and adjacent to the project area burned approximately 60,065 acres, including one that crossed the interstate.

There are several ranches and small communities in the area at risk from wildfire, including houses, outbuildings, and businesses on the periphery of Mountain Home. The BLM often must focus its fire suppression efforts around these areas. For instance, during the 2012 Benwalk fire, suppression crews ignited backfires in the vegetation adjacent to restaurants and hotel parking lots at the Mountain Home I-84 exit to protect the structures from advancing flames. Additionally, many of the groups that utilize public lands (e.g., ranchers, recreationists, etc.) have been impacted by the recurrence of wildfire within and around the project area.

Native rangeland in the project area was predominantly Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) with an array perennial grasses and forbs. However, since the late 1890s the Intermountain West has experienced an increase in invasive non-native annual grasses and forbs, such as cheatgrass (*Bromus tectorum*), medusahead (*Taeniatherum caput-medusae*), Russian thistle (*Salsola tragus*), and tall tumble mustard (*Sysimbrium altissimum*). These invasive annual plant species are now widely distributed across the project area and in some areas dominate the plant community. Conversion from sagebrush-steppe vegetation to invasive annual vegetation has degraded numerous acres of habitat for slickspot peppergrass, a plant proposed for listing under the Endangered Species Act (ESA) and greater sage-grouse (hereafter referred to as sage-grouse), a candidate for listing under the ESA.

Where invasive annual species dominate large-scale areas and ecosystem function has been altered to the point of transitioning to a new steady but depleted state (Chambers et al. 2013). Changes to an ecosystem from these invasive annual grasses and forbs can occur in just a few years. Once such a threshold has been crossed, conversion from the depleted state back to a native perennial shrub-steppe plant community is unlikely without human intervention, requiring money, time, and favorable weather patterns (precipitation). Invasive annual species rapidly fill available open spaces and provide an abundance of continuous fine fuel. Once established, these plants compete with native vegetation for water, nutrients, and space, invade and degrade sensitive plant and animal habitats, and increase wildfire frequency.

When Wyoming big sagebrush is burned, natural re-establishment can take between 20 to 50 years, and only occurs when an available seed source is nearby. Whisenant (1990) estimated historic fire return intervals for Wyoming big sagebrush communities to be between 60 to 110 years. An exponential increase in the density of invasive annual species is typical following a fire when these species occur within or near a burned area, 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 in cheatgrass dominated areas in the Boise District are commonly between five and ten years, and sometimes shorter.

1.1 Background

A symposium sponsored by the Boise District Resource Advisory Council (RAC) to address "how collaborative resource management can break the current fire cycle" was held in February 2011 in Boise, Idaho. The symposium was attended by representatives from multiple state and federal agencies, environmental organizations, academia, private landowners, public land 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 and restoring high value Wyoming big sagebrush habitats by reducing fire frequency. A steering committee was subsequently formed to work with government agencies and local interested parties to develop the tools to meet these goals. Following the symposium, the BLM identified the need to address the recurrence of wildfires, especially along the Interstate 84 corridor and surrounding areas between Glenns Ferry and Boise, Idaho.

1.1.1 Fire Behavior and Fuel Breaks

Priorities for fire suppression in order of importance are life, property, and natural resources. During multiple fire outbreaks, wildfires in areas distant from the wildland/urban interface (WUI) do not always receive sufficient suppression resources to extinguish the fire. Pro-active measures, such as fuel breaks, help to alleviate the amount of resources necessary to contain a fire in WUIs and allow more suppression forces to be allocated to protect life, property, and important habitat in outlying areas.

A fuel break is 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 fire spreading or crossing the strip or block of land (St John and Ogle 2009). The presence of bare interspaces between established individual plants enhances fuel break effectiveness. The National Wildfire Coordination Group (NWCG) defines fuel breaks as "a natural or manmade change in fuel characteristics which affects fire behavior so that fires burning into them can be more readily controlled" (NWCG 2012). Fuel breaks are not designed to stop or extinguish a fire under all conditions, but rather to reduce flame lengths, slow the spread of fast moving wildfire, and provide opportunities for firefighters to gain control of or contain a fire.

The following are characteristics of effective fuel breaks:

- Strategic – located in high fire-prone areas where they are readily accessible providing firefighters a tactical and safe area to establish anchor points for suppression actions

- Landscape level – developed to compartmentalize wildfires and tied into existing features such as roadways
- Timely – They are established and functional when needed, including late summer and early fall.
- Resilient and Low Maintenance – plants with a high moisture content to reduce fire spread, short-stature to limit flame length, community structure that promotes open interspaces, and the ability to re-sprout.
- Cost effective – implementation and maintenance costs should not limit ability to create effective treatments.

Fuel breaks are a valuable tool for wildland firefighters and have been used extensively in initial attack suppression. Often, existing roads, waterways, and trails are used as fuel breaks to provide anchor points for indirect attack. When existing fuel breaks are not present or available, they are developed during emergency suppression activities using bulldozers, hand crews, or aircraft (i.e., retardant). However, the fuel breaks described above often have limitations which severely constrain their utility and effectiveness. The most frequent limitation is firefighter safety, especially when fuel breaks are created during initial attack on a wildfire. Other limiting factors include location, fuel type, topography, weather, and lack of connectivity. These types of fuel breaks are being used or constructed under emergency situations and are not considered strategic.

Limitations can be eliminated or greatly reduced through proactive development of fuel breaks in preparation for future fires. A network of established strategically located fuel breaks would provide firefighters foreknowledge of where to safely begin suppression actions and how to best use available firefighting resources, as well as reduce on-scene planning time and allow firefighters to more quickly engage a fire.

Research and fire suppression activities indicate fuel breaks have either slowed fires enough for suppression crews to control the incident, or have altered fuel sufficiently to limit fire spread (Monsen and Memmott 1999). Boise District fire personnel have observed the effectiveness of established fuel breaks. Fires that have burned into established fuel breaks on the Boise District provided a greater margin of safety for firefighters, effectively reduced flame lengths, and slowed progression of wildfires (e.g., 2006 Ditto Rest, 2011 South Sim, and 2012 MM86 fires).

The BLM Idaho Falls District generated a report on the effectiveness of an established fuel break near Craters of the Moon National Monument and Preserve (CMNMP). In April 2012, the Idaho Falls District implemented the first phase of the Big Desert Fuel Breaks Project (BDFB). Fuel break construction consisted of roto-mowing existing vegetation to a height of roughly eight inches in 100- to 150-foot wide swaths from the centerline, creating fuel breaks 200 to 300 feet in width.

The Cox's Well fire ignited on July 10, 2012 within the National Park Service's portion of the CMNMP, which borders the Big Desert. Strong, gusty winds and hot, dry conditions caused the fire to spread quickly north, east, and south and into the Upper Snake Field Office area. Suppression operations of the wildfire began with initial attack crews attempting to anchor and contain the fire within BLM managed CMNMP lands. However, when direct attack efforts

failed, crews backed off to the Arco/Minidoka Road. As part of the BDFB project, fuel breaks had been established along portions of this road earlier in the year. The portions of the road with fuel breaks ultimately aided in suppression operations. Back burns conducted in the fuel breaks off the Arco/Minidoka Road, had average flame lengths of two feet. The BDFB mowed areas provided a safe area for suppression crews to implement effective back burn operations instrumental in controlling this wildfire (Dyer 2012).

1.2 Purpose and Need Statement

Since 1980, more than 170,000 acres have burned within the 293,891-acre Paradigm project area; roughly 80% of the fire starts were human caused, the majority occurring adjacent to the Interstate and State Highway 20. These roadside fires are dangerous for both firefighters and the public. Fires ignited along travel routes, as well as lightning caused fires within and adjacent to the project area, have contributed to conversion of the big sagebrush, perennial grasses, and forb community to invasive annual plant dominated communities. This plant community conversion has degraded slickspot peppergrass (proposed for federal protection under ESA) and greater sage-grouse (candidate for federal protection under ESA) habitat, and created an abundance of fine fuels leading to increased fires in the project area.

The BLM is proposing to develop a network of self-sustaining, low maintenance fuel breaks using existing roadways to the extent possible. The developed fuel breaks would accomplish the following objectives:

- Enhance firefighter and public safety by reducing the amount of fires that ignite and burn near roadways;
- Provide additional and improved points for fire suppression tactics;
- Reduce the size of fires that burn across the project area by compartmentalizing the project area into more defensible sections;
- Reduce the number of roadside fires that burn into the adjacent rangelands;
- Facilitate protection of remaining intact big sagebrush communities, including slickspot peppergrass and greater-sage grouse habitat; and
- Fuel breaks will protect future habitat rehabilitation and restoration treatments.

1.3 Conformance with Applicable Land Use Plans

The project area is under the jurisdiction of the 1983 Kuna Management Framework Plan (MFP), 1987 Jarbidge Resource Management Plan (RMP), and the 2008 Birds of Prey National Conservation Area (NCA) RMP. Objectives in the NCA RMP relative to the purpose and need include protection of existing stands of native shrub habitat, reducing the size and recurrence of wildfires in the NCA, and increasing shrub habitat through restoration. Management actions associated with these RMP objectives include the creation and maintenance of fuel breaks in areas where frequent fires threaten habitats. The Jarbidge RMP discusses the use of fuel breaks and while the Kuna MFP does not have objectives specific to fuel breaks, the project is in conformance with objectives for habitat protection and fire suppression outlined in these plans.

1.4 Relationship to Statutes, Regulations, and Other Requirements

- Conservation Plan for the Greater Sage-grouse in Idaho (2006) and the 2010 BLM National Strategy. In the Idaho plan, fuel breaks in the form of green strips was identified as infrastructure conservation measures on pages 4-43, item 3 and page 4-53, item 2.
- Instruction Memorandum (IM) 2013-128; Sage-Grouse Conservation in Fire Operations and Fuels Management.
- IM 2012-043; Greater Sage-Grouse Interim Management Policies and Procedures.
- 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 RAC symposium, Boise District BLM representatives met with the RAC sub-committee on several occasions to draft project alternatives and discuss issues. On November 17, 2011, the BLM formally initiated public scoping to identify additional issues.

Relevant issues identified during internal and external scoping include:

- How can the BLM increase the safety of firefighters and the public?

- How can the BLM more effectively reduce the size and 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

The proposed action was developed based on design features of effective fuel breaks as identified by firefighters and from input provided by concerned private citizens, state and federal agencies, and environmental organizations following the scoping process (Section 1.5). The action alternatives differ by routes used and acres treated.

2.2 Alternatives Considered But Not Analyzed in Detail

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

An alternative utilizing prostrate kochia along all proposed routes:

- Although prostrate kochia is the preferred species for fuel breaks, it establishes in slickspots, thereby competing with slickspot peppergrass, a plant species proposed for listing under the Endangered Species Act.
- Prostrate Kochia may not be appropriate in all areas as is described in Section 2.3.2.

An alternative utilizing only targeted grazing:

- Targeted grazing would require the construction and maintenance of up to two miles of temporary fence for each mile of fuel break. The amount of fencing required would have negative impacts to wildlife and add additional expenses.
- Grazing treatments need to occur while annual grasses are developing seeds but prior to seed dispersal, which requires a large number of livestock on the treatment area and removed as soon as biomass is consumed. The increased number of livestock would result in an increase of disturbance to the soil. In years with above average spring precipitation and optimal growing temperatures, or late spring precipitation, it may be necessary to repeat the grazing treatment to achieve effectiveness objectives. Targeted grazing at the project scale would be difficult to achieve based on the large number of animals needed for a short period of time, making it impractical and unfeasible.

An alternative utilizing only disking or blading:

- Creating just the minimal width (50 feet) of bare-soil fuel breaks across any of the alternative distances (87 miles up to 356 miles) would leave extensive amounts of bare soil exposed to wind and rain erosion and weed infestation.

- The use of soil sterilants would not be possible at this scale due to environmental and chemical label restrictions including potential for soil movement (drift) onto adjacent agricultural land and slickspot peppergrass habitat.
- Repeat application of disking would promote and encourage the spread of rush skeletonweed, Canada thistle, and other noxious and invasive weeds in the area. Treating weed infestations repeatedly overtime results in chemical resistant weed species.
- Disking once or twice annually, even if limited to the interstate fuel break miles proposed, is logistically infeasible, time prohibitive, and would not meet the purpose and need.

No Prostrate Kochia Alternative:
An alternative that would not utilize prostrate kochia in fuel breaks was considered but not analyzed because it did not meet the purpose and need of the project. Prostrate kochia is the plant species that best meets the criteria for fuel breaks in the project area. St John and Ogle (2009) listed the most effective characteristics for fuel break vegetation as:

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

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

2.3 Description of Proposed Action and Alternatives

Upon completion of the Draft EA and further analysis, the alternatives were consolidated from six to four. Two alternatives that were analyzed in the Draft EA, Alternatives 4 (Reduced Fuel Break Miles) and 5 (Reduced Miles and Exclusion of Mayfield Road) have been removed from further consideration. The analysis in the Draft EA showed there was very little difference between the two and they were essentially a subset of Alternatives 2 and 3, respectively. The EA now contains three action alternatives and a no-action alternative. Action alternatives were developed to meet the goals described in the Purpose and Need Statement. The same tools/methods for creating fuel breaks are analyzed for each alternative.

The 2014 version of the Conservation Agreement (CA) between the BLM and USFWS identified changes to fuel break development, specifically creating a one and one-half mile buffer zone

around slickspot peppergrass populations for the use of prostrate kochia. This new buffer zone limiting the use of prostrate kochia resulted in the following classification of proposed fuel breaks. The classifications are; Kochia fuel breaks – includes all areas beyond the one and one-half mile buffer around element occurrences of slickspot peppergrass, Non-kochia fuel breaks – includes areas within the one and one-half mile slickspot peppergrass buffer, and Kochia fuel breaks in slickspot peppergrass zones – includes areas of kochia within the one and one-half mile buffer but BLM has determined through analysis that the benefits of its use outweigh the associated risks.

Private landowners within the project area have the opportunity to work with the Idaho Natural Resources Conservation Service (NRCS) office for financial assistance to develop fuel break options where proposed fuel breaks cross private lands. A specific analysis of such is not available as listing where and when these fuel breaks would occur on private lands is speculative. However, the funding to complete this work on private land may be provided by NRCS and would meet the requirements of NEPA as described in Section 4.2.1.

2.3.1 Alternative 1 – No Action

A strategic network of fuel breaks would not be created and maintenance of existing seeded fuel breaks within the project area would not occur. Maintenance includes re-seeding herbaceous perennial species, herbicide application to reduce annual grass and forb densities, or other activities to enhance the effectiveness of existing fuel breaks in the project area.

2.3.2 Features Common to All Action Alternatives

Human caused fire starts are concentrated around major transportation corridors in the project area; therefore, the network of fuel breaks proposed would incorporate existing transportation corridors establishing buffers between rights-of-ways and wildlands. Most fuel breaks would be developed along existing roads, though others may be developed along the Union Pacific rail line or along fences where the community of Tipanuk abuts public lands. Regardless of which action alternative is selected, establishment of fuel breaks would be initiated along I-84 and Hwy 20 first since those areas have the highest number of ignitions. Where rights-of-ways exist within the project area, treatments would begin at the outer edge of the right-of-way.

Fuel break widths would vary to no more than 300 feet, depending on environmental constraints such as adjacent vegetation, geography, soil type, and/or to mitigate resource concerns identified during surveys. For example, a fuel break would be narrowed or shifted to avoid important resources or rocky areas.

Implementation would occur in the development of up to 100 miles of fuel break per year. Most fuel breaks would be 150 feet wide in the initial establishment. This initial development would provide a usable, but less than optimal, network of fuel breaks across the project area and would take three years to complete. Upon completion of the initial phase of development, it would take another three years to extend fuel breaks to the full 300 feet.

Resource surveys for cultural resources, and special status plants and wildlife were conducted for proposed fuel breaks on BLM, Bureau of Reclamation (BOR), and state lands. Survey boundaries spanned 400 feet from center line of routes to accommodate for possible shifts in the location of the 300-foot fuel break due to resource issues, geology, terrain, etc. Additional

cultural resource surveys would be required along the power line and additional fuel breaks added late in the planning process if Alternatives 2 or 3 are selected. For all action alternatives, additional cultural 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.

Surveys for nesting raptors would be completed each winter and early spring to identify active nests. Project implementation near active nests would be managed according to the BLM guidelines identified in Table 2.1. However, exceptions can be granted by the BLM Field Office Manager based on biological reasons such as nest failure, early fledging, topographic cover, or other factors that are biologically reasonable.

Table 2.1 - Buffer Stipulations to Protect Raptor Nest Sites between February 1 and July 31[1]

Species	Timing	Breeding Season Nest Site Buffer (miles)
Bald Eagle	Feb 1 – July 31	0.5 – 1.0
Ferruginous Hawk	Feb 1 – July 31	1.0
Golden Eagle	Feb 1 – July 31	0.5
Prairie Falcon	Feb 1 – July 31	0.5
Red-tailed Hawk	Feb 1 – July 31	0.33
Swainson's Hawk	Feb 1 – July 31	0.25
Burrowing Owl	Feb 1 – July 31	0.25

[1] timeframe for prohibiting activities around nest sites with active breeding attempts or until young disperse.

2.3.2.1 Methods

The methods analyzed in this EA include disking, mechanical thinning or mowing, herbicide treatments, targeted grazing, prescribed fire for seed bed preparation, and seeding of fire resilient vegetation. All methods would be implemented according to the design features and stipulations outlined in Section 2.3.2.2 below.

Disking

Disking would be accomplished using a rubber tired tractor or bulldozer or a series of disks to remove vegetation exposing bare mineral soil. 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 100 feet wide and would disturb soil approximately nine inches deep. Bare soil fuel breaks would require annual or bi-annual re-disking or herbicide application treatments to remove newly established vegetation. Disking for seedbed preparation would be followed by seed application (and possibly herbicide treatment, then seeding).

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. In general, thinning treatments would reduce shrub canopy to an average of 5 to 10 percent in the fuel break. Shrubs would be selectively thinned using

chainsaws and removed from the site, or pile burned when required conditions for burning are met (i.e., wet or frozen soils).

Mowing would be accomplished using a mower attached to a rubber tired tractor. Vegetation would be mowed to a height of 6 to12 inches. Areas treated by thinning and mowing would likely be followed by herbicide treatments to control invasive annual grasses and forbs or noxious weeds.

Herbicides

Only herbicides on the List of Approved Herbicide Formulations and Adjuvants (BLM 2014 IB 2014-69) are proposed for use. Analysis of proposed herbicide treatments to control targeted species is tiered to the *Vegetation Treatments Using Herbicides on BLM lands in the 17 Western States Programmatic Environmental Impact Statement* (PEIS) (USDI 2007a). The Record of Decision (ROD) for the Final PEIS identified herbicide active ingredients approved for use on BLM lands and Standard Operating Procedures for the application of herbicides (see Appendix 6.1).

Herbicide treatments would be used to prepare an area for seeding by eliminating competition and biomass, for fuel break maintenance to remove plants that do not meet the design criteria, or to control noxious weeds. Herbicides designed for uptake through root systems would be applied to the soil to reduce competition from other plants, prevent germination, and remove mature plants to maintain the effectiveness and integrity of established fuel breaks. Contact (foliar) herbicides applied to live plant tissue would be used to control established plants and reduce competition in preparation for seeding a fuel break. Ground based application methods would be employed rather than utilizing aircraft due to the spatial restrictions of the treatment areas. The herbicides proposed for use in the project area are presented in Table 2.2.

Table 2.2 - 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
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 PEIS (USDI BLM 2007a).

Targeted Livestock Grazing
Targeted grazing by cattle, sheep, and/or goats would be used to reduce the amount of plant biomass where other methods are not feasible, such as in steep or rocky areas. Launchbaugh and Walker (2006) define targeted grazing as "The application of livestock grazing at a specified season, duration, and intensity to accomplish specific vegetation management goals. The term 'targeted' refers to the specific plant or landscape that is the aim of controlled grazing practices". Using livestock in this manner would require fencing to confine the animals to the treatment area. This treatment must take place during the growing season of the target plant/area, which would vary depending on temperatures and precipitation. Targeted grazing could also be used for seeding/seedbed preparation in areas dominated by medusahead via consuming and breaking down the thick mats formed by this species.

Prescribed Fire
In areas dominated by annual grasses and forbs prescribed burning would be used to remove dense mats of accumulated biomass, especially associated with medusahead, to maximize herbicide exposure to soil or foliar contact. Prescribed fire would be restricted to the treatment area using existing roads, Class A foam[1], or disking a 25-foot wide fuel break around the edge of the proposed seeding area. Implementation of prescription burning would conform to a burn plan detailing the required conditions and expectations. Prescribed fire would typically be used in late fall, winter, or early spring when favorable conditions for containment and burning coincide.

Seeding
Plants utilized to create vegetated fuel breaks must meet the *Plant Species for Seeding* criteria outlined below. Establishment of fuel break specific vegetation would require reduction or elimination of existing vegetation to decrease competition. Methods that may be used for seedbed preparation include prescribed fire, disking, targeted grazing, and herbicide application. Equipment selection would be dependent on soil type and seed requirements to ensure seeds are deposited at the required soil depth. Implements are typically pulled behind a rubber tire tractor or track-driven bulldozer.

Minimal Soil Disturbance (0-1 inch)
Seeds requiring shallow or no soil cover would be deposited with equipment such as the Brillion grass seeder, a minimum till drill seeder, or hydro-mulching. Seeder implements typically have a press wheel, imprinter, or drag chains integral to the design. If these components are not part of the equipment, a separate pass with an imprinter, rubber tire culti-packer, or chain harrow would be made to increase seed to soil contact and germination success. Hydro-mulching combines seed and a mixture of moisture retention polymers, fertilizer, and tackifiers with water and organic material (mulch) creating a slurry that is sprayed from a nozzle under pressure onto the treatment site. Depending on the machinery, hydro-mulch can be sprayed a distance of up to 500 feet.

[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.

These types of seeding methods are preferred in, or in proximity to, areas of the Oregon Trail and slickspot peppergrass habitats (USFWS 2012, USFWS & BLM 2013).

Moderate Soil Disturbance (1-2 inches)
Seeds that require one to two inches of soil cover for germination and emergence would be deposited with equipment such as a standard rangeland drill with depth-bands. Rangeland drills employ a disk system to open the soil and deposit seed; if a press wheel, imprinter, or drag chains are not part of the equipment, a separate pass with an imprinter or rubber tire culti-packer would occur to improve seed to soil contact and germination success.

Substantial Soil Disturbance (2-6 inches)
Where existing plant species are to be plowed under, a standard rangeland drill would be used to open a furrow into the soil and deposit seed. If a press wheel, imprinter, or drag chains are not part of the equipment, a separate pass with an imprinter or rubber tire culti-packer would occur to improve seed to soil contact and germination success.

Plant Species for Seeding
To enhance establishment potential, cultivars specifically developed for use within the area would be selected. St John and Ogle (2009) listed the most effective characteristics for fuel break vegetation as:

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

Plant species proposed for this project include; Sandberg bluegrass (*Poa secunda*), bottlebrush squirreltail (*Elymus elymoides*), Russian wildrye (*Psathyrostachys junceus*), dryland alfalfa (*Medicago sativa*), dwarf green rabbitbrush (*Chrysothamnus viscidiflorus*), and prostrate kochia.

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

The growth form and phenological similarities enable Sandberg bluegrass to persist in areas dominated by cheatgrass. Sandberg bluegrass enters dormancy in May regardless of the amount of soil moisture (Laude 1953), resulting in dry above-ground biomass during the summer months when wildland fires typically occur, and resumes growth in late fall and into winter. It provides good, albeit diminutive, forage for grazing animals when it is actively growing; however, those periods are short-lived (Halvorson, 2011). Sandberg bluegrass is a common grass in the project area and across southern Idaho; several cultivars appropriate for the project area are available.

Seed placement should be in the top ¼ inch of firm soil and pressed in, it is not recommended to be a seeded in a pure stand, due to lack of longevity (Majerus et. al., 2009).

Bottlebrush squirreltail is a short-lived, mid-statured native perennial bunchgrass. Its persistence in a plant community is dependent on its ability to reseed itself. Bottlebrush squirreltail occurs naturally throughout the project area and cultivars are available that are adapted to the project area. This species germinates in fall or spring, initiates annual growth in early spring and does not enter complete dormancy in summer, remaining partially green throughout summer and into the fall. Seed should be placed ¼ to ½-inch deep into firm soil.

Russian wildrye is a non-native perennial bunchgrass originating from the Russian and Mongolian steppes of central Asia (Barkworth et al., 2007). It is adapted to the project area and has been used across southwest Idaho for many years. Russian wildrye remains green into the growing season and tends to exclude competition from other plants in established stands, developing wide spacing between the plants once established, making it a beneficial species in fuel breaks. It is palatable to all classes of livestock and wildlife, with higher protein content than most grasses (St John and Ogle 2009). Seed should be placed ¼ to ½-inch deep into firm soil. It is not considered weedy, and to date has not raised any environmental concerns (Ogle et. al., 2012).

Alfalfa is a long-lived perennial forb that is distributed throughout the entire United States. Alfalfa is a nitrogen-fixing legume with deep roots, allowing it to withstand long periods of hot, dry weather. New growth occurs from buds located in the plant crown. It is preferred forage for wildlife and livestock. The 'Ladak' cultivar is being proposed for the project area; it originated from northern India in 1910, and is very winter hardy. Seed should be placed ¼ to ½-inch deep into firm soil.

Dwarf green rabbitbrush is a native shrub that re-sprouts from the base (Wasser, 1982). It has been used successfully to revegetate depleted rangelands and other disturbed sites. It can be an important browse species for wildlife and livestock, but palatability varies significantly by subspecies. Seed can be deposited on the soil surface or drill seeded and seeding can occur in fall or spring on unprepared or prepared seed beds. Cultivars adapted to the project area are available.

Prostrate kochia is a semi-evergreen sub-shrub originating from central Eurasia. It is well adapted to arid regions and has been effectively used across southern Idaho for almost thirty years, including several fuel break projects around Boise and Mountain Home (Pellant 1992; Harrison et al. 2002). Prostrate kochia re-sprouts from the base following fire (McArthur et al. 1990, Harrison et al. 2002) and is competitive against invasive annual grasses and forbs (Tilley et al. 2012). Seeds would be broadcast applied to the soil surface and followed with a cultipacker to improve seed to soil contact for improved germination. Prostrate kochia seeds are very sensitive to environmental gradients and lose viability within a few months of collection, therefore local collections of seed would be emphasized and encouraged to ensure successful establishment.

Because it is competitive, established stands of prostrate kochia develop open spaces between plants, which Gray and Muir (2013) found "to be positively associated with biological crust cover and negatively associated with litter" and cheatgrass; these characteristics also improve fuel break effectiveness. Prostrate kochia retains foliar moisture late into summer reducing the rate of spread and intensity of wildfires (Harrison et al. 2002, Monsen and Memmott, 1999, Monsen 1994). Monsen and Memmott (1999) also documented fire burned two feet into prostrate kochia test strips and ran out of fuel even when exposed to wind speeds of 16.3 miles per hour (mph). With wind speeds in excess of 20-25 mph and residual plant litter in place, fire burned slowly and erratically through the prostrate kochia plots.

Prostrate kochia tolerates saline (sodic) soil conditions and has been used in mine reclamation projects because it can establish on harsh, depleted soils. Concerns have been raised of the potential for prostrate kochia to displace slickspot peppergrass resulting in limited use in areas known as being inhabited by slickspot peppergrass (BLM & FWS unpublished fuel break guidelines). Nature Serve reports that although prostrate kochia does possess the ability to persist in areas it does not appear to be spreading aggressively and ranked ecological impact as low/insignificant (NatureServe 2014).

Benefits of prostrate kochia in fuel breaks include:

- high protein forage utilized by wildlife and domestic animals
- minimal maintenance required once established to eliminate annual grasses and forbs
- controlled by standard herbicides

Potential disadvantages include:

- potential to spread from original planting
- can be a challenge to establish in high precipitation areas or if seeds are not fresh or properly cared for
- establishes in slickspots and playas within prostrate kochia seedings and may compete with slickspot peppergrass plants

2.3.2.2 Design Features

Design features were developed to minimize or eliminate adverse impacts of the proposed action to identified resources.

Soils

- Mowing, drill seeding, or targeted grazing would not occur when soils are saturated and easily rutted or compressed.
- A minimum till drill or rangeland drill with depth bands would be used to seed fuel breaks in soils with wind erodibility index values (WEI) of 134 or greater (i.e. sandy sites) to minimize soil disturbance.
- Herbicides to control annual grasses and forbs would not be used on soils with WEI values of 134 or greater unless adequate vegetative cover is present to reduce the potential of erosion (e.g., release of perennial plants).

Vegetation including Noxious and Invasive Weeds

- Disturbed areas would be monitored for noxious weeds, and appropriate treatments would be applied in conformance with the standard operating procedures identified in the Boise District Noxious Weed EA (EA#ID100-2005-EA-265) and the ROD for the Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States PEIS (USDI BLM 2007b).
- Herbicide application would utilize 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 would be treated prior to fuel break development or avoided to reduce the chance of spread.
- Mowing and seeding equipment, including vehicles and trailers, would be washed prior to use in the project area to reduce the potential for weed spread.
- Seeded fuel breaks would not be created in wetland or riparian zones (i.e. where riparian vegetation/hydric plants exist).
- Mowed fuel breaks would be maintained (re-mowed) when sagebrush has re-grown to an average height of 15 inches.
- Debris piles created during thinning operations would be limited to 15 feet in diameter and 10 feet in height, and would be ignited when prescription burn conditions are appropriate (i.e. soils are either wet or frozen).

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.

Slickspot peppergrass

- *Layout - for all Methods*
  - Within slickspot peppergrass Element Occurrences (EOs) and occupied habitat, including proposed critical habitat, fuel break design and layout would be coordinated with US Fish and Wildlife Service.
  - Within EOs and proposed critical habitat, slickspots would be flagged for avoidance by machinery and personnel.
  - Fuel break implementation within EOs or in occupied habitat would be overseen by a BLM botanist or qualified botany technician to ensure avoidance is maximized and impacts are minimized.
- *Surveys* - Upon completion of Stage 1 surveys in June of 2013 all potential habitat within the project treatment footprint was classified as slickspot peppergrass habitat on federal and state land. Additional Stage 1 surveys on 37 miles of new routes were completed in October of 2014; Stage 2 surveys of all previously recorded slickspots from Stage 1 surveys were completed in July of 2014. Two new EOs were documented within the treatment boundary; one was located during Stage 2 surveys and the other during other

field office monitoring; as a result the slickspot peppergrass habitat within a 0.5 mile buffer surrounding these new EOs was reclassified to occupied habitat.

- *Disking*
  - Would not occur within slickspot peppergrass EOs or proposed critical habitat.
  - Would only occur in occupied habitat (excluding proposed critical habitat) through annual site-specific coordination with FWS.
  - Would only occur in occupied habitat (excluding proposed critical habitat) in areas that are devoid of slickspots.
  - Would only occur in slickspot peppergrass habitat after three years of surveys confirm that the area in unoccupied slickspot peppergrass habitat.

- *Mechanical Thinning and Mowing*
  - Occupied habitat, including proposed critical habitat, would be thinned or mowed on a site-specific basis with direction from BLM and FWS botanists.
  - Mowing in slickspot peppergrass habitat would not occur when slickspot soils are saturated.

- *Herbicides*
  - Ground–based herbicide application within slickspot peppergrass management area boundaries, but outside of slickspots, 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 slickspots (USDI BLM 2006).
  - Within slickspot peppergrass EOs, herbicide would only be applied using hand sprayers. A 10-foot no-herbicide treatment buffer would be established around slickspots located in element occurrences. Within the buffer zone, weeds would be treated by hand (USDI BLM 2006).
  - Off-site movement of herbicides either through the air, soil, or over the soil surface would be avoided. Terrain, soil type, and vegetation would be taken into consideration when selecting herbicide type, application method, and application timing. Weed treatments using persistent herbicides would not occur within 150 feet of EOs (USDI BLM 2006).

- *Targeted Livestock Grazing*
  - Would not occur within slickspot peppergrass EOs or proposed critical habitat.
  - Within occupied habitat but outside of an EO, and within all slickspot peppergrass habitat, targeted grazing 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).
  - Livestock would not be allowed to gather, trail, or bed within slickspots of occupied habitat, including proposed critical habitat, or slickspot peppergrass habitat.

- *Prescribed Fire*
  - Would not take place within extant EOs.

- Would only occur in occupied habitat, inclusive of proposed critical habitat, through site-specific annual coordination with FWS.
- Slickspots in occupied habitat, including proposed critical habitat, but outside of a given EO would be flagged for avoidance by operational equipment, to protect against potential compaction and soil displacement.
- Would take place during periods when soils are frozen or wet to decrease potential damage to slickspot soils.

- *Seeding*
  - Native species would be a priority for use in seed mixes in occupied habitat, including proposed critical habitat (USDI FWS & BLM 2013).
  - Seeding in occupied habitat, including proposed critical habitat, and slickspot peppergrass habitat would occur via minimum or moderate soil disturbance seeding techniques as described in Methods (Tools), Section 2.3.2.1.
  - Prostrate kochia would not be utilized for seeded fuel break treatments within 1.5 mile of extant slickspot peppergrass EOs (USDI BLM 2012, USDI FWS 2012, USDI FWS & BLM 2014), except for the limited areas identified in Section 3.3.1 (Special Status Species, Affected Environment) .
  - Seedings would be monitored for establishment success; if areas are determined to be unnecessary or not capable of becoming successful seedings, those areas would be seeded with a mix of native grasses, forbs, and shrubs.

Cultural Resources

- No disking would occur in any archeological site.
- 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 would only be done when the soils are not wet or saturated.
- Seeding in National Register listed or eligible sites would be accomplished through hand seeders, or UTV/ATV mounted seeders. Seeding may be done within a site on a site by site basis with a minimum till drill or a standard rangeland drill, pulled by rubber-tired tractor, with depth bands when the soils are not wet or saturated. The use of a track-driven bulldozer to pull a rangeland drill will not be allowed in any archeological site. The use of a cultipacker or hydromulcher in any site would be determined in consultation with SHPO.
- 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 would be looked at individually.
- 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 would 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 would be pre-approved in consultation with the Idaho SHPO.
- *Standards Specific to the Oregon National Historic Trail*

- Drill seeding would not occur within 100 feet of trail remnants. The use of a culti-packer or hydro-mulching to place seed within the 100 feet would be determined on a segment by segment basis in consultation with SHPO.
- Disking would not be allowed within one-quarter mile of either side of the Oregon National Historic Trail.
- Trail remnants would not be disturbed during seeding or mowing. Mowing and or seeding would be parallel to trail ruts and would not occur within the trail corridor, which includes the swale or depression where the wagon wheels created ruts, and soil or rock berms on either side of the swale. An archaeologist would monitor all implementation activities along the trail.
- Thinning of vegetation along the trail corridor would 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 would 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 would 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 and treatment methods scheduled for implementation in proximity to the OR Trail would 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 3 miles of an occupied and active lek from March 1 through July 31 to reduce the likelihood of impacts to sage-grouse reproduction including lek attendance, nesting, and early brood rearing.
- Mow strips in PPH or within one mile of an active and occupied sage-grouse lek would not be wider than 50 feet. Beyond the 50 feet of mowing in PPH, sagebrush may be thinned by hand to approximately 5 - 10% canopy cover for up to 50 additional feet. Mow strips in PGH would not be wider than 100 feet and sagebrush may be thinned by hand beyond the 100 feet of mowing to approximately 5 - 10% canopy cover for another 100 feet.
- Permanent bare soil (disked) fuel breaks would not be established in PPH or PGH.
- Temporary fence would be constructed a minimum of 1.25 miles from occupied and active leks and marked in accordance with current marking specifications identified in IM No. ID-100-2011-001 and guidelines specified in BLM IM 2012-043 to reduce collisions by sage-grouse and impacts to other wildlife species.
- Disking would not occur from March 1st through July 31st to protect migratory birds and reduce the potential for impacts to Piute ground squirrel.

- NRCS-funded projects on lands within sage-grouse habitat would incorporate the Conservation Measures for the Firebreak Conservation Practice identified in the Conference Report for the Natural Resources Conservation Service Sage-grouse Initiative (SGI, Attachment 8.0).
- Mowing of sagebrush and disking 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. If occupied burrows are detected, mowing would not occur within 50 feet.
- No broadcast spraying of 2,4-D within 100 yards of active pygmy rabbit burrows. Only spot application would be used within 100 yards of active burrows.
- If pygmy rabbits are present, no application of herbicides within 100 yards of active burrows would occur from one hour before sunset to one hour after sunrise, to minimize the potential for direct contamination.
- Herbicides with the lowest likelihood of impacting wildlife would be used whenever possible. Herbicides that can cause harmful effects to wildlife would not be applied at the maximum rate.
- Surveys for raptor nesting activity would be completed two miles out from any site with proposed equipment operation (tractors, chainsaws) between January 1 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, unless the nest is abandoned, destroyed (wind, lightning, wildfire), or the young fledge before 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 (Map 15).

Visual Resource Management – Class I areas

- In proposed fuel breaks areas with intact sagebrush stands, 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 2to5 percent within 25 feet of a road edge. Beyond 25 feet, thinning would taper from 5 to 25 percent canopy at 100 feet from road edge.

2.3.2.3 Monitoring and Control

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

- Provide additional and improved anchor points for fire suppression tactics;
- Enhance firefighter and public safety by reducing the amount of fires that ignite near roadways and burn large acreages;
- Reduce the size of fires that burn across the project area by compartmentalizing the project area into more defensible sections;

- Facilitate protection of remaining intact big sagebrush communities, particularly those areas associated with greater sage-grouse habitat.
- Facilitate protection of remaining slickspot peppergrass EOs and intact habitats.
- Provide protection to future habitat rehabilitation and restoration treatments.

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

Effectiveness Monitoring
Treatment effectiveness monitoring includes the initial and subsequent collection of qualitative and quantitative information at randomly established monitoring sites (see Monitoring Plot Design in Monitoring Methodology Appendix 6.2). Effectiveness monitoring would be conducted at regularly scheduled intervals to inform whether treatments are becoming adequately established, whether re-treatments are necessary, and whether maintenance is required to ensure effectiveness. A minimum of one monitoring site would be established for every five miles of fuel break except as described below in Seedings Monitoring/Prostrate Kochia Fuel Breaks.

Effectiveness Monitoring consists of the following:
1. Pre-implementation inventory to establish a baseline of existing vegetation conditions in and adjacent to the proposed fuel break and would be used to inform which treatment method would be most appropriate for a given site; and
2. Post-implementation monitoring would inform management of resource conditions and would be used to spatially and temporally compare treatments, if subsequent treatments or maintenance is needed, and to determine progress towards meeting long-term goals.

Post-implementation effectiveness monitoring would be conducted annually for the first five years, then every three to five years thereafter to evaluate conditions of treatments and the need for additional or follow-up treatments (adaptive management). A minimum of one monitoring site would be established for every five miles of fuel break. Data would be collected prior to treatment implementation for baseline data and revisited at regularly scheduled intervals for data collection. Monitoring would be conducted utilizing a standard interagency monitoring tool called FEAT/FIREMON Integrated (FFI). The monitoring methods follow the established FFI guidelines and are described in detail in Appendix 6.2. Monitoring results would provide information on fuel break effectiveness in altering fire behavior to enhance fire control efforts and provide fire fighters a greater margin of safety and suppression options.

Vegetation characteristics to be measured include, but are not limited to:
- average shrub height and percent canopy cover
- height, density , and presence of all species, including cheatgrass and other non-native annual plant species of concern in the treatment area

- percent ground cover
- recruitment of introduced plant species from the treatment area into untreated periphery

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

Mowing/Thinning Shrub Cover Monitoring
Mowed or thinned fuel breaks would be monitored for regrowth (height of mowed species and density of thinned species).

- Where mowing is used to reduce shrub height to between 6 and 12 inches, retreatment would be scheduled when re-growth exceeds an average of 15 inches in height.
- Thinning treatments would reduce shrub canopy to an average of 5 to 10 percent and scheduled for maintenance when canopy cover exceeds 25 percent.

Seeded Fuel Break Monitoring
Seeded fuel breaks would be monitored for establishment of seeded species and presence of annual grasses and forbs.

- Reseeding would occur, when the average density of desired perennial plants is less than what is effective at controlling annual plant invasions.
- When the functionality of seeded fuel breaks is compromised by the presence of undesirable vegetation, one of the analyzed treatment methods would be used to restore fuel break effectiveness.

Prostrate Kochia Fuel Break Monitoring
All newly implemented and maintained prostrate kochia fuel breaks within the propose treatment footprint would be subject to the following additional Monitoring and Control protocols.

- At least one monitoring site would be established in each fuel break segment that intersects the one and one-half mile buffer zone for slickspot peppergrass. If monitoring data shows prostrate kochia moving from seeded fuel breaks, the number of monitoring sites would be doubled to improve detection and responsiveness.
- Monitoring sites would be established where prostrate kochia fuel breaks that were previously seeded occur in project treatment footprints within occupied habitat and the 1.5 mile buffer.
- Plants that have migrated outside of the treated areas would be physically removed, or spot treated with application of appropriate chemicals using Bureau-approved herbicides (see Appendix A).
- Monitoring results and subsequent control treatments would be reported annually to the FWS through the Level 1 team.

- Recognizing that prostrate kochia seedings exist across the project landscape that were implemented by private landowners, state agencies, and previously by the BLM, those areas seeded with prostrate kochia prior to implementation of this project are not subject to the same scrutiny or control methods, with the exception of maintenance within the proposed treatment footprints. Control of those populations outside of the treatment footprint is beyond the scope of the environmental analysis for the project and does not meet the purpose and need of the project.

Disking Monitoring
Disked fuels breaks would be inspected annually to evaluate condition. When biomass accumulates or plants persist in the disked treatment, herbicide, targeted grazing, or another analyzed treatment could be used to maintain fuel break effectiveness.

Noxious Weed Monitoring
Noxious weeds encountered within or adjacent to the project area would be photographed and a GPS position would be recorded in Universal Transverse Mercator coordinate system (UTMs). This information would be provided to the District Weeds Specialist for entry into the National Invasive Species Information Management System (NISIMS) per reporting requirements and to ensure an appropriate weed treatment occurs.

2.3.3 Alternative 2 – Proposed Action

In 2011, Boise District BLM Fire and Fuels staff evaluated proposed fuel breaks in the project area to determine suitability for use during fire suppression. A 356-mile network was identified for fuel break development on BLM, Bureau of Reclamation (BOR), and state managed lands from Blacks Creek to Glenns Ferry. This alternative would create fuel breaks to strategically compartmentalize the 293,891-acre proposed project area minimizing the risk of large scale wildland fires (Map 5). For analysis purposes, the maximum area of disturbance was used (356 miles at 300-feet wide on each treated route), which equates to approximately 12,878 acres total on Federal and State managed lands. The network of fuels breaks are divided into three types; Kochia Fuel Breaks, Non-kochia Fuel Breaks, and Kochia Fuel Breaks in Slickspot Peppergrass Zones.

The proposed action is to establish 274 miles of kochia fuel breaks covering approximately 9,854 acres, of which, 26 miles covering approximately 946 acres would be established within the 1.5 mile buffer around element occurrences of slickspot peppergrass. Other methods as previously described would be used to develop non-kochia fuel breaks (82 miles, 3,024 acres) within the buffer zones.

Prostrate kochia would be the primary plant species used to establish fuel breaks except in areas with resource concerns as described in Section 2.3.2. If prostrate kochia is not a suitable tool in a particular area, one or more of the following treatments may be employed to create fuel breaks:

- Disking/bare ground
- Mechanical thinning and mowing
- Targeted grazing (on a limited and site specific basis for development and maintenance of fuel breaks)
- Seeding short-statured perennial plants other than prostrate kochia.

2.3.4 Alternative 3 – North Boundary Adjustment

The northern boundary would be adjusted to the electric transmission line #906 that crosses east to west through the project area south of Mayfield road (Map 6). This alternative was developed to reduce potential impacts to the Oregon National Historic Trail. The Mayfield Road is designated by the State of Idaho as a backcountry byway and is recognized as the route of the Oregon Trail. The access road along the power line could be improved within the existing road prism to enhance firefighter access and fuel break establishment.

With this alternative, 305 miles of fuel breaks would be developed over a maximum of 11,030 acres. Approximately 223 miles of kochia fuel breaks would be developed (8,006 acres), of which, 20 miles (707 acres) would be established within the 1.5 mile buffer around element occurrences of slickspot peppergrass. Approximately 82 miles (3,024 acres) of non-kochia fuel breaks would be developed within slickspot peppergrass buffer zones.

2.3.5 Alternative 4 – High Human Ignition Areas Only

Approximately 92 miles of fuel breaks would be established along Interstate 84, Highway 20, and the Union Pacific rail line south of Mountain Home covering approximately 3,400 acres on Federal and State managed lands (Map 7). Eighty percent of the human caused fires start along these travel routes.

Implementation of this alternative would lead to the development of 71 miles (2,568 acres) of which, 6 miles (222 acres) would be established within the 1.5 mile buffer around element occurrences of slickspot peppergrass. Approximately 21 miles (832 acres) of non-kochia fuel breaks would be developed within the slickspot peppergrass buffer zones.

2.4 Comparison of Alternatives

Table 2.3 - Miles and roadside acres by action alternative

Alternative	Total Miles	Max Acres
2 – Proposed Action	356	12,878
3 – North Boundary Adjustment	305	11,030
4 - High Human Ignition Focus	92	3,400

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 be addressed further in this document:

- Wild and Scenic Rivers
- Wilderness
- Areas of Critical Environmental Concern
- Minority or economically depressed populations
- Water quality and fisheries
- Wetlands and riparian zones
- Paleontology

- Adverse energy impacts
- 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 effects expected from implementation 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).

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

1. Fuel Break Development – The NRCS would 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 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 (USDI BLM 2012).

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 (USDI BLM 2005), 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. Several routes for the transmission line have been proposed but a final decision on which routes would be used has not been made. Route number 8 passes through the project area and route number 9 is located south of the project area.

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, and upland birds

6. Wildfires – Wildfires have led to considerable negative impacts by consuming native vegetation and enhancing conditions for annual grasses and forbs to invade.
7. Residential Development – A planned community is proposed near the town site of Mayfield. However, there is uncertainty of what would 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 State Highway 21 Right of Way Fuel Breaks and Seeding – The Idaho Department of Transportation and the BLM have entered into a Memorandum of Understanding (MOU) to maintain the interstate right-of-way in a manner that would reduce fires from igniting and burning into adjacent rangelands. In 2014, a pilot project was initiated on 10 miles between Simco Rd exit and Ditto Creek Overpass to remove vegetation by disking and treating annual grasses and forbs with herbicides to maintain a clean strip. In other areas, treatments have included herbicide treatments and reseeding 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 Wildfire Management

3.1.1 Affected Environment – Wildfire Management

Wildland fire protection priorities are (1) human life, (2) property, and (3) natural/cultural resources. If it becomes necessary to prioritize between property and natural/cultural resources, this is done based on relative values to be protected, commensurate with fire management costs. Once people have been committed to an incident, these human resources become the highest value to be protected (Departmental Manual Part 620, DOI 1998).

The Boise District BLM has fire protection responsibility for approximately 4 million acres of public land in southwestern Idaho. Land status patterns vary across the District, with large contiguous blocks of BLM-administered land in the south, and smaller fragmented parcels in the north. The District also contains the densest population concentration in Idaho. Despite very sparsely populated areas, including wilderness, it has 42% of Idaho's population in 23% of its land area (USDC 2000). The Boise District often experiences fire ignitions that escalate to large fires in a short time, predominantly due to flashy fuel types combined with summer temperatures in the 90- to 105-degree range, and relative humidity in the 10- to 25-percent range. Historically, wildfires that "go big" and burn large acreages have often occurred following the passage of thunderstorms, when multiple ignitions occur across the District over a short period of time and firefighting resources are spread thin. During periods of high fire activity, multiple cooperators (city, rural, state, and other federal agencies) often provide additional suppression personnel until BLM can fully respond to wildfires.

The fire season typically starts in May and ends in mid-October although fires due occur as early as March and as late as December in dry years. Based on a 10-year average (2004-2013), the Boise District experiences 102 fire starts per year, and burns approximately 82,383 acres. Of these starts, 68% are human caused and 32% are naturally caused (lightning). During peak fire

activity, the District can staff up to 12 Type IV engines, 2 Type III engines, 2 water tenders, 3 dozers, and 1 Type III helicopter with crew.

The project area has an extensive fire history, influenced by I-84, Hwy 20, and the proximity of dense population centers and significant levels of annual grasses. Fires within the project area pose a substantial threat to public safety and fire suppression personnel. Often, firefighters have to suppress wildfires along the major travel routes where high speed traffic is a safety concern. Major travel corridors are sometimes closed until fire operations have successfully mitigated the threat to public safety and fire personnel. During the last three fire seasons (2011-2013) there have been 85 ignitions resulting in 59,615 acres burned within the proposed project boundary (Figure 1). Of these ignitions, 66 were human caused and 19 were naturally caused (lightning). In the summer of 2013, the Mudd Fire started from a lighting strike within the Paradigm project boundary and spread north across the Mayfield road, becoming part of the Pony Complex (comprised of 6 fires), and burning an additional 76,272 acres in the surrounding area. The total acres burned within or originating from within the project area is a combined total of 135,887 acres from 2011-2013.

The entire project area is classified as a high priority for the Boise District Fire Program primarily for the protection of life and property. The high fire load in the project area requires considerable investments of time and resources to protect life and property, often diverting resources that could be utilized elsewhere to protect natural resources such as wildlife habitat important for sensitive species including sage-grouse. State and federal agencies have readily acknowledged that the greatest threat to sage-grouse in southwestern Idaho and the Northern Great Basin is loss of habitat from fire (Idaho Sage-grouse Advisory Committee 2006; USFWS 2010a). According to IM-2013-128, *Sage-Grouse Conservation in Fire Operations and Fuels Management*:

> *"*…the BLM's goal is to limit the damage from unwanted wildfires in sagebrush habitat through comprehensive planning before a fire, prompt action during a fire, and effective rehabilitation following a fire. Consequently, offices would place a high priority and take appropriate action to minimize the size and adverse effects of unwanted wildfires in sage-grouse habitat. In addition, offices would place a high priority on planning and implementing fuels treatments that would reduce the start and spread of unwanted wildfires in sage-grouse habitat."

During periods of high fire activity, fire suppression resources are deployed based on the BLM's number one priority to protect human life. An example of this prioritization process is a multiple fire event (summarized below) which occurred July 6-14, 2012, and burned approximately 114,763 acres. Approximately 44% of acres burned during this event were within or adjacent to the proposed project area. Approximately 42% of the 114,763 acres consumed Preliminary Priority Habitat for sage-grouse during the Jacks Fire, located 30 miles south of the project area.

July 2012 Multiple Fire Event

Between July 6 and July 14, 2012, 22 fires were reported on the Boise District; 16 fires started as a result of lightning and 6 were human caused. Four of these ignitions occurred within and one immediately adjacent to the Paradigm project area, accounting for 50,161 acres of the

114,763 acres that burned during this period; 3 ignitions were human caused and 2 were caused by lightning. These fires received the highest priority because they were threatening life and property including houses, businesses (hotels, restaurants, and gas stations), energy infrastructure (gas lines, power lines, and wind turbines), main travel corridors (Interstate 84 and Highway 20), and range resources. All initial attack resources from the Boise District were committed, so additional resources from outside the area were ordered and assigned.

The Jacks Fire was one of several fires reported on July 9 as a result of lightning activity. The fire started in the Little Jacks Creek Wilderness Area approximately 30 miles south of Mountain home, and quickly grew in size due to the limited suppression resources available and its remote location. Efforts to obtain initial attack suppression resources for the Jacks fire were primarily affected by higher-priority fire starts within the Paradigm project area. It took approximately 3 days to adequately staff the Jacks Fire (the majority of suppression resources was ordered from outside the Boise District). Of the 48,894 acres that burned, 48,355 acres (99%) were sage-grouse priority habitat.

Below is a timeline that describes the fire activity for large fires (1000+ acres) that occurred between July 6 and July 14 in 2012. Four of these large fires occurred within or immediately adjacent to the Paradigm project area. If a fuel break system had been in place within the project area, Fire Managers could have potentially contained those fires faster and with fewer resources freeing fire suppression resources to respond to fires that threatened high priority natural resources such as priority sage-grouse habitat in the Jacks Fire.

- July 6, 2012 – Ditto Fire: 6,179 acres *within Paradigm* project area, controlled July 7.
- July 9, 2012 – South Indian Fire: 14,095 acres in Bruneau Field Office, controlled July 10.
- July 9, 2012 – Jacks Fire: 48,894 acres in Bruneau Field Office, controlled July 19.
- July 9, 2012 – Benwalk Fire: 29,100 acres *within Paradigm* project area, controlled July 11.
- July 10, 2012 – MM66 I84 Fire: 2,114 acres *within Paradigm* project area, controlled July 11.
- July 11, 2012 – Stout Fire: 12,768 acres *within and adjacent to Paradigm* project area, controlled July 15.

Paradigm Project - Fire History (02/01/2011 - 12/31/2013)

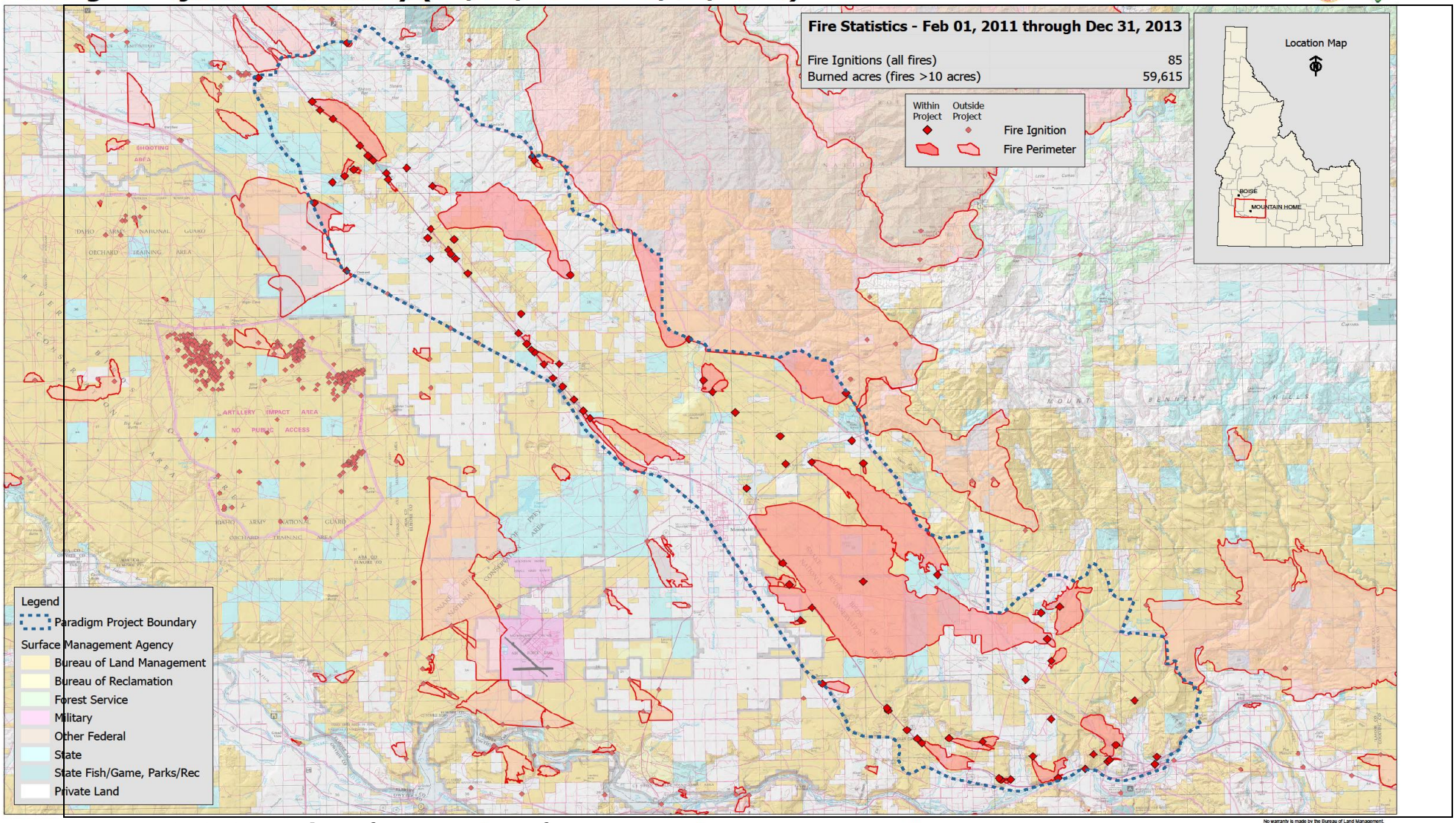

Figure 1: Fire ignition and area from 2011 to 2013 fire seasons.

3.1.2 Environmental Consequences – Wildfire Management

3.1.2.1 Alternative 1 – No Action

The No Action alternative would not have a network of pre-established fuel breaks across the project area. This area would continue to be a "resource sink" on firefighting resources due to the high fire load and high priority to protect life and property. Firefighter and public safety would not be enhanced and I-84 and Hwy 20 would continue to be extremely dangerous when fires are burning near these roadways. Without a network of fuel breaks, wildland firefighters would need to create their own fuel break during suppression actions, a process known as direct attack. This includes establishing safe anchor points where fire suppression personnel create fuel breaks to flank the fire perimeter until the head of the fire can be extinguished and the perimeter controlled. This flanking maneuver is accomplished by engine crews (i.e., wetline fuel break), heavy equipment (i.e. dozerline fuel break), handcrews (i.e. fireline fuel break), or aircraft (i.e., retardant fuel break) which effectively remove and douse fuels at the edge of the fire. There are often limitations of the fuel breaks identified above that can severely constrain their usefulness and effectiveness. The most frequent limitation impacting the use of these fuel breaks is firefighter safety, when fuel breaks are created during a wildfire event and fire personnel are exposed to hazardous conditions (e.g., smoke, heat, direct flame impingement). Additionally, these types of fuel breaks are not timely and are being used or constructed under emergency situations.

When direct attack is not safe or practical, back fires are often used to control rapidly moving fires by eliminating fuels along roadways in advance of the flaming front. In essence, this indirect approach substantially enhances the effectiveness of the road by eliminating the fuel that normally would feed an advancing fire. Roads used for this kind of tactic need to be readily accessible to emergency equipment and allow for the ignition of vegetation on one side of the road without accidental ignition on the opposite side. In addition, aircraft fire retardant drops can bolster and improve the effectiveness of existing roads during back fires. Often, the adjacent roadside vegetation is unsuitable to provide a safe and effective fuel break for back fire operations. When this is the case, heavy equipment is utilized to either widen the roadway or establish new fuel breaks across the landscape where firefighters can safely operate.

Firefighter and public safety would continue to be a major concern without a network of pre-established fuel breaks across the project area. The high fire load and high priority to protect life and property would not change and the trend of human caused fires along road corridors and large fire sizes would continue. This area would continue to be a "resource sink" on firefighting resources and would continue to divert resources that could be utilized elsewhere to protect natural resources and wildlife habitat important for sensitive species such as sage-grouse (refer to Section 3.1.1 Affected Environment – Multiple Fire Event Summary).

3.1.2.2 Alternatives 2-4 – All Action Alternatives

A network of effective fuel breaks along roadsides can mean the difference between containment and control of a wildfire at a few thousand acres as opposed to tens of thousands of acres, especially when only limited firefighting resources are available. Wildfire intensity and rate of spread would decrease as it entered these fuel breaks and in some cases, would extinguish before reaching the other side of the fuel break, thus reducing the chance of the fire burning over the

road. In addition, opportunities to safely engage wildfires using indirect tactics, such as back fires, would be increased and acres burned would likely be reduced over time.
The effectiveness of an established fuel break on the spread of wildfire can be demonstrated by first hand observations from firefighters in the field. Discussions and synopses of these fires are provided below. 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).

Cox's Well Fire

In the spring of 2012, the Idaho Falls District 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 Craters of the Moon National Monument and Preserve (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).

Southsim Fire

During the Southsim fire in 2011 the prostrate kochia fuel break along the east side of Simco Road gave firefighters a safe location from which to back burn due to decreased flame lengths and the lack of spotting within the fuel break (L. Neiwert, Fire Operations Specialist Battalion 10, Boise District BLM, personal communication, 2014; L. Okeson, Fuels Program Manager, personal communication, 2014). Additionally, the only location where the Southsim fire crossed control lines was along Highway 67 (Grandview Highway) in an area with heavy sagebrush immediately adjacent to the road (L. Neiwert, Fire Operations Specialist Battalion 10, Boise District BLM, personal communication, 2014). The weather hampered suppression efforts, but the prostrate kochia fuel breaks functioned well even as winds gusted to 28 mph.

MM86 I84 Fire

Similar fire behavior was observed during the MM86 I-84 fire of 2012. This was a human caused fire that started along I-84 near Lockman Butte, northwest of Mountain Home, ID. Following ignition, the fire meandered through the prostrate kochia fuel break adjacent to I-84 before eventually breaking through to the other side. Because this fire was started in October, response time was slower than during the active fire season. If the fire had been started during the regular fire season it is likely that fire crews could have controlled the fire before it broke through the prostrate kochia fuel break (L. Okeson, personal communication, 2014).

The installation of a network of pre-established fuel breaks in the project area would reduce the amount of human caused fires originating along transportation corridors that threaten adjacent wildlands, and provide fire personnel with a safe working environment to conduct fire suppression activities. Effective fuel breaks would compartmentalize the project area, helping to contain wildfires at a smaller size, thereby reducing the time and exposure of fire suppression resources and the public to the hazards of wildland fires. If implemented correctly, a network of pre-established fuel breaks have the potential to reduce the fire load and fire size within the project area, allowing fire suppression resources to respond to fires outside the project area that are threatening natural resources and wildlife habitat critical for sensitive species such as sage-grouse.

3.1.3 Cumulative Effects – Wildfire Management

3.1.3.1 Scope of the Analysis

The scope of analysis for cumulative impacts includes all land within the Paradigm project boundary and grazing allotments immediately adjacent to the project area. This scope is appropriate as fuel breaks would increase the likelihood of reducing wildland fire size in and immediately adjacent to the project area.

3.1.3.2 Current Condition and Past, Present, and Future Actions

Past actions have contributed to the current management of wildfires within and adjacent to the project area. The project area has an extensive fire history, influenced by I-84, Hwy 20, and the proximity of dense population centers and significant levels of annual grasses. As described in the Affected Environment (Section 3.1.1), many of these fires are human caused and pose a significant threat to public safety and fire suppression personnel. Actions impacting wildfire management that have occurred in the past and will likely continue into the foreseeable future include residential development, expansion of energy infrastructure (wind turbines and electrical transmission lines), motorized vehicle use, recreational use, livestock grazing, vegetative changes from wildfire and exotic species introductions, and fuel break development.

Residential Development

According to Departmental Manual Part 620 (DOI 1998), wildland fire protection priorities are (1) human life, (2) property, and (3) natural/cultural resources. If it becomes necessary to prioritize between property and natural/cultural resources, this is done based on relative values to be protected, commensurate with fire management costs. As residential development expands, fires occurring in a growing wildland-urban interface (WUI) will continue to require a high priority response from fire suppression resources.

Energy Infrastructure

The development of energy infrastructure would continue to place values (property) on the landscape that are at risk to wildfire. These values will remain a high priority for protection from the threat of wildfire and will continue to require a high level of response from fire suppression resources. More energy infrastructure would increase the likelihood of fires being ignited by the power lines and wind turbines.

Motorized Vehicle Use and Recreational Uses
The majority of fires that occur within and adjacent to the project area are human caused. Many of these fires originate along transportation corridors that burn into the adjacent rangelands. Motorized and recreational use within the project area will continue to add to the fire suppression workload from human activities.

Livestock Grazing
Livestock grazing (including trailing) occurs throughout the project area and in adjacent grazing allotments. Grazing at high intensity levels can affect wildfire spread by removing fine fuels (grasses). Grasses adjacent to water sources and along portions of fence line are often grazed to a level that would not support a flaming front. These heavily grazed areas could potentially increase the number of fire suppression opportunities available, above and beyond those provided by planted greenstrips along roads alone, although these grazed areas can change from year to year (e.g., removal of temporary fence, change in water source location) and might not be known to firefighting personnel in advance.

Wildfire and Exotic Species Introductions
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. Burning creates post-fire conditions favorable to annual grasses, like cheatgrass, and potential for an annual grass dominated community. Post-fire dominance by cheatgrass and other invasive annuals creates a plant community that burns more frequently than sagebrush dominated systems. In many areas, the fire-return intervals have been reduced to as few as 2 to 4 years because of cheatgrass dominance (Whisenant, 1990), particularly in former Wyoming big sagebrush communities. This increase in fire frequency within the project area would continue to place a high demand on fire suppression resources and require a high level of response.

Fuel Break Development
The Idaho Department of Transportation (IDT) and the BLM have entered into an Assistance Agreement to maintain the I-84 right-of-way in a manner that would reduce fire ignitions. In 2014, a pilot project was initiated on 10 miles between the Simco Road exit and Ditto Creek Overpass to remove vegetation by disking and treating annual grasses and forbs with herbicides to maintain a clean strip. In other areas, treatments have included herbicide treatments and reseeding 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.

3.1.3.3 Alternatives 2-4 – All Action Alternatives

Fuel breaks provide an opportunity to help mitigate actions that contribute to wildfire occurrence, reduce fire size, and can increase safety to firefighters and the public to the hazards of wildfire. Because the impacts of the proposed action alternatives improve and benefit how wildfire is managed, there would be no negative cumulative effects with implementation of any of the action alternatives from past, ongoing or reasonably foreseeable actions.

The proposed fuel breaks would reduce the risks associated with fires caused by energy infrastructure and aid in protecting energy development from wildfires. There would be no

additive impacts from the proposed fuel breaks and future energy infrastructure. Fuel breaks would help control wildfires resulting from motorized vehicles and recreation but there would be no cumulative effects from fuel breaks and this action. Grazing could enhance fire suppression and grazing in fuel breaks would make them more effective to some degree by further reducing fuel loading. The proposed fuel breaks would reduce the acres burned and the opportunity for the spread of invasive species that are prevalent across the project area. Existing and ongoing fuel break maintenance by IDT and BLM would enhance the effectiveness of fuel breaks developed from the proposed action.

3.2 General Vegetation and Noxious Weeds

3.2.1 Affected Environment – General Vegetation and Noxious Weeds

3.2.1.1 General Vegetation

Vegetation expected within the project area based on soils, climate, and natural disturbance regime would be classified as approximately 81% Loamy 8-12 inch precipitation zone characterized by Wyoming big sagebrush with a bluebunch wheatgrass (*Pseudoroegneria spicata)*/Thurber's needle grass (*Achnatherum thurberianum)* understory. Two other ecological sites of notable extent within the project area are; Sandy loam 8-12 inch precipitation zone and Shallow Loamy 8-12" (eight and two percent respectively). The Sandy loam ecological site is typically Wyoming big sagebrush with a bluebunch wheatgrass/Thurber's needle grass/needle and thread grass (*Hesperostipa comata* ssp. *comata*) understory. The Shallow Loamy 8-12 inch precipitation zone is characterized by Wyoming big sagebrush with a bluebunch wheatgrass understory. Twelve additional ecological sites describe the remaining nine percent of the public land within the project area.

In 2007, Tagestad and Downs updated a 2002 vegetation mapping effort utilizing Landsat satellite imagery, approximately 47% of the public land within the project area was classified 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 public 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 grasses and forbs. An additional 25% of the surveyed area either has cheatgrass as a major component of the understory or subdominant with Sandberg bluegrass, crested wheatgrass, or other annual grasses and forbs.

Prostrate kochia has been previously seeded on approximately 2,300 acres of BLM-managed lands and 180 acres of private land within the project area. A 600 foot wide, 5 mile long prostrate kochia fuel break was planted in the late 1980s and early 1990s on the north side of I-84 starting at Tipanuk and running southeast five miles towards Mountain Home. A 200-350 foot wide, 8.5 mile long prostrate kochia fuel break was planted in the late 1980s on the south side of I-84 from the Oregon Trail exit southeast of Mountain Home to the Chalk Flat/Dry Creek area. This prostrate kochia fuel break continued south of I-84 overland to the railroad tracks at Chalk Cut, and west and then northwest along the railroad tracks for approximately 3.5 miles.

Following the May fire in 2014 prostrate kochia was planted on private land within the project area (Mike Barnum, personal communication 2014).

Disturbance and Fire History

As described in Section 1.1 hundreds of wildfires have occurred 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 become invaded to varying degrees by annual grasses (cheatgrass and medusahead) and annual forbs (tumble mustard, tansy mustard, stork's bill, Russian thistle, and bur buttercup *(Ceratocephala testiculata)*. Many weedy 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 perennial species. Following disturbance, such as wildfire or heavy livestock grazing, plant communities experience an increase in invasive annual grasses and forbs. With repeated disturbance, invasive plants become the dominant species. In the project area where intact stands of shrubs still occur, theses invasive annual plants are a common component of, or dominate the understory, weakening the resilience of the plant communities in the event of disturbances such as fire.

Fire return intervals shorter than 10 to 15 years in a given area prevents the recovery of perennial species; thereby perpetuating the early seral plant community. Although the project area ecological site is identified as supporting Wyoming big sagebrush with perennial grasses and forbs, invasive annual grasses and forbs 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.

Approximately 44,100 acres in the project area that have burned in wildfires have been seeded post-wildfire, 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 1980s and 1990s, the Eurasian sub-shrub prostrate kochia was included in seed mixes for fuel breaks of varying widths (300-600 feet) along Interstate 84 (just outside the right-of-way) between the Simco and Hammett exits, as part of in the Inter-Agency Intermountain Greenstripping and Rehabilitation Project). This species was also included in several post-fire rehabilitation seed mixes during the same time period.

Livestock grazing has been a common land use 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. These past and current activities have contributed to the current conditions of the plant communities. Areas associated with the Oregon Trail were impacted by livestock and horses, both through soil compaction and foraging, occasionally permanently altering the plant community to varying degrees.

3.2.1.2 Noxious weeds

A noxious weed is defined as any plant designated by Federal, State, or county government as injurious to public health, agriculture, recreation, wildlife, or property (Sheley et al. 1999). A

noxious weed is also commonly defined as a plant that grows out of place and is competitive, persistent, and pernicious (James, et al, 1991).

Within or immediately adjacent to the project area, the following noxious weeds are known to occur; rush skeletonweed (*Chondrilla juncea*), whitetop (Lepidium *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 Cooperative Weed Management Area (CWMA). Plant species identified as "weedy" are uniquely adapted to increase in numbers and spread into previously uninfested areas following disturbances, and have the potential to alter soil stability and plant community diversity.

3.2.2 Environmental Consequences – General Vegetation and Noxious Weeds

3.2.2.1 Alternative 1 – No Action

Without a strategic network of fuel breaks to facilitate containment and reduce the amount of acres burned annually, large and/or frequent wildfires are expected to occur across the project area, based on wildfire trends over the last 30 years. In years such as 2012, when approximately 60,065 acres burned in and adjacent to the project area, extant stands of native plant communities would convert to invasive annual grasses and forbs. Loss of these remnant native stands reduces and eliminates important seed sources for natural recovery and limits the potential for habitat restoration.

Subsequent to wildfires, public lands are rested from livestock use, and may be closed to public access, to allow perennial plant recovery and/or residual biomass accumulation for soil protection; the length of time needed for adequate recovery would be expected to be extended in low resilient plant communities with low resistance to invasive plants. The period of closure and rest, provides perennial vegetation an opportunity to recover without additional disturbances and promotes vegetation and watershed recovery. Due to recent climatic trends, success of rangeland rehabilitation treatments is difficult to achieve and when successful, annual grasses often invade these seedings and forbs before seeded perennial species become established. Successful restoration treatments to re-establish a native perennial plant community would likely require several years and multiple attempts.

3.2.2.2 General Effects of Action Alternatives

Currently, nearly half of the Proposed Action footprint, and the entire project area, are mapped as exotic annual grasses and forbs with few or no shrubs (Map 8). The removal of established perennial plants from the treatment footprint and reciprocal replacement with seeded fuel break species would be a trade-off for the increased capability to reduce fire 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.

By design, existing vegetation within the footprint of the fuel breaks would be eliminated to develop the prescribed treatments by disking, targeted grazing, or seeding new species such as prostrate kochia. Seeded species would replace existing native species to ensure fuel breaks

consist of low statured, competitive, fire resilient species. Most existing bunchgrasses and forbs would not be expected to survive treatments involving high levels of soil disturbance or yearly maintenance (e.g., disking, targeted grazing, and herbicides). Herbicide treatments to control competition would target invasive annual grasses and forbs; however, perennial grasses and forbs may also become unintended targets. Repeated maintenance mowing over time may result in mortality of existing sagebrush plants within the footprint of the fuel break, requiring seeding of plants that fit the fuel break vegetation criteria. To achieve desired fuel break densities (i.e., 5-10%), thinning operations, could remove approximately 50-60% of the mature sagebrush or bitterbrush stands, depending on existing densities.

Disking

The direct effect of disking to create a fuel break would be the removal of existing vegetation from the 100-foot wide treatment footprint. Design features for fuel break maintenance in the action alternatives would reduce the potential for invasive annual grasses and forbs and noxious weeds to establish. Indirect effects of disking to create fuel breaks given appropriate levels of maintenance could include reduced potential for larger and/or more frequent wildland fire and increased capability to protect existing native plant communities and past and future wildland fire vegetation rehabilitation and restoration investments. Compensatory with the amount of area disked, repeated use of herbicides for maintenance treatments could result in "super" weeds, or species that develop resistance to herbicides.

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

Mechanical Thinning and Mowing

The direct effect of thinning using chainsaws or other mechanical tools to create fuel breaks would be 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, opening up the understory area.

Mowing would remove shrub branches and foliage higher than 6-12 inches within the treatment footprint. Removal of the shrub canopy often results in a short-term (one to three year) increase in young plants following treatment. Mowing would be repeated as shrub canopies regrow and exceed the 12 inch height. Repeat mowing of woody species can result in a decrease in vigor and increase in mortality.

Opening the shrub canopy through thinning or mowing can result in a release of herbaceous plants in the short-term (one to three-years), especially annual species (Davies et al 2011). Subsequent herbicide applications would likely be required to control noxious and invasive

weeds. An indirect effect of 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 current and future wildland fire vegetation rehabilitation and restoration investments.

Herbicides

This treatment could be used as 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 include invasive annual grasses and forbs, noxious weeds, and any native vegetation that doesn't meet fuel break criteria.

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

The risk of harming or killing off-site or non-target vegetation would be minimized through strict adherence to label direction and design features of the action alternatives. An indirect effect of herbicide treatment over time include reduced potential for larger and/or more frequent wildland fire and increased capability to protect existing native plant communities and past and future wildland fire vegetation rehabilitation and restoration investments.

Targeted Livestock Grazing

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

Utilizing annual spring grazing, prior to cheatgrass and medusahead seed dispersal could reduce the density and cover of these species over time (Finnerty and Klingman 1962). However, perennial grasses Sandberg bluegrass and bottlebrush squirreltail (with similar phenology to cheatgrass) would also be impacted (Murray 1971). Treatments that weaken or eliminate components of a plant community open niches that invasive plants exploit. Therefore, this tool would likely require increased maintenance using herbicides and eventually seeding of perennials to outcompete invasive plants. Targeted grazing could be used as a seed bed preparation tool, to remove the accumulation of annual biomass or to eliminate existing vegetation prior to seeding.

Indirect and long-term effects of properly managed targeted grazing and appropriate levels of fuel break maintenance 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). Medusahead and under certain climatic conditions; cheatgrass are known to be capable of producing an over-abundance of biomass in a calendar year. Due to the bulk of biomass generated in the arid environment, and the high silica content in medusahead decomposition is extremely slow, resulting in an accumulation over time. Therefore, fuel loading in these areas is predominantly composed of fine, flashy fuels and fire intensity would be low and of short duration. These fires rarely consume all seeds in the soil seed bank, and often only the seeds in the uppermost layer of the soil surface would be destroyed by prescribed fire (Diamond et al. 2012). As a follow-up treatment to prescribed burning, a pre-emergent herbicide treatment would be applied to inhibit residual invasive annual seed germination and emergence (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 be the reduced potential for larger and/or more frequent wildland fire, and increased capability to protect existing native plant communities and past and future vegetation rehabilitation and restoration investments.

In the event that a wildfire occurs in an area planned for fuel break development, the burned area would be considered for implementation using the wildfire in place of prescribed burning as a seedbed preparation method. Incorporating unplanned fires into the project implementation schedule would generate a cost savings and provide immediate protection for fire rehabilitation treatments.

Seeding/Prostrate Kochia

General

Depending on the type of equipment used to establish fuel break vegetation, soil disturbance would create conditions conducive to weed establishment and spread, particularly in the first two years or until seeded species become established. Design features of the proposed action such as equipment cleaning and pre- and post-implementation herbicide treatments of noxious weed infestations and invasive annual grass and forb control would reduce this potential.

Seeding perennial plant species for fuel breaks would change plant community composition and structure within the treatment footprint by replacing annual grasses and forbs, and/or native perennial grasses, forbs, and shrubs with perennial species that meet fuel break criteria. Species selected for this project have shown to be effective, or have potential to be effective at competing with invasive annual species. Design features to identify and treat introduced plants that spread beyond the treatment footprint are included in Section 2.3.

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

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

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

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

Although Gray and Muir (2013) documented prostrate kochia spread up to 2,328 feet (710m) from areas where it was drill seeded, six of the sites included in the study (including sites with spread distances of 2,328 feet (710m), 1,587 feet (484m), 1,578 feet (481m), and 1,548 feet (472 meters) had been aerially seeded with prostrate kochia prior to and/or subsequent to drill seeding. These aerial seedings were implemented in the 1980s and 1990s, and although seeding boundaries were delineated with flagging, boundary lines are often blurred when land adjacent to the seeding was BLM with no private or state land nearby. This, combined with the potential for seed drift, resulted in a high likelihood of seeds being introduced outside the identified seeding area. Harrison et al. (2000), described boundaries of aerial seedings as not well defined due to wind gusts and seed drift.

Prostrate kochia had also been drill seeded in a green strip 1,050 feet (320m) from the end of the transect where prostrate kochia was thought to have spread 2,328 feet (710m). This drill-seeded greenstrip had been reported in DeBolt (2002) and Tuason (2005). The 2,328 feet (710m) transect runs directly into a playa; additional data show that prostrate kochia had been aerially seeded on the west side of the playa, 590 feet (180m) from the end of the 2,328 feet (710m) transect. For five of the sites included in Gray and Muir (2013), the drill seeding boundaries were misidentified and the transects either started or ended inside a drill seeding. Prostrate kochia was drill seeded in 1986 within 1,312 feet (400m) of the site where Gray and Muir measured spread of 2,201 feet (671m). Based on these data summarized from BLM files, USGS Land Treatment Digital Library, Gray and Muir (2013), Gray (2011), and Erin Gray's site notes, Gray and Muir's findings do not accurately represent the distance that prostrate kochia can spread from seeded sites.

Several studies reported prostrate kochia spread into both intact and disturbed sites considerably less than Gray and Muir (2013) reported (McArthur et al. 1990, Clements et al. 1997, Harrison et al. 2000, Waldron et al. 2001, Monaco et al. 2003, Tilley et al. 2014). Waldron et al. (2001) collected spread data from 81 prostrate kochia seedings and found a maximum spread of 1,263 feet (385m) with a recruitment margin ranging from 0 to 98feet (0-30m) with an average recruitment margin of 20ft (6m). Across 28 sites, Gray and Muir (2013) reported a maximum spread of 2,328 feet (710m), a recruitment margin ranging from 0-646 (0-197m), with an average recruitment margin of 98ft (30m).

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

3.2.2.3 Alternative 2 – Proposed Action

This alternative prescribes a total of 12,878 acres to be converted into fuel breaks in the 300-foot wide treatment footprint. Based on the Tagestad and Downs interpretation of 2007 satellite imagery, of those 12,878 acres, approximately 4,000 acres (31%) would be in annual grasslands,

5,000 acres (39%) would be in big sage(brush) or big sage(brush) mix, and 1,000 acres (8%) would be in bunchgrass cover type. The remaining acres would occur in rabbitbrush, salt desert shrub, seedings, and other minor cover types.

3.2.2.4 Alternative 3 – North Boundary Adjustment

A total of 11,030 acres would be developed into fuel breaks, of which approximately 4,500 acres would occur in exotic annual grassland, 4,000 acres would occur in big sage and big sage mix, and 1,000 acres would occur in bunchgrass. The remaining 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 1,848 (8.6%) fewer acres. Fewer acres treated would result in less vegetation converted to fuel breaks and larger polygons defined by fuel breaks. These larger polygons would be at a greater risk for wildland fire than the polygons protected under Alternative 2.

3.2.2.5 Alternative 4 – High Human Ignition Areas Only

A total of 3,400 acres would be developed into fuel breaks, of which approximately 1,600 acres would occur in exotic annual grassland, 1,000 acres would occur in big sage and big sage mix, and 300 acres would occur in bunchgrass. The remaining 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 9,478 (74%) fewer acres. These larger polygons would be at a greater risk for wildland fire than the polygons protected under Alternative 2 and 3.

3.2.3 Cumulative Effects – General Vegetation and Noxious Weeds

3.2.3.1 Scope of Analysis

Between the various action alternatives, approximately 3,400 to 12,878 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.

3.2.3.2 Current Condition and Past, Present, and Future Actions

Current condition of vegetation in the 293,891-acre project area is as described in the Affected Environment section (3.2.1). The impacts discussed above by alternative, when considered with impacts of other actions (past, present and reasonably foreseeable) identified in Section 3.0 are described below.

3.2.3.3 Alternative 1 – No Action

Failure to take action would result in an increase in occurrence and fire size, thereby increasing acres converted from perennial plant communities to plant communities dominated by invasive annual grasses and forbs. Post-fire rehabilitation treatments would continue to be threatened, and impacted, by recurring wildfires. Increases in local human populations are likely to continue, resulting in more rural residential developments in the wildland urban interface and a commensurate conversion of native rangeland to residential landscaping and pavement. 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 or other remote, yet important habitats.

3.2.3.4 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.

3.2.3.5 Alternatives 3 &4 – 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. Focusing on areas with high incidence of human caused ignitions (Alternative 4) would provide a critical buffer in an important zone of ignitions; however the remaining portions of the project area at risk would not be compartmentalized and would be at risk of large wildfires that occur during storms with multiple lightning strikes.

3.3 Special Status Plants

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

Type 1 - Federally 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 (1 kilometer) apart are identified as a separate EO.

Proposed Critical Habitat (PCH) – Proposed critical habitat is defined in Section 3 of ESA as:

1. The specific areas within the geographical area occupied by the species, at the time it is listed in accordance with ESA, 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.

Areas within the Four Rivers Field Office proposed as critical habitat for slickspot peppergrass may or may not be currently occupied, were possibly occupied at the time of listing, though that

is also unknown, but are within the species' historical geographic range. Because EO rankings have not been updated for 9 to 16 years, some of the areas of proposed critical habitat do not support the Primary Constituent Elements (PCEs) identified by FWS as providing the necessary habitat conditions for the species to persist. For example, EO 112 was located in 2010 and was described as having two genets, poor vigor, in a single slickspot with moderate to high non-native plant cover and /or moderate to high anthropogenic disturbance. This EO was subsequently given a ranking of C which is not in line with the EO ranking specifications as described in Colket et al. 2006. It is likely that this EO will be ranked D once EO ranking updates become available and therefore will no longer be considered for proposed critical habitat.

Proposed critical habitat is a subset of occupied habitat and therefore will be analyzed as such in this EA.

Occupied Habitat – Refers to the location where slickspot peppergrass 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 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, and 1.4 inches of precipitation from March 1 through the end of May for the Glenns Ferry area.

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 October 2014 Stage 1 surveys were completed; all Potential Habitat was re-classified as Occupied or Slickspot Peppergrass Habitat due to survey findings within the project treatment footprint.

Fuel Break Classifications – The 2014 version of the Conservation Agreement (CA) between the BLM and the FWS identified changes to fuel break development, specifically creating a 1.5 mile buffer zone around slickspot peppergrass populations regarding the use of prostrate kochia. This new buffer zone, limiting the use of prostrate kochia, resulted in the following classification of proposed fuel breaks:

- Kochia Fuel Breaks – includes proposed routes outside the 1.5 mile buffer around element occurrences of slickspot peppergrass;
- Non-Kochia Fuel Breaks – includes proposed routes occurring within the 1.5 mile buffer around element occurrences of slickspot peppergrass, and
- Kochia Fuel Breaks in 1.5 Mile Buffer (Slickspot Peppergrass Zones) – includes proposed routes of prostrate kochia within the 1.5 mile buffer. These latter areas are explained in detail in this section below Table 3.2

3.3.1 Affected Environment – Special Status Plants

Within the proposed project area there are five BLM designated special status plant species; slickspot peppergrass, 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 extant 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	EO Rank[1] (year ranked)
Slickspot peppergrass (Type 1)	8	1,017	B (2005)
	10	3.9	D (2005)
	15	155	D (2005)
	20	3	C (2005)
	21	100	C (2004)
	26	683	B (2005)
	29	125	C (2005)
	30	675	B (2005)
	31	71	C (2005)
	51	4	BD (2010)
	54	0.3	F (2005)
	60	15	D (2005)
	61	14.7	C (2005)
	62	6	C (2010)
	63	8	D (2006)
	106	< 0.5	Not Ranked
	112	< 0.5	C (2010) [2]

Species (BLM Ranking)	EO#	Acres	EO Rank[1] (year ranked)
	113	< 0.5	CD (2010)
	115	< 0.75	C (2010)
	116	< 0.5	C (2012)
	117	< 0.5	CD (2012)
	New 4S7E11	0.75	Not Ranked
	New 4S8E15	23	Not Ranked
Wovenspore lichen (Type 2)	16	15	Not Ranked
	17	4	C (2000)
Packard's desert parsley (Type 2)	10	< 0.5	E (2005)
Mourning milkvetch (Type 4)	19	1.5	CD
	26	102	Not Ranked
	62	300	E
	64	28	Not Ranked
	65	8	Not Ranked
	66	8	Not Ranked
	69	24	Not Ranked
Snake River milkvetch (Type 4)	20	1 ,000	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]Element occurrence 112 was located in 2010 and was described as having 2 genets, poor vigor, in a single slickspot with moderate to high non-native plant cover and /or moderate to high anthropogenic disturbance. This EO was subsequently given a ranking of C which is not in line with the EO ranking specifications as described in Colket et al. 2006, though it is still included in the analyses.

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 typically 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 (Moseley 1994, Meyer et al. 2005). 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 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 BLM and USFWS consider 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 (USDI BLM & FWS 2014).

In 2006, BLM and the FWS entered into a conservation agreement that addressed ongoing activities affecting slickspot peppergrass (USDI BLM & FWS 2014). This CA provides 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 addresses survey protocol for potential and slickspot peppergrass habitat, and methods to conserve both slickspot peppergrass habitat and pollinator habitat.

As of June 2014, Idaho Fish and Game (IDFG) data indicated that there were 89 extant EOs that collectively comprise approximately 15,800 acres of total area broadly occupied by slickspot peppergrass; 24 located in the Inside Desert region south of Bruneau, ID, and 65 located within the northern range of the species, the Snake River Plain and Boise Foothills, which falls within the FRFO. Two new EOs were found southeast of Mountain Home during botany clearance surveys; one is 0.87 miles (1.4 kilometers) south of EO 62, the other is 5.05 miles (8.1 kilometers) east/southeast of EO 62. Rare plant reports of these new EOs were filed with the IDFG in September of 2014. Within the FRFO there are 107,416 acres of occupied habitat. This acreage includes the 0.5 mile buffer that surrounds each EO to protect pollinator habitat. As of June 2014, a total of 220,218 acres have been identified as slickspot peppergrass habitat within the FRFO.

Within or near the proposed project area there are 23 extant slickspot peppergrass element occurrences (EOs) as described in Table 3.1 (Map 9). Part or all of various EOs are located within the proposed fuel breaks (Table 3.2). Occupied habitat and/or the 1.5 mile buffer of six EOs (10, 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 3.2. Element Occurrences 10, 21, and 61 are located outside the project area but the 1.5 mile buffer of EO 10 and the occupied habitat of EOs 21 and 61 fall within the project area. There are 10,077 acres of proposed critical habitat, 29,088 acres of occupied habitat and 88,381 acres of slickspot peppergrass habitat that fall within the proposed project boundary (Map 10).

Table 3.2 - Distance from element occurrence to edge of 300 foot fuel break.

EO	Distance to edge of fuel break[1] / Type of fuel break					
	Alternative 2	Type	Alternative 3	Type	Alternative 4	Type
8	In fuel break	non-kochia	In fuel break	non-kochia	1.7 mi (9,158 ft)	non-kochia
10	1.1 mi (5,642 ft)	kochia	1.1 mi (5,642 ft)	kochia	1.1 mi (5,642 ft)	kochia
15	In fuel break	non-kochia	In fuel break	non-kochia	In fuel break	non-kochia
20	In fuel break	non-kochia	In fuel break	non-kochia	In fuel break	non-kochia
21	0.1 mi (744 ft)	non-kochia[2]	0.1 mi (744 ft)	non-kochia[2]	0.1 mi (744 ft)	non-kochia[2]
26	In fuel break	non-kochia	In fuel break	non-kochia	1.1 (5,792 ft)	non-kochia
29	In fuel break	non-kochia	In fuel break	non-kochia	In fuel break	non-kochia
30	In fuel break	non-kochia	In fuel break	non-kochia	In fuel break	non-kochia
31	1.33 mi (7,046 ft)	kochia	1.33 mi (7,046 ft)	kochia	1.9 mi (9,858 ft)	non-kochia
51	In fuel break	non-kochia	In fuel break	non-kochia	1.5 mi (8,000 ft)	non-kochia
54	0.3 mi (1,786 ft)	non-kochia	0.3 mi (1,786 ft)	non-kochia	0.3 mi (1,786 ft)	non-kochia
60	0.14 mi (769 ft)	kochia	0.1 mi (769 ft)	kochia	0.1 mi (769 ft)	kochia
61	0.3 (1,508 ft)	kochia	0.3 (1,508 ft)	kochia	0.3 (1,508 ft)	kochia
62	In fuel break	non-kochia[3]	In fuel break	non-kochia[3]	1.6 (8,188 ft)	non-kochia
63	2.0 (10,608 ft)	non-kochia	2.0 (10,608 ft)	non-kochia	2.7 (14,169 ft)	non-kochia
106	0.12 mi (633 ft)	kochia	In fuel break	kochia	5.8 mi (30,433 ft)	non-kochia
112	0.3 mi (1,745 ft)	non-kochia	0.3 mi (1,745 ft)	non-kochia	0.3 mi (1,745 ft)	non-kochia
113	0.03 mi (154 ft)	non-kochia	0.03 mi (154 ft)	non-kochia	1.2 mi (6,242 ft)	non-kochia
115	0.9 mi (4,582 ft)	non-kochia	0.9 mi (4,582 ft)	non-kochia	0.9 mi (4,582 ft)	non-kochia
116	In fuel break	non-kochia	In fuel break	non-kochia	In fuel break	non-kochia
117	In fuel break	non-kochia	In fuel break	non-kochia	In fuel break	non-kochia
New 4S7E011	0.6 mi (3,258 ft)	non-kochia	0.6 mi (3,258 ft)	non-kochia	1.5 mi (7,758 ft)	non-kochia
New 4S8E015	In fuel break	non-kochia[4]	In fuel break	non-kochia[5]	4.5 mi (24,003 ft)	non-kochia

[1]Distance to edge of proposed fuel breaks if fully implemented at 300 ft wide. [2]A prostrate kochia fuel break would be constructed 0.96 miles north of EO 21; the fuel break that runs 0.1 miles from the EO itself would be non-prostrate kochia. [3]A prostrate kochia fuel break would be constructed 1.36 miles east of EO 62; the fuel break that runs through the EO itself would be non-prostrate kochia. [4]A prostrate kochia fuel break would be constructed 1.14 miles north of the new EO in 4S8E15; the fuel break that runs through the EO itself would be non-prostrate kochia. [5]A prostrate kochia fuel break would be constructed 1.16 miles east of the new EO in 4S8E15; the fuel break that runs through the EO itself would be non-prostrate kochia.

Sixteen of the twenty three EOs listed in Table 3.2 have Habitat Integrity and Population (HIP) transects that are conducted yearly by the IDFG. Prior to HIP transects, slickspot peppergrass EOs were monitored using HII (Habitat Integrity Index) transects beginning in 1998.

As per the design features, prostrate kochia would not be utilized for seeded fuel break treatments within 1.5 mile of extant slickspot peppergrass EOs (US BLM 2012, US FWS 2012, US FWS & BLM 2014), except in the specific areas identified and described below.

EO 10 - In 1998 and again in 2005 this EO was given a ranking of D due to: small population size, very poor habitat condition, and a surrounding landscape of invasive annual weeds surrounded by agriculture land. No slickspot peppergrass plants have been observed in any of the HIP or HII transects since this monitoring began in 1998. Roughly 50 individuals were observed in 2005, possibly northwest of the HIP transect although the exact location was not recorded. During BLM surveys of slickspot peppergrass habitat types in the area surrounding EO 10 in 2008 no slickspot peppergrass plants were found. In 2012, EO 10 burned in the Rio fire. During a project clearance in October 2014 three first-year biennial plants were observed northeast of the HIP transect. These biennials were not found in a slickspot but were located on hummocky ground near what was historically a slickspot. The area to the northwest where 50 plants were observed was also surveyed but no slickspots or plants were found in this area. Element Occurrence 10 is not in a LEPA management area or in proposed critical habitat.

A 300-500 foot-wide prostrate kochia fuel break was developed in 1986, 1.28 miles (6,780 ft), at the closest point, north of EO 10. This existing fuel break would be maintained as described in the Methods section. If fuel breaks are fully implemented at 300 feet wide, the fuel break would be extended, to within 1.1 miles (5,642 feet), at the closest point, east of EO 10. If fuel breaks are fully implemented at 300 feet wide there would be 1.76 miles (62 acres) of new prostrate kochia planted within the 1.5 mile buffer and 1.65 miles (60 acres) of existing prostrate kochia fuel break that would be maintained within the 1.5 mile buffer of this EO on BLM-managed land. No prostrate kochia has been observed in any HIP transects, surveys, or clearances for this EO to date. Both the existing and the proposed fuel breaks are physically and geographically separated from this EO; Old Highway 30 and the railroad tracks separate the fuel breaks from the EO and the fuel breaks are approximately 2,000 feet lower in elevation than the EO. Due to these natural and manmade barriers, and the Monitoring and Control Design Features (Section 2.3.2.3) for prostrate kochia seedings, it is extremely unlikely that prostrate kochia could move from the fuel break treatment and negatively affect this already degraded EO and surrounding habitat.

Given the high number of past ignitions surrounding this EO a robust fuel break that has been proven to be effective is needed in this area; there have been 99 ignitions within a 3-mile radius, and 31 within a 1.5 mile radius of EO 10 since 1957, the majority of which were concentrated along Old Highway 30 and the railroad tracks.

EO 21 - In 2005 this EO was given a ranking of C. Yearly HIP transects since July of 2004 have failed to find any slickspot peppergrass plants in or near this EO, though no ranking update has been provided since 2005. Additionally no slickspot peppergrass plants were observed during BLM surveys of slickspot peppergrass habitat types in the area in 2012. A portion of EO 21 burned in 1957. This EO is in proposed critical habitat.

A 300-foot wide prostrate kochia fuel break was developed 0.96 miles (5,044 ft), at the closest point, north of EO 21 on the north side of I-84 in 1986; this fuel break was expanded in 1992 to

600 feet wide. This existing fuel break would be maintained as described in the Methods section. If fuel breaks are fully implemented at 300 feet wide there would be 0.68 miles (25 acres) of existing prostrate kochia fuel breaks that would be maintained within the 1.5 mile buffer of this EO on BLM-managed land. No prostrate kochia has been detected in this EO during 11 years of HIP transect surveys or during BLM surveys of slickspot peppergrass habitat types in 2012. The fuel break is located across I-84 from EO 21, providing an effective buffer, in addition to the approximately one mile physical separation, to deter prostrate kochia plants from establishing within EO 21. Due to these natural and manmade barriers, and the Monitoring and Control Design Features (Section 2.3.2.3) for prostrate kochia seedings, it is extremely unlikely that prostrate kochia could move from the fuel break treatment and negatively affect this EO and surrounding habitat.

Given the high number of past ignitions surrounding this EO a robust fuel break that has been proven to be effective is needed in this area; there have been 56 ignitions within a 3-mile radius, and 17 ignitions within a 1.5 mile radius of EO 21 since 1957, the majority of which were concentrated along Old Highway 30/Ditto Creek Road and I-84.

EO 31 - In 2005 this EO was given a rank of C due to poor to fair habitat quality, poor to fair landscape quality, and a relatively small number of plants. Population counts at the HIP transect for this EO has ranged from 0 to 458 plants. In 1998 wildfire was noted as a threat to the long-term viability of this EO. No slickspot peppergrass plants were found during BLM surveys of slickspot peppergrass habitat types in the area surrounding EO 31 in 2010. This EO has burned three times in the last 58 years; in 1957, 1982, and 2012. Following the May fire in early August of 2014 prostrate kochia was part of a seeding mix planted on private land approximately 1 mile southeast of EO 31. Roughly 40% of this EO is on private land. This EO is in proposed critical habitat.

If fuel breaks are fully implemented at 300 ft wide, a prostrate kochia fuel break segment would be located 1.33 miles, at the closest point, northwest of, and across Baseline Road from, EO 31; there would be 0.4 miles (19 acres) of new prostrate kochia planted within the 1.5 mile buffer of this EO on State-managed land. By employing all Monitoring and Control Design Features, and due to the physical separation of this EO, 1.33 miles from the proposed prostrate kochia fuel break, the implementation of a prostrate kochia fuel break 0.17 miles inside the buffer, would have no negative impact on EO 31 but could protect it from the negative effects of future wildfires. Baseline Road presents the best option in this area for fuel break development; there are no other suitable routes in the area. If Baseline Road were not used, a new route would have to be built to maneuver around the 1.5 mile buffer, adding additional habitat fragmentation in an already fragmented landscape.

EO 60 - In 1994 and again in 2005 this EO was given a rank of D with poor estimated viability and poor population vigor. When first observed in 1994 this EO contained 64 plants; since that time 1 slickspot peppergrass individual has been observed in the HIP transect in 2005 and 1 was observed in 2006; no plants have been observed since. No plants were observed during BLM surveys of slickspot peppergrass habitat types in the area in 2012. The site was heavily grazed and slickspots were trampled in 1998. In 2004 slickspots within the HIP transect sustained extremely severe penetrating livestock trampling. In the fall of 2009 the BLM portion of this EO

was fenced to exclude grazing. This EO is located in a high risk area for wildfires and has burned four times in the past 58 years; in 1957, 1982, 1984, and 2004. Half of this EO is located on BLM land, and half on private land, with private land surrounding the public land on three sides, in a patchwork of land ownership. The first two slickspots of the EO 60 HIP transect were destroyed in 2012 by agricultural plowing (Kinter et al. 2013). The entire eastern portion (50%) of this EO that is on private land was subjected to agricultural conversion as evidenced by aerial imagery.

If fuel breaks are fully implemented at 300ft wide, a prostrate kochia fuel break segment would be located 0.14 miles (769ft), at the closet point, southeast of EO 60 within occupied habitat. There would be 0.57 miles (21 acres) of new prostrate kochia planted within occupied habitat, and an additional 0.17 miles (14 acres) planted within the 1.5 mile buffer, of this EO on BLM-managed land. This EO is in poor condition, is possibly extirpated, is not in a LEPA management area, is not in proposed critical habitat and is surrounded by private land.

Given the high number of past ignitions surrounding this EO a robust fuel break that has been proven to be effective is needed in this area; there have been 91 ignitions within a 3-mile radius, and 25 ignitions within a 1.5 mile radius of EO 60 since 1957, the majority of which were concentrated along the railroad tracks and I-84.

EO 61 - In 2005 this EO was given a rank of C with population size ranging from 72 individuals in 2007 to 638 individuals in 2010. In 2005 one prostrate kochia plant was found near the HIP transect of this EO, no prostrate kochia was seen again until 2013 when one prostrate kochia plant was observed on Old Highway 30 to the southwest. In 2014 prostrate kochia plants were observed again near the HIP transect. There have been 13 fires since 1957 within the occupied habitat of EO 61 though the EO itself has only burned once; in 1957. A 30 foot-wide dozer line from the 1957 wildfire was built though this EO between HIP transect slickspots. This EO is immediately adjacent to private land, is not in a LEPA management area, and is in proposed critical habitat.

A 300 foot-wide prostrate kochia fuel break was developed 0.3 miles (1,508), at the closest point, northeast and across the railroad tracks from EO 61 in 1986. Maintenance would take place on this existing fuel break as described in the Methods section. If fuel breaks are fully implemented at 300 feet wide there would be 0.65 miles (22 acres) of an existing prostrate kochia fuel break that would be maintained within occupied habitat and an additional 1.27 miles (49 acres) maintained within the 1.5 mile buffer of this EO on BLM-managed land. By employing all Monitoring and Control measures, and due to the physical separation of this EO on the opposite side of the railroad tracks from the proposed prostrate kochia fuel break, it is unlikely that prostrate kochia would negatively impact EO 61.

Given the high number of past ignitions and fires surrounding this EO a robust fuel break that has been proven to be effective is needed in this area; there have been 97 ignitions within a 3-mile radius (70 of which were human-caused), 42 ignitions within a 1.5 mile radius, and 13 human-caused ignitions within a 0.5 mile radius of EO 61 since 1957, the majority of which were concentrated along the railroad tracks and I-84.

EO 62 - In 2000, 2005 and 2010 this EO was given a rank of C. Between 2005 and 2012 the HIP transect population of this EO ranged from 3 to 297. When combined with various BLM survey and clearance data since 2008 the population of this EO could range up to 500 individuals. Portions of EO 62 burned in 1957 and 1981; the entire EO burned in the 2012 Benwalk fire.

If fuel breaks are fully implemented at 300 feet wide, a prostrate kochia fuel break segment would be located 1.36 miles (8,612 ft), at the closest point, east of EO 62; there would be 1.22 miles (70 acres) of new prostrate kochia planted within the 1.5 mile buffer of this EO on BLM-managed land. The majority of this EO is greater than 1.5 miles from the proposed kochia fuel break; one slickspot with 57 individual slickspot peppergrass plants was observed in 2009, 1.36 miles from the edge of the proposed fuel break. By employing all Monitoring and Control Design Features, and due to the physical separation of this EO, 1.36 miles from the proposed prostrate kochia fuel break, the implementation of a prostrate kochia fuel break 0.14 miles inside the 1.5 mile buffer, would have no negative impact on EO 62 but could protect it from the negative effects of future wildfires. The network of fuel breaks in the immediate area near EO 62 will be implemented without the use of prostrate kochia which would not be as effective as the prostrate kochia fuel break in protecting the area from wildfire.

Given the high number of fires within occupied habitat and in the broader surrounding area, a robust fuel break that has been proven to be effective is needed in this area; there have been five fires within the occupied habitat surrounding this EO since 1957 and thirty four fires within three miles of this EO.

EO 106 - This EO is currently unranked. An unknown number of plants were found in 2001 in this EO. No plants have been observed in yearly visits to this EO that began in 2008. This EO burned in the 1984 Rye Grass fire. This EO is not in a LEPA management area or in proposed critical habitat and was not listed as an EO by the FWS in the Draft Best Available Biological Information for Slickspot Peppergrass (2006, pp 25-27).

If fuel breaks are fully implemented at 300 feet wide, a prostrate kochia fuel break segment would be located 0.12 miles (633ft) east of EO 106 along Bennett Mountain Road in occupied habitat; there would be 1 mile (72 acres) of new prostrate kochia planted within occupied habitat and an additional 5.1 miles (369 acres) planted within the 1.5 mile buffer of this EO on BLM-managed land. Because this EO is likely extirpated, prostrate kochia fuel breaks in the area surrounding this EO would serve to protect B-ranked LEPA EO 26 to the south from future wildfire and would protect the sagebrush habitat in the greater area from future wildfires.

Given the high number of fires in the area surrounding this EO, the past and present conditions of the EO and surrounding areas, and the close proximity to Bennett Mountain Road and several high-voltage power lines, potential ignition sources for wildfire, a robust fuel break that has been proven to be effective is needed in this area; there have been 16 fires within 3 miles of this EO since 1973.

Unassigned EO in T4S, R8E, Section 15 - This EO was discovered in 2014 during surveys for special status plants within the Paradigm project treatment footprint and is therefore currently

unranked. A total of 126 individuals were found in 6 slickspots during a subsequent thorough survey of the BLM and state land in the area surrounding the occupied slickspots. This EO burned in 1974 and again in 2012 in the Benwalk fire.

If fuel breaks were implemented at 300 feet wide, a prostrate kochia fuel break segment would be located 1.14 miles, at the closest point, north of this EO; there would be 2.7 miles (194 acres) of new prostrate kochia planted within the 1.5 mile buffer of is EO on State-managed land. A Non-Kochia fuel break is proposed for development through the EO but is unlikely to be fully effective since the EO itself is found within 300 feet of the route centerline, thus limiting fuel break implementation options. Implementing a prostrate kochia fuel break to the north along an existing power line road would provide the best viable alternative for fuel break development in this area.

Given the high number of fires in the area surrounding this EO, the close proximity to Bennett Road and several high-voltage power lines, potential ignition sources for wildfire, a robust fuel break that has been proven to be effective is needed in this area; three fires have burned within the occupied habitat of this EO since 1974 and twenty one fires have burned within three miles of this EO since 1957.

The average population size from the 16 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 FRFO is presented in Table 3.3 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 3.3 by alternative; e.g. 12% of FRFO slickspot peppergrass population falls within proposed fuel breaks under Alternative 2.

Table 3.3 - 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
EO	Population size	12%	12%	4%
	# of EOs within fuel breaks	19%	19%	8%
Acres	Occupied	1.6%	1.6%	0.6%
	Slickspot peppergrass	3.1%	2.9%	1.5%
	Proposed critical	2.8%	2.8%	0.5%

Approximately 18-25 percent of known slickspot peppergrass habitat in the project area is dominated by invasive annual grasses and forbs as determined through HIP transects and BLM surveys of slickspot peppergrass habitat types. Much of the native plant communities that historically inhabited the project area have been altered by the recurrence of wildfires and historic livestock grazing.

Historically, slickspot soils had lower organic matter than surrounding soils (Fisher et al. 1996). Kinter et al. (2012) noted that organic matter within slickspots is increasing as a result of increased litter from invasive annual plants 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 (by cheatgrass) 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 and native perennial grasses. In the past many slickspots were drill seeded without depth bands resulting in damage to the slickspot soil layers thus allowing both seeded and unseeded species to become established within drilled slickspots. Many past rangeland seedings in the project area have not been successful, which has resulted in large areas dominated by invasive annual grasses and forbs such as cheatgrass and tumblemustard.

Prostrate kochia has been previously seeded on 62 acres of occupied habitat and 1,001 acres of slickspot peppergrass habitat within the project area on BLM-managed lands. A 600 ft wide, 5 mile long prostrate kochia fuel break was planted in the late 1980s and early 1990s on the north side of I-84 starting at Tipanuk and running southeast five miles towards Mountain Home. A 200-350 ft wide, 8.5 mile long prostrate kochia fuel break was planted in the late 1980s on the south side of I-84 from the Oregon Trail exit southeast of Mountain Home to the Chalk Flat/Dry Creek area. This prostrate kochia fuel break continued south of I-84 overland to the railroad tracks at Chalkflat, and west and then northwest along the railroad tracks for approximately 3.5 miles. Following the May fire in 2014 prostrate kochia was planted on private land within the project area approximately one mile southeast of slickspot peppergrass EO 31 (Mike Barnum, personal communication 2014).

Prostrate kochia has been reported to establish well in slickspots within areas that were drill and/or aerially seeded with prostrate kochia (DeBolt 2002, Gray 2011, Kinter et al. 2012), 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 both 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 an annual plant community, but essentially disappeared from a shrub community 6-7 years after being seeded with prostrate kochia and subjected to various disturbances. Lack of persistence of prostrate kochia in some slickspots could be related to its inability to tolerate flooding or soil with a water table (USU 2014).

Table 3.4 - Presence of prostrate kochia in and near slickspots within HIP transects

HIP	Meters to prostrate 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	2,400	0.3			0.05											
018b	1,670				0.30		0.40	0.03								
019a	660		3.65	3.23	0.20		0.10									
019b	0	0.3	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	4,600				0.05											
32	13,800									0.03						
42	4,200												0.10	1-10	0.10	
52	38,000					0.03										
61	635			0.03												
62	3,400			0.03												
63	5,700				0.05											
68	150											<1		<1		10-25

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

Other Special Status Plants

Three EOs 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 non-kochia fuel break, however this EO was determined to be extirpated in 1998 (per Idaho Fish and Game Element Occurrence Record). Element occurrence 16 is 2,692ft from a proposed non-kochia fuel break and would not be impacted by the proposed action. Element Occurrence 17 is 2,864ft from a proposed non-kochia fuel break and would not be impacted by the proposed action; therefore this species will not be discussed further.

There is one Element Occurrence of Packard's desert parsley, a Type 2 BLM sensitive species, within the project boundary 3,057 feet from a proposed kochia fuel break (Table 3.1). There are 17 element occurrences of Packard's desert parsley in Idaho. No Packard's desert parsley was found during special status plant surveys along proposed fuel breaks. Additionally no plants of this species were discovered during BLM surveys of slickspot peppergrass habitat types in the area in the area surrounding the known EO. Therefore, this species will not be discussed further.

Mourning milkvetch is a BLM Type 4 sensitive plant species (Table 3.1); portions of six EOs are located within proposed kochia and non-kochia fuel breaks of Alternative 2, and 3. There are 65 extant mourning milkvetch EOs within the state of Idaho. Surveys of special status plants in recent years within the Boise District have revealed this species to be much more prevalent than previously reported (personal communication, Mark Steiger, 2014). Implementing fuel breaks in these few EOs is unlikely to negatively impact the species within the Boise District or within the state of Idaho. 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 BLM

surveys of slickspot peppergrass habitat types in 2011 in the general area. No Snake River milkvetch was found during the special status plant surveys along proposed fuel breaks. Therefore, this species will not be discussed further.

3.3.2 Environmental Consequences – Special Status Plants

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 Geographic Information System (GIS) data. Surveys of all potential, slickspot peppergrass and occupied habitat within proposed fuel breaks were completed in 2014. While several new occupied slickspot peppergrass locations were identified during the surveys, most of the new locations were within one kilometer of known EOs and would therefore be incorporated into those existing EOs. Two new EOs were found southeast of Mountain Home during botany clearance surveys, as described above.

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 3.5 - Estimated extent of affected habitat within proposed fuel breaks on federal and state land.

Habitat Type	Alternative 2		Alternative 3		Alternative 4	
	Miles	Acres	Miles	Acres	Miles	Acres
Occupied	50	1,808	51	1,838	16	596
Slickspot Peppergrass	189	6,885	165	6,004	44	1,598
Proposed Critical	25	920	25	920	6	228
Total*	239	8,693	216	7,842	60	2,194
EO	5	176	5	176	2	63
EOs Within Fuel Breaks	8, 15, 20, 26, 29, 30, 51, 62, 116, 117, T4SR8E Sec. 15		8, 15, 20, 26, 29, 30, 51, 62, 106, 116, 117, T4SR8E Sec. 15		15, 20, 29, 116, 117	

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

3.3.2.1 Alternative 1 – No Action

If no action is taken, slickspot peppergrass and its habitat would not be directly impacted by the establishment of fuel breaks and the associated effects as discussed above and 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 habitats and other special status plant habitat. Existing fuel breaks would not be maintained, would continue to degrade, and would provide little deterrent to wildfire spread. Occupied and co-occurring critical habitat would have no protection from future rapid-spreading, uncharacteristically large, hot wildfires.

In 2006, wildfire and invasion of annual plants and noxious weeds were identified as the two primary reasons for slickspot peppergrass decline and loss of habitat (USDI FWS 2006). 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 EO 51 (~200 acres), EO 62 (~ 278 acres), and EO 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 every slickspot peppergrass EO in the project area except EO 115 has burned in a wildfire. Fire perimeters within the project area total 8,560 miles since 1959. The majority of these fire perimeters likely became dozer lines in an attempt to control a given fire. Currently all attempts are made to avoid slickspot peppergrass EOs and occupied habitat when fighting fires but EOs and occupied habitat may be sacrificed when life and property are threatened.

If no action is taken 29,088 acres of occupied slickspot peppergrass habitat, 2,880 acres of which are in extant slickspot peppergrass EOs and 10,077 acres of which are proposed critical habitat, would not be protected from future wildfires or the potential effects of firefighting activity. If no action is taken 88,380 acres of slickspot peppergrass habitat within the proposed project boundary would have no protection from future wildfires or the potential effects of firefighting activity.

As wildfires continue to burn through slickspot peppergrass EOs and habitats, invasion of annual grasses and forbs 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 invasive annual plants.

3.3.2.2 General Effects of Action Alternatives

The FWS identified the primary factors threatening slickspot peppergrass, which include changes in wildfire regime (i.e., increased wildfire frequency and size) and invasive annual 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).

<u>Disking</u>

Slickspots that are disked could be permanently lost or changed to the point where they are no longer hospitable habitat for slickspot peppergrass. Soil deposition within slickspots from nearby disking 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 invasive annual grasses and forbs to establish within 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 disking of fuel breaks continues. A benefit of disked fuel breaks would less area impacted as they would only be a maximum of 100 feet wide.

Mechanical Thinning and Mowing

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 sites. 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.

Herbicides

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 invasive annual plant biomass and seed sources, and improving pollinator habitat with the removal of invasive annual grasses and forbs. Risks include a decrease in native forbs which may provide forage for potential pollinators.

Targeted Livestock Grazing

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.
Targeted grazing would not be authorized in EOs; therefore, damage to individual plants and/or slickspots would not result. Targeted grazing within occupied habitat, but outside of EOs, could result in the permanent loss of seeds within the seed bank if 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 retain seeds. Targeted grazing would likely occur in the early growing season which coincides with the time when soils are often saturated. In general it is unlikely that it would be authorized in occupied habitat, slickspot peppergrass habitat, or slickspot peppergrass EOs due to design features. During drought years, these conditions may not preclude targeted grazing during this time period, and therefore the described impacts could occur.

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. Invasive annual grasses and forbs may more easily establish in 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 no grazing would be allowed within EOs. Targeted grazing could lead to the spread and continued persistence of invasive annual grasses and forbs, and noxious weeds through both physical transport and continuous soil disturbance.

Prescribed Fire

Prescribed burning could result in loss of native forbs and could increase habitat fragmentation thus interrupting pollinator flight patterns and movement between EOs, and decrease available pollinator nesting and egg-laying sites. Because slickspots are becoming increasingly colonized by invasive annual plants (Kinter et al. 2012), heat from prescribed burning through slickspots containing invasive annual grasses and forbs, 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 the 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/Prostrate Kochia

General

Slickspots are not likely to be lost from seeding operations 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.

Broadcast seeding and subsequent imprinting of shallow seeded species would have minimal effect on slickspots in slickspot peppergrass habitat.

Seeding species that require less than an inch of soil cover in occupied habitat using minimum till drills or standard rangeland drills with depth-bands would limit slickspots from damage to 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 to the restrictive clay layer during post-fire seeding using depth bands or minimum-till drills following the 2012 Benwalk Fire (Amy Stillman, personal observation).

Seeding that require 1-2 inches of soil cover in slickspot peppergrass habitat using standard rangeland drills could lead to seeds being buried to a depth at which they are unable to emerge following germination, could damage the restrictive layer and change the way water infiltrates a given slickspot thus changing the functionality of the slickspot.

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 (Tuason 2005, DeBolt 2002) which occurs outside of the project area but in the cumulative impacts analysis area. 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 could likely also render it competitive to native grasses and forbs.

Because of its ability to establish within slickspots, prostrate kochia would most likely compete with slickspot peppergrass plants and seeds for water and nutrients within slickspots if planted directly in slickspot peppergrass EOs. Prostrate kochia would not be seeded within 1.5 miles of slickspot peppergrass EOs with the following exceptions; 1.1 miles east of EO 10, 0.96 miles north of EO 21, 1.33 miles north of EO 31, 0.14 miles southeast from EO 60, 0.3 miles northeast and across the railroad tracks from EO 61, 1.36 miles east of EO 62, 0.12 miles east of EO 106, and 1.14 miles northeast of the new EO in T4S, R8E, Section 15 (See Section 3.3.1 for discussion of the past and current condition of each of these EOs). Prostrate kochia is the preferred species for seeding in slickspot peppergrass habitat. The Monitoring and Control Plan outlined in Appendix 5.3 would be implemented following prostrate kochia seeding fuel breaks.

If prostrate kochia is planted within slickspot peppergrass habitat then slickspots within this habitat type could be lost for future reintroduction of slickspot peppergrass. It is unknown at this time if slickspots can be planted or seeded with slickspot peppergrass to allow re-introduction of this plant. If this becomes a possibility in the future then it may be possible to control kochia within the area using herbicides to make these slickspots available for slickspot peppergrass reintroduction.

Table 3.6 - Proposed prostrate kochia seeding in slickspot peppergrass habitat types on Federal and State Land.

Habitat Type	Alternative 2		Alternative 3		Alternative 4	
	Miles	Acres	Miles	Acres	Miles	Acres
1.5 mile buffer	26	946	20	706	6	222
Occupied	3	95	3	125	0.6	22
Slickspot Peppergrass	147	5,356	125	4,547	36	1,306

3.3.2.3 Alternative 2 – Proposed Action

Approximately 50 miles of fuel breaks would occur in occupied habitat, 25 of which are designated as proposed critical habitat for slickspot peppergrass (**Table 3.5**). If fuel breaks are fully implemented at 300 feet wide, there would be a maximum of 1,808 acres of occupied habitat surrounding 11 EOs that could be impacted by the various fuel break treatment methods;

6.3% of the occupied habitat within the project boundary and 1.6% of the occupied habitat within the Four Rivers Field Office. Roughly 5 miles of fuel breaks fall directly within known EOs; this would mean a maximum of 176 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 6,885 acres of slickspot peppergrass habitat could be impacted by fuel break treatment methods; 8.2% of slickspot habitat within the project boundary and 3.1% of the slickspot peppergrass habitat within the FRFO.

Herbicide

Herbicide treatment impacts could occur on up to 1,808 acres of occupied habitat and 6,885 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 1,632 acres of occupied habitat; this does not include acreage inside EOs themselves as targeted grazing is not allowed within the EOs. Up to 6,885 acres of slickspot peppergrass habitat could be impacted by targeted grazing.

Disking

Disking would not directly affect slickspot peppergrass EOs, but may be considered for use in occupied habitat on a site-specific basis with input from FWS and BLM botanists. A disked fuel break would be no more than 100 feet wide therefore disking could occur on up to 2,418 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 disking of fuel breaks continues.

Mechanical Thinning

Mechanical thinning in up to 1,808 acres of occupied habitat could occur on a site-specific basis with input from FWS and BLM botanists. Up to 6,885 acres of slickspot peppergrass habitat could be mechanically thinned.

Mowing

Mowing could occur in up to 1,808 acres of occupied habitat on a site-specific basis with input from FWS and BLM botanists. Mowing could occur on up to 6,885 acres of slickspot peppergrass habitat.

Prescribed Burning

Prescribed burning could occur on up to 1,808 acres of occupied habitat and 6,885 acres of slickspot peppergrass habitat.

Seeding/Prostrate Kochia

Seeding could occur on up to 1,808 acres of occupied habitat using the moderate soil disturbance techniques described in Section 2.3.2.1. Prostrate kochia could be seeded using minimal soil

disturbance techniques described in Section 2.3.2.1 on up to 6,885 acres of slickspot peppergrass habitat. Fuel breaks seeded with prostrate kochia would largely be positioned a minimum of 1.5 miles from slickspot peppergrass element occurrences with the exception of EOs 10, 21, 60, 61 and 106 (see General Effects above); therefore 95 acres of occupied habitat could be seeded with prostrate kochia.

3.3.2.4 Alternative 3 – North Boundary Adjustment

One additional mile of occupied habitat but the same mileage of proposed critical habitat could be impacted by fuel breaks in Alternative 3 as in Alternative 2. One additional EO (EO 106) would be impacted as compared to Alternative 2.

Fourteen fewer miles of fuel breaks would impact slickspot peppergrass habitat; this translates to 881 fewer acres impacted as compared to Alternative 2.

3.3.2.5 Alternative 4 – Human Ignition Areas Only

The least amount of occupied and slickspot peppergrass habitat acres, and the fewest number of EOs would be impacted by various fuel break treatment methods under Alternative 4 (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 34 fewer miles or 1,212 fewer acres of occupied habitat (Table 3.3). Six EOs would be directly impacted by this alternative; this is seven fewer than under Alternative 2. Under Alternative 4,145 fewer miles or 5,287 fewer acres of slickspot peppergrass habitat would be directly impacted as compared to Alternative 2.

3.3.3 Cumulative Effects – Special Status Plants

3.3.3.1 Scope of Analysis

The geographic scope of cumulative impacts analysis area (CIAA) would be the project area plus a 10-mile buffer to the southwest of the project area (Map 11). This area was chosen because it would encompass any slickspot peppergrass or other SSP EOs that could be impacted by proposed fuel breaks as well as those EOs that would potentially benefit from the proposed fuel breaks. 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. 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).

3.3.3.2 Current Condition and Past, Present, and Future Actions

Slickspot Peppergrass

There are 12 additional slickspot peppergrass EOs with rankings of F or higher (Colket et al. 2006) that fall within the CIAA (Table 3.7). Five EOs (1, 14, 34, 44, and 45) within the CIAA that are either ranked as historic or extirpated populations; these will not be considered in the analyses.

Table 3.7 - Slickspot peppergrass EOs that fall within the CIAA but not in the project area

Species (BLM Ranking)	EO#	Acres	Distance to edge of fuel break[1]	EO Rank[2] (year ranked)	Type of fuel break
Slickspot Peppergrass (Type 1)	2	2.5	3.2 mi (16,876 ft)	C (2005)	kochia
	27	7,159	2.8 mi (14,564 ft)	B (2005)	non-kochia
	28	0.5	2.4 mi (12,448 ft)	D (2005)	non-kochia
	50	4.2	1.4 mi (7,441 ft)	C (2005)	non-kochia
	53	40.4	8.8 mi (46,687 ft)	C (2005)	non-kochia
	67	9.6	4.8 mi (25,276 ft)	B (2005)	non-kochia
	72	67.3	1.9 mi (9,775 ft)	C (2005)	non-kochia
	77	4.2	3.4 mi (17,812 ft)	C (2005)	non-kochia
	103	0.5	3.2 mi (16,635 ft)	D (2010)	non-kochia
	104	91	0.82 mi (4,321 ft)	C (2006)	non-kochia
	111	< 0.5	7.4 mi (39,173 ft)	D (2009)	kochia

[1]Distance to edge of proposed fuel breaks if fully implemented at 300 ft wide. [2]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 Plants

Ten EOs of wovenspore lichen and fifteen Davis' peppergrass EOs fall within the CIAA (Map 11). Davis' peppergrass is a BLM Type 3 and wovenspore lichen is a Type 2 special status species plant. 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. Prostrate kochia has been observed to colonize the playas in which Davis' peppergrass is found (DeBolt 2002, Tuason 2005). However, it is highly unlikely that prostrate kochia seeded for the Paradigm fuel breaks project could disperse 4.5 miles against prevailing winds and establish within the playas.

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 11). Fuel break implementation is unlikely to impact these species.

Actions that have had or could in the future impact slickspot peppergrass and other SSPs within the CIAA include wildfire, invasion by non-native annual plants and noxious weeds, urban and agricultural development, fuel break implementation on private land, and energy infrastructure. Livestock use, past post-fire rehabilitation drill seeding without depth bands, military training, and recreation could also result in negative, though localized, effects to slickspot peppergrass. Climate change could also impact 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, as well as other SSPs within the project area is described in the Section 3.2.1.

General

Current safeguards strive to protect slickspot peppergrass EOs, occupied, proposed critical, and slickspot peppergrass habitat, as well as other SSPs against the negative effects of actions within the CIAA, however some impacts could still occur. Wildfires, post-fire rehabilitation, and livestock grazing and trailing have led to increased invasive annual grasses and forbs in EOs and habitat. As invasive annual grasses and forbs 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 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 past post-fire rehabilitation equipment, firefighting, and livestock grazing and trailing, in slickspot peppergrass EOs, occupied, and slickspot peppergrass habitat within the project area. 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 annual plants from past activities can also degrade pollinator habitat and change pollinator behavior.

Residential Development (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. Potential habitat on BLM land was surveyed in 2010; no slickspots were found in the area. 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).

Fuels Breaks on Private Land
The NRCS will be working with landowners within the project area to develop fuel breaks on private land to connect with BLM fuel breaks. Depending on landowner participation, up to 213 miles of fuel breaks could be developed for fuel breaks to complete the network of fuel breaks across the landscape. Impacts to slickspot peppergrass EOs, occupied habitat, and slickspot peppergrass habitat would be similar to those described in Section 3.2.2. Landowners working in cooperation with the NRCS to develop fuel breaks on private land would adhere to BLM design features (2.3.2.2) to limit impacts to slickspot peppergrass.

Transmission Line Development (Gateway West)
A portion of the preferred fuel break location for Segment 8 of the Gateway West transmission line project (GWW) is within the proposed project boundary (Map 12). Section 7 conference for GWW was completed in 2013 (USBLM 2013). The BLM will examine the proposed updated Segments of the project to determine if Section 7 conference needs to be reinitiated. All Consultation and NEPA documentation is planned to be completed by the fall of 2015 (T. Roller, personal communication, 2014).

Within the CIAA the proposed transmission line could cross through occupied habitat and slickspot peppergrass EOs, slickspot peppergrass habitat, and potential habitat. 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 would 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).

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 would not be stored in or spread on slickspots

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

3.3.3.3 Alternatives 2-4 – Action Alternatives

Effects of the proposed project on special status plants within the CIAA are the same as is discussed above in Section 3.3.2 above. Prostrate kochia would not be planted within 1.5 miles of slickspot peppergrass EOs 2, 27, 28, 50, 53, 67, 72, 77, 103, 104 or 111. Prostrate kochia would be planted 1.1 miles from slickspot peppergrass EO 10 as previously discussed.

The proposed GWW ROW could intersect proposed fuel breaks in some locations. The additive impact of fuel breaks on slickspot peppergrass and its habitats 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.

Invasive annual grasses and forbs 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 intersection areas. 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. When implemented, GWW would add to this soil deposition.

3.4 Wildlife (including Special Status Animals)

3.4.1 Affected Environment – Wildlife

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 but the wildlife analysis for this EA does not include all species occurring in 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. Redband trout habitat is identified in the project area (Map 15). However, because no fuel breaks would be developed within riparian areas, effects to redband trout are not analyzed.

All species being analyzed are identified as special status animals (SSA) with the exception of mule deer, and they have been documented or are expected to occur within the project area. The species selected for analysis include:

- Greater Sage-grouse
- 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).

In spring of 2012, there were 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). However, wildfires in 2012 and 2013 burned just over 11,000 acres of PGH in the project area so that now there are approximately 13,667 acres of PGH remaining. 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 (power lines, 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 and 19 leks within ten miles of the project perimeter (Table 3.8, Maps 13 and 14). Only one of the five leks within the project boundary is occupied and active, and the other four have not had birds present for several years. Of the 19 leks located within 10 miles of the project boundary, only three are considered occupied and active. A sage-grouse lek is not considered unoccupied until after five years of being inactive. Lek surveys completed in 2014 included the one occupied lek within the project area and three others within ten miles of the project area. Results of those surveys documented birds on three of the leks surveyed, not including the lek within the project area. Table 3.6 illustrates the loss of active leks and current numbers for those that are still occupied and active.

The Pony Complex burned approximately 135,231 acres north of the project area and consumed thousands of acres of PPH and PGH. The fire burned over two occupied 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. Map 14 illustrates the PPH and PGH that have burned in and near the project area from 2010 through 2013.

Table 3.8 - 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	2014/0
E022	1951/11	1972/0	2011/0
E050[3]	1969/33	1976/0	2014/0
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	2014/5
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	2014/7
E071	2011/6	2012/2	2014/0

[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] E050 and E051 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 (ISAC) 2006; USFWS 2010a). There is very little suitable sage-grouse habitat remaining in the project area and where sagebrush is present, it often has cheatgrass and medusahead in the understory. Furthermore, 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. All leks within and adjacent to the project area have had several fires occur within 33.5 miles.

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 13). 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. Additionally, several other golden eagle nests have been documented the throughout the project area but outside of the SRBP on electrical transmission towers and on cliffs near the Snake River Canyon. Monitoring for most of these nests has not occurred for several years.

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 rabbitbrush) 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 cheatgrass and medusahead 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 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 13). 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 native 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 the Idaho Department of Fish and Game (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 is mainly used by mule deer during winter months, although the level of use is limited except in areas that still have shrubs present. In the past, much of the project and surrounding area consisted of sagebrush which provided important winter forage and thermal cover. The project area west of Mtn. Home and a small portion to the east is currently classified as big game winter range, although recent fires have impacted those areas. Throughout the project and surrounding area, suitable winter habitat for mule deer as well as Rocky Mountain elk and pronghorn antelope has decreased dramatically due to fire and invasion by annual grasses and forbs.

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. Because so much of the winter habitat has been burned, there are increased levels of problems with ungulate species, mainly elk, consuming feed for livestock. To lessen conflict between landowners and wildlife, Idaho Fish and Game has increased hunting opportunity to reduce the elk population.

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 and findings from Steenhof et al. (2006) confirmed shrub habitats provide more favorable environments for squirrels than grass habitats within the SRBP. Forage includes green vegetation, native grasses and their seeds and a few insects. The greatest amount of food is consumed in early morning (Alcorn 1940). 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.

This species excavates two distinct burrow systems, shallow burrows and deep burrows (Alcorn 1940). Shallow burrows are auxiliary systems used for hiding and are usually close to good feeding areas. The main burrows, or home burrows are deeper and more complex than shallow systems. In a study completed in Nevada, Alcorn (1940) found the average depth of shallow burrows was 15.5" deep with an average length of 127". He found deep burrow systems had an average depth of 38" and an average length of 321".

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 (USFWS 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 large contiguous patches of sagebrush are lacking due to the many fires that have occurred and the subsequent invasion of annual grasses. Some areas with dense sagebrush cover preferred by this species are found within the project area but they are limited in size and frequency.

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 behavior 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.

3.4.2 Environmental Consequences – Wildlife

Impacts from the tools being proposed for fuel break development would be similar for each alternative. 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 annual vegetation. In other words, the risk of losing thousands of acres of wildlife habitat, not just within the proposed fuel breaks but across the landscape, outweighs the risks associated with the creation of fuel breaks and provides a management opportunity to more effectively protect habitat across the landscape. Each subsequent wildfire in and adjacent to the project area results in further loss and degradation of wildlife habitat by increasing the spread and dominance of invasive annual grasses and forbs and the likelihood of future fires.

3.4.2.1 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 travel routes would not be enhanced. Because there would be no changes to improve fire management in the project area, the analysis for this alternative addresses the effects of continued burning of habitat and spread of invasive annual vegetation.

Greater Sage-grouse
Conditions for this species would be expected to continue to degrade in the project area due to the presence and resulting spread of invasive annual grasses such as cheatgrass and medusahead,

and increased fire frequency (Balch et al. 2013). Even in 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). Cheatgrass-dominated grasslands without sagebrush represent an undesirable endpoint that remains stable because recurrent fires prevent re-establishment by sagebrush, native forbs and grasses (Knick and Hanser 2011). Without establishing fuel breaks, there is a greater likelihood of this species being extirpated in and adjacent to the project area.

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. (2000) cites studies suggesting golden eagles in the SRBP have been adversely affected by changes in prey species abundance as a result of annual grassland expansion and corresponding loss of sagebrush cover. Black-tailed jackrabbit population declines were closely correlated with a loss of sagebrush cover, and current distribution was related to remaining habitat (Sands et al. 2000). 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

Cox (2008) provided data strongly suggesting habitat loss from fire and cheatgrass invasion was the primary cause of large reductions in mule deer populations in Nevada. While mule deer do forage on cheatgrass, it does not provide thermal or hiding cover. Recurring fire within and adjacent to the project area would continue to reduce suitable winter habitat and remaining unburned habitat would be degraded by increased levels of use. Continued loss of winter habitat would lead to higher levels of conflict between ranchers and wildlife, especially elk.

Piute Ground Squirrel

Wildfire in the project area removes the preferred shrub habitat for this species and leads to increases in invasive annual grasses. 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 increased dominance of invasive annual grasses and forbs within the project area would negatively impact this species and the raptor species that prey upon them.

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). Future fires that consume sagebrush within the project area would further reduce the habitat. Additionally, continued burning within the project area prevents shrub recovery and allows invasive annual grasses and forbs to increase, 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). 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), and beetles (Rickard 1970). Longnose snakes feed mostly on lizards and small mammals which have been shown to have reduced abundance in areas dominated by cheatgrass. While Hall et al. (2009) did not study longnose snakes; the results would likely be similar for this species due to reduced numbers of prey and the loss of suitable habitat.

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).

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 reduce available cover and likely negatively impact mobility of western toad. Conversion of areas to cheatgrass and medusahead would also reduce prey species. Therefore, while direct impacts from fire may be minimal to western toad, the loss of habitat to annual vegetation following fire would likely have long-term negative impacts for this sensitive species.

3.4.2.2 General Effects of Action Alternatives

The potential effects of each method or tool proposed for use in each of the alternatives is discussed below. Concern about habitat fragmentation was expressed in comments received during the Draft EA review; however, impacts of fragmentation would be less than the level of fragmentation that has been caused by wildfire and the spread of cheatgrass and medusahead. Of the proposed methods, disking poses the highest likelihood for causing fragmentation for some species (small mammals, amphibians, and reptiles) due to the loss of cover. Impacts from disking to prepare an area for seeding would be short-term, however, if disking were selected and used as the sole method to establish fuel breaks there would be long-term bare soil areas that would likely negatively impact some species. Other proposed methods would leave some level of cover in the fuel break. The proposed action would treat the most acres of all the alternatives, which is approximately 4.4% of the project area. However, as identified previously, the maximum treatment acres by alternative would not be realized due to terrain, geology, and resource concerns, and the area would not all be treated at the same time.

<u>Herbicides</u>

Potential impacts of the chemical treatment to wildlife vary depending on type of herbicide and the duration and mechanism of exposure. Herbicide effects to wildlife are described in the *Vegetation Treatments using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* (PEIS) (USDI BLM 2007a). 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 2007b). 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. Herbicide use may cover several miles of fuel breaks but treatments would be of short duration and may only occur every 2nd or 3rd year until desirable vegetation becomes established.

The PEIS states that risks from direct spray and spills, indirect contact with foliage after direct spray, and ingestion of contaminated food items after direct spray are generally low or non-existent for terrestrial fauna, with few exceptions, particularly for mammalian herbivores and pollinating insects Table 3.9. 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, the PEIS states that harmful doses of herbicide are not likely unless the animal forages exclusively in the treatment area for an entire day (USDI BLM 2007a).

Imazapic would be the most widely used herbicide in the fuel breaks due to its effectiveness on invasive annual grasses. Imazapic poses no risks to wildlife. The remaining herbicides would be used to target noxious weeds and therefore used to a much lesser extent within fuel breaks since noxious weeds are not nearly as prevalent as invasive annual grasses and forbs. The probability of harmful contamination is further reduced by the minimal area treated compared to the large landscape in the project area. Based on the analyses and findings presented in the PEIS

(USDI BLM 2007a), and the rationale presented in the bulleted statements below, the actual risk of adverse effects to wildlife due to contamination from herbicide treatment proposed with the action alternatives is low. The rationale for this determination includes:

- Herbicides would be applied according to the standard operating procedures (see Appendix Section 7.5) from the *Vegetation Treatments using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* (USDI BLM 2007a, Appendix B),
- Herbicides with the lowest likelihood of impacting wildlife would be used whenever possible. Herbicides that can cause harmful effects to wildlife would not be applied at the maximum rate,
- The majority of the herbicides proposed for use have no or low levels of risk,
- The developed fuel breaks where herbicides would be applied represents a small fraction of the area available for wildlife,
- It is unlikely that animals would forage for an entire day in areas treated by herbicides because fuel breaks would be adjacent to roads with reduced hiding cover and the roads have higher levels of human activity.

While the level of risk is low, adverse effects to wildlife could occur; but reducing the negative impacts from non-native vegetation and noxious weeds would lead to improved conditions for wildlife across the landscape. The benefits of using herbicides outweigh the associated risks and the impacts from continued loss of habitat to wildfire and invasive vegetation. These general effects apply to all the wildlife species discussed below. Some more specific information is provided where warranted.

Table 3.9 - 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		CHLOR		DICAMB		CLOP[1]		METS[1]		PICL[1]		TRIC[1]		IMAZ[1]		GLYP[1]	
	Typ	Max	Typ	Max	Typ	Max	Typ	Max	Typ	Max	Typ	Max	Typ	Max	Typ	Max	Typ	Ma
Direct Spray of Terrestrial Wildlife																		
Small mammal – 1st order dermal	L[3]	L	0	0	0	0	0	0	0	0	0	0	L	M	0	0	0	0
Small mammal – 100% absorption	M	M	0	0	0	0	L	L	0	L	L	L	L	M	0	0	L	M
Pollinating insect – 100% absorption	M	M	0	0	0	L	0	L	0	0	0	L	L	M	0	0	L	M
Indirect Contact with Foliage After Direct Spray																		
Small mammal – 100% absorption	L	L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	L
Pollinating insect – 100% absorption	L	L	0	0	0	0	0	0	0	0	0	0	0	L	0	0	0	L
Small mammal – 1st order dermal Absorption	0	0	0	0	0	0	0	0	0	0	0	0	0	L	0	0	0	0
Ingestion of Food Items Contaminated by Direct Spray																		
Consumption of contaminated small mammal, predatory bird –	L	L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Small mammalian herbivore – acute	L	L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Small mammalian herbivore –	L	L	0	0	0	L	0	0	0	0	0	0	0	0	0	0	0	L
Large mammalian herbivore – acute	M	M	0	0	0	L	L	L	0	L	L	M	L	M	0	0	L	M
Large mammalian herbivore –	M	M	0	0	L	M	0	L	0	0	0	0	0	L	0	0	0	L
Small avian insectivore – acute	H	H	0	0	0	0	0	0	0	0	0	0	L	M	0	0	L	M
Large avian herbivore – acute	M	M	0	0	0	0	0	0	0	0	0	L	0	0	0	0	0	0
Large avian herbivore – chronic, on-	M	H	0	0	0	0	0	0	0	0	0	L	L	M	0	0	L	L

1 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); 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 (Holloran et al. 2010). The project design feature specifying that no work be completed within 3 miles of an occupied lek during the breeding and nesting period, further reduces risks to sage-grouse.

Fuel breaks would not fragment habitat to a level that would preclude sage-grouse from accessing suitable habitat. This determination is 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 (Moser et al. 2012). Between April 2011 and July 2012, two of the sage-grouse being tracked crossed Hwy 20 six times and another sage-grouse crossed the highway four times. While sage-grouse normally avoid anthropogenic features, the highway intersects historic migration routes. Seven of the 10 birds being tracked crossed Hwy 20 and the three that didn't died before the migration period. 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 in width with much less vehicle traffic and human activity.

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 the findings from two years of telemetry data that indicate sage-grouse utilization of the project area 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 non-native annual vegetation, and the presence of human infrastructure and activity. While Graham (2013) states that fuel breaks should be design to minimize loss of sagebrush in winter habitat when creating fuel breaks and project design features have been incorporated for that reason. Additionally, the number of acres of sagebrush habitat that could be impacted by creating fuel breaks is a small fraction of the acres of sagebrush that have been consumed by wildfire in recent years. The fires in 2013 consumed thousands of acres of sage-grouse habitat both within and outside of the project area leading to even greater levels of habitat fragmentation.

Graham (2013) also noted that sagebrush habitat that has burned and then become dominated by annual grasslands can be lost forever. The proposed action would reduce the potential of wildfire and subsequent spread of invasive annual grass that may never be returned to sagebrush. Additionally, the potential benefits of reducing wildfire and its negative and long-term impacts across the landscape outweigh the risks of establishing fuel breaks.

<u>Disking</u>
While establishing bare soil fuel breaks could occur, this type of fuel break would likely be used in few places due to resource concerns. Disked fuel breaks would not be established in PPH or PGH. Areas outside of PGH could have disked fuel breaks up to 100 feet.

Bare soil fuel breaks up to 100 feet wide on both sides of a road would lead to areas devoid of vegetative cover over an area wider than 200 feet. However, there would be no measurable effects to

sage-grouse from permanent bare soil fuel breaks. This determination is based on the following rationale:

- Permanent disked/bare soil fuel breaks would not be established in PPH or PGH.
- There is limited use of the project area by sage-grouse.
- This type of fuel break would only be used as a last resort or a limited basis.
- Sage-grouse have been documented to readily cross open areas including Highway 20, which has much more traffic than other roads in the project area except I-84.

Mechanical Thinning and Mowing

As identified in the design features, mow strips in PPH or within one mile of an active occupied sage-grouse lek would not be wider than 50 feet. Beyond the 50 feet of mowing in PPH, sagebrush may be thinned by hand to approximately 5 - 10% canopy cover for an additional 50 feet. Mow strips in PGH would be no wider than 100 feet. Sagebrush may be thinned by hand beyond the in PGH to approximately 5 - 10% canopy cover for an additional 100 feet.

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. Graham (2013) documented sage-grouse expanding a lek site into adjacent areas where treatment of sagebrush had occurred. 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 (Graham 2013).

Herbicides

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. Effects of herbicide application within the project area to sage-grouse would be negligible based on the general Herbicide information and the following:

- Sage-grouse use of the project area is low and mainly occurs in the winter when herbicide application would not occur,
- Sage-grouse forage exclusively on sagebrush (USFWS 2010a), which would not be targeted for herbicide treatment,
- The low level of sagebrush within the proposed fuel breaks where herbicides would be applied reduces the likelihood of sage-grouse foraging and loafing in treated areas.

Targeted Livestock Grazing

Due to the concentration of livestock, increased human presence, and the temporary fencing required for targeted grazing, this method would not be used within 3 miles of an active sage-grouse lek from March 1st through July 31st. Targeted grazing to establish fuel breaks would only occur in areas where other methods would not feasible and few, if any such areas exist. 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 that would be required to maintain livestock in the fuel break area. While collisions with temporary fences could occur, the low level of sage-grouse use within the project area and marking the fence wires to make them more visible reduces the probability of collisions. Marking fence wires has been shown to reduce collisions by 70% to 83% (Christiansen 2009; Stevens et al. 2012). Additionally, the number of sage-grouse hens, if any, nesting in the project area further

reduces potential of impacts occurring from targeted grazing. Impacts to sage-grouse from targeted grazing would be negligible due to project design features and the low level of use by sage-grouse.

Prescribed Fire

There would be no measurable impacts from this treatment other than temporary disturbance. This is based on the limited use of the project area by sage-grouse, the prescribed fires would be restricted within a small narrow strip along roadways, and the birds would leave the area due to the fire and the presence of fire fighters and equipment.

Seeding/Prostrate Kochia

Vegetated fuel breaks could be up to 100 feet wide in PPH and 200 feet wide in PGH which could reduce sagebrush. Prostrate kochia fuel breaks established in PPH and PGH would not negatively impact sage-grouse. While sagebrush cover would be reduced 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 (Graham 2013; Paul Makela 2013, personal communication). Graham (2013) documented sage-grouse expanding a lek site into a fuel break planted with prostrate kochia, furthermore, she documented that prostrate kochia comprised a small portion of the sage-grouse diet.

Graham (2013) indicated that climate models indicate an increase in daily and nightly temperatures and an increase in evapotranspiration rates throughout the western US. She also suggests that prostrate kochia provides is ecological bridge species that is drought-resistant and can reduce spread of fire and subsequent invasive plants necessary to protect remaining sagebrush ecosystems. Creating greenstrips with prostrate kochia can help maintain sagebrush habitats by reducing the spread of wildfire and thus reducing the ecological transition from sagebrush shrublands to annual grasslands that are dominated by invasive species. Protecting sagebrush habitats is critical for maintaining sagebrush obligate species and overall biodiversity (Graham 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.

Golden Eagle and Ferruginous Hawk

The development of fuel breaks would not lead to measurable short or long-term negative effects to golden eagles or ferruginous hawks. The likelihood of mortality or injury from implementation is minimal because raptors would avoid machinery and workers. Disturbance during breeding and nesting would not occur due to buffers and timing restrictions 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.

Disking

Bare soil fuel breaks created by disking would not have direct effects to these raptor species and the likelihood of indirect effects would be minimal due to resource concerns that limit this type of fuel break. Even if bare soil fuel breaks established by disking were to occur on a large scale, the number of acres impacted would be a small fraction compared the number of acres that continue to burn within the project area.

Herbicides
Common prey of golden eagle and ferruginous hawk has a low probability of contamination from the herbicides proposed for use. The herbicide 2,4-D poses a low risk of adverse effects to predatory birds consuming contaminated small mammals. There are thousands of acres throughout the area 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 for this alternative would be low.

Targeted Livestock Grazing
This method would not have direct impacts to raptors but an indirect effect could result from collisions with temporary fences. Marking the wires of fences dramatically increases the visibility of wire fences for wildlife, especially birds (Paige 2012). Due to the concentration of livestock and increased human activity associated with targeted grazing and fence marking, there would be no measurable impact to raptors.

Prescribed Fire
There would be no measurable impacts from this treatment other than temporary disturbance.

Seeding/Prostrate kochia
Establishment of fuel breaks using prostrate kochia would have no negative direct impacts to golden eagle or ferruginous hawk. An indirect benefit would be that prey species, including black-tailed jackrabbit and Piute ground squirrel, would benefit from establishment of prostrate kochia. Rabbits have been shown to utilize prostrate kochia as forage. Piute ground squirrels have been documented within existing kochia fuel breaks and it likely provides valuable forage.

Mule Deer
There would be few direct impacts associated with the development and maintenance of fuel breaks in the project area. Mule deer, antelope, and elk may be disturbed by vehicles and other implementation tools but they could simply move from the disturbance. Temporary fencing associated with project implementation may also negatively impact mule deer and other ungulates. However, all temporary fences would be marked, reducing the likelihood of mortality and injury to mule deer. Making a fence highly visible prevents collisions, and helps animals judge the height of a fence for jumping (Paige 2012). Indirect effects from project implementation would also be negligible as explained below. Reducing wildfire and the spread of invasive annual grasses and forbs in and adjacent to the project area would improve habitat conditions and benefit mule deer and other large ungulates.

Disking
Bare soil fuel breaks created by disking would have little effect on mule deer because this method would only be used in a few places and because the deer would have no issues crossing such fuel breaks. It would likely benefit deer by reducing the amount of time they mingle near roadsides and by improving their visibility to drivers.

Mechanical Thinning and Mowing
This would reduce the amount of shrubs used for forage and cover by mule deer. However, there would still be vegetation within mowed fuel breaks that deer could forage on. The reduced cover would likely decrease the amount of time deer would forage and mingle adjacent to roads and the shorter vegetation would make them easier to see by drivers. The number of acres that may be mowed to create fuel breaks would be a small fraction to the acres that have burned and become dominated by

cheatgrass and medusahead. The negative effects of wildfire and continued loss of sagebrush habitat across thousands of acres in and adjacent to the project area far outweigh any impacts that could occur from development of fuel breaks.

Herbicides

Effects of herbicide application within the project area to mule deer would be negligible as herbicide use would occur when most deer are on their summer range outside of the project area.

Targeted Livestock Grazing

Mule deer may be temporarily displaced while there are concentrations of livestock present in an area. There would be less forage for deer and other ungulates in grazed fuel breaks. However, there would be plenty of forage available outside of the grazed fuel breaks.

Prescribed Fire

This action used to prepare an area for seeding would have no effects to mule deer or other ungulates other than temporary displacement during the day of implementation.

Seeding/Prostrate Kochia

Fuel breaks consisting of prostrate kochia would provide a valuable food source during winter months for ungulates in the area and alternate vegetation proposed may attract ungulates to fuel breaks. There is a potential for increased incidence of collision induced mortality by establishment of seedings 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 and seedings using other vegetation have also been completed 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. 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 or alternate fuel break vegetation would be planted across many miles of the project area away from Highway 20 and I-84, which would lessen the draw of ungulates to those specific areas. Roadsides with low growing vegetation established in fuel breaks would likely make ungulates more visible to drivers. Fuel breaks of prostrate kochia or alternate vegetation would benefit mule deer in areas dominated by annual grasses and forbs.

Kochia fuel breaks would also provide ungulates with a valuable source of protein during the winter months, especially since so much winter habitat has been burned by recent wildfires.

Piute Ground Squirrel

Disking

Disking down to depths of 9" could occur in some areas, although the depth of most disking would be around 6" deep. The average depth of shallow burrow systems is 15" and 38" for deep burrows. Disking over occupied shallow burrow may cause injury and mortality to squirrels but disking over the home or deep burrow systems would not cause harm. Disking would not occur from March 1st through July 31st which further reduces the likelihood of adverse effects. During most of this time period that disking could occur, squirrels would be hibernating in their deep burrows. Before hibernating, these squirrels plug their holes to protect themselves from predators and for temperature control and any damage occurring to burrows would not compact the soil.

If permanent fuel breaks were created by disking, they would not provide habitat for Piute ground squirrels and crossing the disked areas would make them more susceptible to predation. However, maintaining the existing condition of low levels of shrubs and areas dominated by non-native annual grasses, and the continuation of frequent wildfires would have greater long-term negative impacts to squirrel populations than the impacts associated with disking.

Mechanical Thinning and Mowing

There would be little likelihood of injury or mortality to ground squirrels from mowing or hand thinning of sagebrush. Mowing would occur in late summer into the winter and squirrels would be hibernating. 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.

Herbicides

Effects of herbicide application within the project area to Piute ground squirrel would be negligible as direct spray of Piute ground squirrels with herbicide is unlikely. Squirrels would retreat to the protection of their burrows when disturbed by personnel and equipment during application of herbicides.

Targeted Livestock Grazing

Disturbance to Piute ground squirrels from targeted livestock grazing would not occur but negative effects could occur through competition for forage and loss of cover. If this method is employed, the potential negative effects would be confined to a small percentage of the proposed fuel breaks. Shrub cover would remain, but cover from grasses and forbs would be minimal. Squirrel use in areas treated by targeted grazing may 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 be utilized to prepare for seeding in areas with thick infestations of annual grasses. Areas of cheatgrass and medusahead provide poor habitat for Piute ground squirrels (Yensen and Sherman 2003), and densities are often low in annual grasslands (Yensen et al. 1992). Prescribed fire for seedbed preparation would occur in late summer and fall while squirrels are hibernating. Using prescribed fire to prepare an area for seeding would have no effect to this species.

Seeding/Prostrate Kochia

General

At the time seeding would be implemented (fall through early winter) Piute ground squirrels would be hibernating. 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.

Prostrate kochia

Establishing prostrate kochia fuel breaks would reduce cover in areas where stands of sagebrush and other shrubs currently exist but the acres of shrubs within proposed fuel breaks is low. In contrast, establishing prostrate kochia in areas where invasive annual grasses are present would improve habitat conditions and benefit this species. While no studies to date have been completed on the effects of prostrate kochia on ground squirrels, Piute ground squirrels have been observed existing in high numbers within fuel breaks of prostrate kochia (Simco Road). 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 cheatgrass, medusahead, and other invasive species, the proposed fuel breaks of prostrate kochia would be beneficial to squirrels. This is because prostrate kochia competes well with annual grasses and forbs, effectively helps control wildfire, and provides high protein forage.

Brewer's Sparrow

Reducing the frequency and size of wildfire in the project area would benefit migratory birds by allowing time for desirable vegetation to become established. Overall, the likelihood of measurable negative effects, including fragmentation, to Brewer's sparrow is low due the limited amount of shrub habitat in the project area that would be impacted from the proposed action. Sagebrush stands that are present in the project area often don't provide good habitat because they have understory vegetation consisting of burr buttercup or non-native annuals. Treatment of areas occupied by sagebrush would not occur during the breeding and nesting season.

Ingelfinger and Anderson (2004) found that within a 300-foot zone along dirt roads regardless of traffic volume, there was a 60% reduction of sagebrush obligate bird species when compared to areas outside the 300 foot zone. They found a 36% reduction in presence of Brewer's sparrow within 300 feet of dirt roads. Even along an unused dirt road, they found sage sparrow usage within the study zone was reduced by 64%. This indicates that for sagebrush obligate bird species habitat within 300 feet of dirt roads is less suitable than similar habitat further away. The study did not provide incremental analysis of habitat use of birds near roads. It is likely that for those species impacted by the presence of roads, habitat use increases the further birds are from a road. For example, Brewer's sparrow may avoid

habitat within the first 25 or 50 feet from a road, have low levels of use from 50 to 100 feet from a road, and higher levels of use further from the road.

Disking

Disking could cause negative impacts to migratory birds that construct their nests on the ground. To mitigate that concern, there would be no disking from March 1st through July 31st. There would be no direct effects from disking. Permanent bare soil fuel breaks would provide no habitat for migratory birds that utilize the project area.

Mechanical Thinning and Mowing

This method would not be used from March 1st through July 31st which would protect nesting birds. Because of the timing restriction there would be a negligible level of direct effects. Where this method does occur, habitat would be reduced for migratory birds that prefer shrub habitat but because this habitat would be near roads there would be less likelihood of measurable effects. Mowing would increase habitat for birds that prefer more open habitats and those that are ground nesters.

Herbicides

Of the herbicides that could be used, 2,4-D, Triclopyr, and Metsulfuron pose the highest level of risk to Brewer's sparrow and other migratory birds that would be foraging on and feeding their young with insects. However, these herbicides most likely be used to treat small areas with noxious weeds, which reduces the likelihood of contamination. While there is risk to migratory birds when using herbicides, the realization of impacts to migratory birds would be low based on the following:

- These herbicides would most often be applied to treat small areas (spot treatments) of noxious weeds.
- The treatment areas would be near roads where there are reduced levels of bird activity

Targeted Grazing

This action would occur during the breeding season of migratory birds and there would be potential for impacts to migratory birds. Birds that prefer grassland habitats such as meadowlarks and horned larks would be most susceptible because their nests are located on the ground and there are many acres of suitable habitat within proposed fuel breaks. Potential impacts include disturbance, trampling of nests, knocking eggs or young birds out of nests located in shrubs, collisions with temporary fencing, and reduced cover making nests and birds more vulnerable to predation. The likelihood of these negative effects is low because this method would only be utilized where other methods could not be used such as steep rocky areas, and there are few such areas within the project. Other resource concerns also restrict where this method could be used including cultural, special status plants, and sage-grouse.

Prescribed Fire

There would be no impacts to migratory birds from using prescribed fire to prepare an area for seeding other than temporary disturbance. Prescribed fire would occur after migratory birds have finished reproductive efforts and many will have already migrated from the area. Birds could easily avoid the prescribed fires and would likely be pushed from the area by the presence and activity of fire personnel.

Seeding/Prostrate kochia

Prostrate kochia fuel breaks or other vegetation proposed for fuel breaks would not provide suitable shrub habitat for Brewer's sparrow or other migratory birds. Removal or alteration of sagebrush would reduce potential habitat although the number of acres of suitable habitat within proposed fuel breaks is low and habitat near roads is not readily utilized. Treatment of shrubs would not occur during the

nesting period for migratory birds. Design features reduce the number of acres of shrub habitat that could be altered or removed for fuel break development. Any of the proposed plant species for fuel breaks would be better than areas infested with non-native annual grasses.

Fuel break development in areas outside of shrub habitat would have minimal negative impacts to migratory birds other than temporary disturbance. Birds that prefer grasslands may see a reduction of habitat but there is no shortage of such habitat across the project area. The potential for direct mortality is low due to the high mobility of birds. Creation of fuel breaks may lead to short-term displacement due to the presence of humans and mechanized equipment.

Longnose Snake and Western Toad

There could be negative impacts to these species and other herpetofauna[2] during project implementation but most species would seek refuge underground which would protect them from harm for most proposed methods of fuel break development. There would be long-term benefits from reducing wildfire and the establishment of non-native vegetation.

Disking

Disking could harm or herpetofauna that do not move from the area or get underground deep enough to keep from getting hit by disks. Disking would not occur from March 1st through July 31st, and most disking would occur in fall and winter when reptiles are less active or hibernating. Areas disked for seeding would increase vulnerability of these species to predation until vegetation is established. Permanent bare soil fuel breaks would have long-term effects by creating areas of unsuitable habitat for longnose snake, western toad and other species due to reduced prey densities, lack of cover, and increased vulnerability to predators.

Mechanical Thinning and Mowing

Mowing could harm herpetofauna that did not move away or seek refuge underground. Mowing would not occur from March 1st through July 31st. The height of cover would be reduced by mowing and the amount of cover would be reduced by thinning but cover would still be present. Mowing and followed up with herbicide treatment to control non-native vegetation would lead to increased levels of cover from native vegetation such as forbs and bunchgrasses, leading to improved habitat for reptiles and amphibians.

Herbicides

Negative effects to herpetofauna from herbicides could occur from being directly sprayed, dermal contact with sprayed vegetation (Table 3.9), or from ingesting contaminated prey (Table 3.10) when 2,4-D, Clopyralid, Glyphosate, Metsulfuron, Picloram, or Triclopyr are used. While there are risks associated with herbicide use, treatments would benefit wildlife through the control of invasive species. As discussed above, the risks of adverse effects to these species would be low. Additionally, the expected benefits of controlling invasive vegetation within the project area outweigh the risks of potential effects.

[2] *Herpetofauna refers to the reptiles and amphibians of a particular region.*

Table 3.10 - Summary of Effects[1] to Threatened, Endangered, and Proposed Terrestrial Vertebrates from Dermal Exposure to Herbicides, as Predicted By Risk Assessments (USDI BLM 2007b)

Herbicide	Direct Spray	Level of Risk[2]	Dermal Contact with Sprayed Vegetation	Level of Risk
2,4-D	Negative effects	Typical rate: M Maximum rate terrestrial: M	Negative effects	Typical rate: L Maximum rate terrestrial: L
Chlorsulfuron	No effects	--	No effects	--
Clopyralid	Negative effects	Typical rate: L Maximum rate: L	No effects	--
Dicamba	No effects	--	No effects	--
Glyphosate	Negative effects	Typical rate: L Maximum rate: M	Negative effects	Typical rate: N/A Maximum rate: L
Imazapic	No effects	--	No effects	--
Metsulfuron	Negative effects	Typical rate: N/A Maximum rate: L	No effects	--
Picloram	Negative effects	Typical rate: L Maximum rate: L	No effects	--
Triclopyr	Negative effects	Typical rate: L Maximum rate: M	Negative effects	Typical rate: N/A Maximum rate: L

[1]Both acute and chronic effects were considered, and "negative effects" include either acute or chronic effects, or both. For more information on acute vs. chronic effects, please see Appendix C of the PEIS. "No effects" indicates that ERAs did not predict risks to TEP terrestrial vertebrates under the modeled scenario at typical or maximum application rates.

[2] L = Low risk; M = medium risk; H = high risk; N/A = ERAs did not predict risk at this application rate.

Table 3.11 - 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

Targeted Livestock Grazing

Effects from targeted grazing would be a reduction of cover and disturbance, and trampling could potentially occur. Reduced cover and disturbance would be short-term impacts. This method would be used over a limited area and over a short period of time. There would be no measurable effects to herpetofauna populations from this method.

Prescribed Fire

While there could be adverse effects to reptiles and amphibians from prescribed fire. Most species likely take refuge underground or in water, while more mobile species may initially try to escape by quickly moving away. Most of the fuel breaks that would be burned consist of very light, quick burning fuels. The low intensity and severity of prescribed fire would have minimal impacts to reptiles.

Seeding/Prostrate Kochia
Establishment of seeded fuel breaks could cause direct effects to herpetofauna from tractors and seeding implements. However, seeding would take place in fall and winter when these species are less active or hibernating, which greatly reduces the risks. Effective kochia or other vegetated fuel breaks would provide low levels of cover for herpetofauna, especially until they become established. However, seeded fuel breaks would provide more suitable habitat than cheatgrass or medusahead for both reptiles and their prey species (See Longnose Snake in the analysis of the No Action alternative).

3.4.2.3 Alternative 2 – Proposed Action

Development of 356 miles of fuel breaks at the maximum proposed width of 300' would equal nearly 12,878 acres. However, due to guidelines, regulations, and concerns for slickspot peppergrass, and cultural, visual, and wildlife resources, there would be restrictions precluding implementation of the maximum width and the total acres impacted would be less than 12,878. While this alternative proposes the greatest miles and acres of fuel breaks, it would also provide the greatest likelihood of improving wildlife habitat across the project area.

In 2007, Tagestad and Downs updated a 2002 vegetation mapping effort utilizing Landsat satellite imagery, which included the project area. Based on their analysis, approximately 23% of the project area was identified as big sagebrush and 12% as big sagebrush mix or approximately 102,862 acres within the project area, of which, approximately 7145 acres are within the proposed fuel breaks. Since their 2007 analysis, approximately 14,495 acres of big sagebrush and 8,310 acres of big sagebrush mix have burned within the project area. This has reduced the amount of sagebrush habitat to 80,057 acres.

Greater Sage-grouse
There are approximately 183 acres of PPH and 536 acres of PGH of big sagebrush/big sagebrush mix (big sagebrush/mix) vegetation in the proposed fuel breaks. Approximately 4,000 acres of big sagebrush/mix are in the proposed fuel breaks outside of PPH and PGH. These acres are calculated based on 300 feet wide fuel breaks.

Disking
Development of permanent bare soil fuel breaks in PPH or PGH would not occur. If the maximum width of 100 feet of big sagebrush/mix outside of PPH and PGH was disked it would total approximately 1,333 acres. While 1,333 acres represents the maximum area of big sagebrush/mix habitat that could be impacted by disking, the actual number of permanent bare soil fuel breaks would likely be much fewer due to restrictions for other resources.

While bare soil fuel breaks would remove cover, they would only be a small fraction of the 293,787 acre project area and would likely not be used by sage-grouse. There would be no measurable effects to sage-grouse from the small area that could be impacted by this type of fuel break. See Section 3.4.2.2 for further rationale.

Mechanical Thinning and Mowing
Mowing outside of PPH and PGH up to a width of 300 feet would impact approximately 4,000 acres of big sagebrush/mix, which represents approximately 5% of the 80,057 acres of that vegetation type in the project area. Mowing fuel breaks up to 50 feet wide in PPH and up to 100 feet wide in PGH could occur, and sagebrush beyond the mow line could be thinned by hand to approximately 5 – 10% canopy cover for an additional 50 feet in PPH and 100 feet in PGH. Mowing and thinning would impact a maximum of 61 acres of PPH and 386 acres of PGH. A total of approximately 447 acres of big

sagebrush/mix habitat in PPH and PGH could be impacted. Likelihood of impacts to sage-grouse would be negligible based on the rationale provided in Section 3.4.2.2.

Herbicides
All 12,878 acres of fuel breaks with this alternative could potentially be treated with Imazapic and some areas would likely have to be treated more than once. Other herbicides would likely be used for spot treatments of noxious weeds within the fuel breaks. Likelihood of impacts to sage-grouse would be negligible based on the rationale provided in Section 3.4.2.2.

Targeted Grazing and Prescribed Fire
Impacts from these methods would be negligible based on the rationale provided in Section 3.4.2.2.

Seeding/Prostrate Kochia
Vegetated fuel breaks could be up to 100 feet wide in PPH and up to 200 feet wide in PGH. This would impact approximately 61acres of big sagebrush/mix in PPH and 386 acres of big sagebrush/mix in PGH. A maximum of 4,000 acres of big sagebrush/mix could be planted to kochia in proposed fuel breaks outside of PPH and PGH. The likelihood of impacts to sage-grouse would be negligible based on the rationale provided for sage-grouse in Section 3.4.2.2.

All Other Wildlife Species
The effects of the proposed action to the other species analyzed are described in Section 3.4.2.2. Even if fuel breaks were developed at the maximum potential acreage of 12,878 acres, it would still be substantially less than the acres that burned in and near the project area in 2013 alone. The proposed fuel breaks would be developed adjacent to areas where human presence and activity is common and where much of the habitat has already been degraded. Without fuel breaks, wildlife habitat would continue to be lost to the cycle of wildfire and spread of invasive annual grasses and forbs. The continuance of the ongoing scenario would negatively impact wildlife populations for many years.

3.4.2.4 Alternative 3 – North Boundary Adjustment

There are 304 miles of fuel breaks proposed with this alternative. A total of 11,029 acres would be impacted if fuel breaks were established at 300 feet wide for 304 miles; however, as identified in the proposed action (Alternative 2), the actual acres impacted would be substantially less. While there are fewer miles of fuel breaks proposed in this alternative, the potential impacts to wildlife would generally be the same as the Proposed Action.

Greater Sage-grouse
There are approximately 130 acres of PPH and 268 acres of PGH consisting of big sagebrush/mix vegetation in the proposed fuel breaks. Approximately 3,580 acres of big sagebrush/mix are in the proposed fuel breaks outside of PPH and PGH. These acres are calculated based on 300 feet wide fuel breaks.

Disking
Development of permanent bare soil fuel breaks in PPH or PGH would not occur. If the maximum width of 100 feet was disked in the remaining shrub habitat outside of PPH and PGH it would equal approximately 1,193 acres. The maximum acres reported here would likely not be realized due to restrictions for other resources. While bare soil fuel breaks would remove cover, they would only be a small fraction of the 293,787 acre project area and would likely not be used by sage-grouse. There

would be no measurable effects to sage-grouse from the small area that would be impacted by this type of fuel break. See Section 3.4.2.2 for further rationale.

Mechanical Thinning and Mowing

Mowing outside of PPH and PGH up to a width of 300 feet would impact approximately 3,580 acres of big sagebrush/mix, which represents approximately 4% of the 80,057 acres of that vegetation type in the project area. Mowing could occur for up to 50 feet in PPH and up to 100 feet wide in PGH and sagebrush could be thinned by hand to approximately 5 – 10% canopy cover for an additional 100 feet beyond the mow line. Mowing fuel breaks up to 50 feet wide in PPH and up to 100 feet wide in PGH could occur, and sagebrush beyond the mow line could be thinned by hand to approximately 5 – 10% canopy cover for an additional 50 feet in PPH and 100 feet in PGH. Mowing and thinning would impact a maximum of 43 acres of PPH and 179 acres of PGH. A total of approximately 222 acres of big sagebrush/mix habitat in PPH and PGH could be impacted. Likelihood of impacts to sage-grouse would be negligible based on the rationale provided in Section 3.4.2.2.

Herbicides

All 11,029 acres of fuel breaks with this alternative could potentially be treated with Imazapic and some areas would be treated more than once. Other herbicides would likely be used for spot treatments of noxious weeds within the fuel breaks. Likelihood of impacts to sage-grouse would be negligible based on the rationale provided in Section 3.4.2.2.

Targeted Grazing and Prescribed Fire

Impacts from these methods would be negligible based on the rationale provided in Section 3.4.2.2.

Seeding/ Prostrate Kochia

Seeded fuel breaks could be up to 100 feet wide in PPH and up to 200 feet wide in PGH. This would impact approximately 43 acres of PPH and 179 acres of PGH. A maximum of 3,580 acres of big sagebrush/mix could be seeded in proposed fuel breaks outside of PPH and PGH. The likelihood of impacts to sage-grouse would be negligible based on the rationale provided for sage-grouse in Section 3.4.2.2.

3.4.2.5 Alternative 4 – Human Ignition Areas Only

Approximately 92 miles of fuel breaks would be established. These fuel breaks would be located along features with the most fire ignitions including I-84, Hwy 20, and the railroad south of I-84. This alternative has the least risks of directly impacting wildlife and wildlife habitat of all the action alternatives, but it also provides the least benefit to wildlife. The opportunity to improve and protect habitat for wildlife across the project area and surrounding landscape would be minimized. No PPH or PGH would be altered from fuel break development. There are approximately 119 acres of big sagebrush/mix that could be impacted.

3.4.3 Cumulative Effects

3.4.3.1 Scope of Analysis

The scope of cumulative effects varies by species. The temporal scope of analysis for the action alternatives would be three years following treatment, which would allow time for seeded fuel breaks to develop.

3.4.3.2 Current Condition and Past, Present, and Future Actions

Past, present, and future actions that have occurred in the analysis area are listed in Section 3.0. Sage-grouse is the wildlife species of greatest concern in the project area and can be used as an umbrella species. This means that if management actions benefit sage-grouse, it is generally beneficial to sage-brush obligates and species closely associated with sagebrush habitat. Rowland et al. (2006) state that using sage-grouse as an umbrella species would offer relatively high conservation for sagebrush obligate species such as pygmy rabbit. Hanser and Knick (2011) state that the overlap of habitat use by sage-grouse and sagebrush obligate passerines (e.g., Brewer's sparrow) support the concept of using sage-grouse as an umbrella species. Sage-grouse and Brewer's sparrow are the two sagebrush obligate species analyzed in this EA but the other species analyzed, with the exception of longnose snake and western toad, are species closely associated with sagebrush. Cumulative impacts for species associated with sagebrush habitats in this EA are similar to the effects to sage-grouse.

3.4.3.3 Alternative 1 – No Action

Prevention and management of wildfire would not be enhanced. Analysis of cumulative effects for this alternative evaluates the impacts of wildfire and how ongoing and future actions would impact recovery of the area following wildfire. The effects of wildfire to each species were previously identified in the environmental consequences section for the No Action alternative and will not be re-stated here.

Greater Sage-grouse and Brewer's Sparrow

The scope for sage-grouse would include the area within the Mountain Home sage-grouse planning area. Because Brewer's sparrow is a sagebrush obligate species, cumulative effects and the scope of analysis is encompassed within the analysis for sage-grouse.

The analysis area for sage-grouse 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 24 miles (Moser et al. 2012). This 24 mile distance was then buffered by extending 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 that 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 burned 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, weather, 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 compliance with the stipulations for trailing would cause few impacts through burned areas, and would not lead to cumulative effects.

Noxious Weed Treatment
Treatments would reduce the spread of noxious weeds that compete with desirable vegetation following fire. Noxious weed treatments would benefit the recovery of burned areas across the analysis area.

Transmission Line Development (Gateway West)
Energy infrastructure and development degrade habitat and are causing adverse effects to sage-grouse populations (Naugle et al. 2011). Sage-grouse are more likely to utilize habitat as the distance from power lines and communication towers increases (Wisdom et al. 2011). If the proposed transmission lines were put on existing towers already in place, cumulative effects would not occur because there would be no change to baseline conditions. However, if new towers are erected, it would further degrade conditions for sage-grouse because sage-grouse generally show avoidance to tall structures. This impact to sage-grouse would be cumulative with the loss of suitable sage-grouse habitat in and near the project area from wildfire.

Wind energy towers are present and continue to be constructed within the scope of analysis. Construction of new towers that reduce sagebrush or are erected adjacent to sage-grouse habitat would be cumulative with impacts from wildfire.

There would be no cumulative effects to Brewer's sparrow from the proposed Gateway West transmission line because there would be a minimal amount of sagebrush impacted if they do erect new towers. Wind towers have been documented to cause mortality to passerine birds (Erickson et al. 2014), including Brewer's sparrow (Johnson and Erickson 2003). Existing and new wind towers and habitat loss from fire are cumulative effects to Brewer's sparrow.

Wildfires
The cumulative effects to wildfire management as a result of this alternative would be as described in the direct effects analysis.

Recreation
There are low levels of recreation occurring in the project area and people are less likely to recreate in a burned area. Therefore, there would not be any cumulative impacts from recreation in the area.

Golden Eagle and Ferruginous Hawk
The scope of analysis for golden eagle for this alternative includes the project area and the area within 21 square miles of the project area. This analysis area was determined based on the biggest average territories documented in southwestern Idaho (Kochert et al. 2002) and this area encompasses the analysis area for ferruginous hawk.

Fuel Break Development
This action would not occur if the No Action alternative is selected.

Livestock Grazing and Trailing
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.

Transmission Line Development (Gateway West)
Route 8 and Route 9 would pass through the designated scope of analysis for raptors. Habitat loss for prey species from the construction of the proposed transmission line would likely be minimal, especially if existing towers are used. There would be risk of collision and electrocution, which would be cumulative to the effects of wildfire leading to the loss of sagebrush habitat.

Noxious Weed Treatment and Recreation
See sage-grouse.

Mule Deer
Deer that overwinter in the project area are a mix of several populations that spend their summers in a variety of mountainous locations, which makes identifying a concise analysis area difficult. To be overly conservative, the scope of analysis for mule deer includes the project area and the mountains to the north within the Boise River watershed. Most of the analysis area is managed by the U.S. Forest Service.

Livestock Grazing and Trailing, Noxious Weed Treatment and Recreation
See Sage-grouse.

Transmission Line Development (Gateway West)
Habitat loss for mule deer from the construction of the proposed transmission line would be negligible and the impacts from a wildfire would not be cumulative to building the transmission line.

Piute Ground Squirrel, Longnose Snake, Western Toad
These species have small home ranges that are covered within the analysis area for sage-grouse.

Livestock Grazing and Trailing, Noxious Weed Treatment and Recreation
See Sage-grouse.

Transmission Line Development (Gateway West)
Construction of transmission lines would cause minimal loss of sagebrush habitat and would not lead to cumulative effects with wildfire.

3.4.3.4 Alternatives 2-4 – Action Alternatives

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
Effects to greater sage-grouse and Brewer's sparrow would be negligible and potential benefits of fuel break development outweighed the risk of negative impacts. No measurable impacts to these species would occur resulting from any of the action alternatives for the following reasons:

- 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 and Brewer's sparrow is low and will likely remain so due to the high level of human disturbance and due to habitat degradation from wildfire and invasive annual grasses 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 215 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, and Western Toad
Effects to these species would be negligible and the potential benefits of reducing wildfire and spread of invasive vegetation outweigh the risk potential of impacts. Therefore, the likelihood of cumulative effects from project implementation with current and foreseeable projects would be minimal.

3.5 Cultural Resources

3.5.1 Affected Environment – Cultural Resources

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. Camas Prairie to the northeast was also an important area providing camas root (*Camassia quamash*) in the summer (Plew 2008). Groups traveled between the Snake River and Camas 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 Camas 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.

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).

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.

Additional cultural resource surveys will be required under Alternative 2 since approximately 33 additional miles of fuel break were added to this alternative after the draft EA was sent out for public review. If Alternative 3 is chosen then additional cultural resource surveys would be required along the power line and power line road, as well as 17 additional miles of fuel break. These surveys will change the number of acres surveyed as well as the number of sites recorded and determined eligible for listing on the NRHP.

3.5.2 Environmental Consequences – Cultural Resources

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 grasses and forbs in the interspaces. Not all tools are appropriate for all sites when considering site type, vegetation, and soil conditions. 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 would impact the site's vertical and horizontal spatial integrity through churning soil up to 9" deep. Disking can destroy features, break artifacts, and either cover or uncover artifacts by soil movement. Post disking there is the potential for soil erosion where silty or loose soils are prevalent. Additionally, linear features would also be heavily impacted by disking through flattening of feature berms, 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, when vegetation has regrown to about 15", throughout the life of the project.

Mechanical treatments may be followed with herbicide treatments to reduce annual plant species 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.

Herbicides

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 Livestock 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 invasive annual plant species. 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. Rangeland drills may be pulled with a rubber-tire tractor or track-driven bulldozer. Disturbance with a rangeland drill can be categorized as either minimal (0-1" disturbance), moderate (1-2" disturbance) or substantial (2-6" disturbance). 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) to 2" (6cm) 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. In no instances will drill seeding exceed a 2" depth and the use of a track-driven bulldozer to pull the rangeland drill will not be allowed in any archeological 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, pulled by rubber-tire tractor, 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.

Cultipacker and Hydromulching

The use of a rubber-tire cultipacker may be an acceptable method for seeding on or near archaeological sites since ground disturbance would be less than using a drill seeder. The main foreseeable disturbance would be from the tractor turning within a site. Therefore if a cultipacker/tractor was used within a site it would not be allowed to turn within that site. A cultipacker may be used within the 100' foot buffer around the Oregon Trail where drill seeding is not acceptable. The cultipacker would be used parallel to the trail and not within the trail corridor. The Idaho SHPO will be consulted prior to using this equipment on any archeological site or within the 100' buffer around the Oregon Trail.

Hydromulching would be an acceptable method of seeding since it is not ground disturbing and the seed could be sprayed from a distance, such as from outside an archaeological site or the Oregon Trail corridor. Tinting of the hydroseed mulch is a short term impact to the visual integrity of the site and

usually lasts no more than a few weeks. The Idaho SHPO will be consulted prior to using hydromulching on any archeological site, within the 100' buffer around the Oregon Trail, or on the Oregon Trail.

Plant Species for Seeding

Six species of plants, three native and three non-native, have been identified for use within the area, however, prostrate kochia is the preferred species for use within the fuel breaks. Although native vegetation is the preferred species, particularly along the Oregon National Historic Trail, the use of any of the species of plant proposed is acceptable provided the seeds are incorporated into the soil using the methods described above or by hand seeding or UTV/ATV mounted applicators.

Prostrate Kochia

The seeding of 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 by annual plants, such as cheatgrass, which has increased the fire return interval. The growth characteristics of prostrate kochia makes it effective in reducing 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.

3.5.2.1 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.

3.5.2.2 Alternative 2 – 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 known 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. Approximately 33 miles of additional fuel breaks were added to this alternative after public review. Those acres of fuel break, which amount to 1,925 acres will be surveyed for cultural resources prior to fuel break implementation. As such, the number of miles of Oregon National Historic Trail and the number of acres of other significant sites requiring mitigation may change.

Within the 2,256 acres (subject to change with additional cultural resource surveys), fuel break construction tools will be limited based on site type and location. In all cases no heavy ground disturbing activities such as disking, drill seeding below a 2" depth or the use of a bulldozer 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 on a site by site basis in consultation with the Idaho SHPO.

3.5.2.3 Alternative 3 – North Boundary Adjustment

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/powerline road will be conducted if this alternative is chosen. Additional cultural resource surveys would be required along approximately 17 miles of additional fuel breaks that were added after public review. These additional surveys in which previously unknown sites are recorded may increase the number of acres requiring either mitigation or avoidance. Based on cultural resource surveys to date 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 identical to those mentioned under Alternative 2.

3.5.2.4 Alternative 4 – High Human Ignition Areas Only

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 identical to those mentioned under Alternative 2.

Table 3.12 - Number of Acres of Site & Oregon Trail Requiring Mitigation By Alternative

Alternative	Acres Requiring Mitigation	Oregon Trail Miles
2 – Proposed Action	2256+	12.3+
3 – North Boundary Adjustment	645+	2.75+
4 – High Human Ignition Areas	72	0

+ Denotes additional cultural resource surveys may change these acres and miles.

3.5.3 Cumulative Effects – Cultural Resources

3.5.3.1 Scope of Analysis

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.

3.5.3.2 Current Condition and Past, Present, and Future Actions

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.

Transmission Line Development (Gateway West)

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 power lines 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. If either of these two routes is chosen as the preferred route any impacts to the Oregon Trail or any other archaeological site will be addressed per the Historic Properties Treatment Plan that is being prepared.

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.

Residential Development (Mayfield)

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.

3.5.3.3 Alternative 2 – Proposed Action

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 from impacts associated with the above listed proposed projects. The 2000 acres calculated within the APE is strictly for acres that contain the OR Trail and its associated half-mile buffer.

3.5.3.4 Alternative 3 – North Boundary Adjustment

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 from impacts associated with the above listed proposed projects. The 445 acres calculated within the APE is strictly for acres that contain the OR Trail and its associated half-mile buffer.

3.5.3.5 Alternative 4 – High Human Ignition Areas Only

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.

3.6 Visual Resources

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.

3.6.1 Affected Environment – Visual Resources

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 16). The management objectives for each VRM Class are listed below.

- **Class I 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.
- **Class III Objective** – 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** – 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 based on 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.

3.6.2 Environmental Consequences – Visual Resources

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. Two Key Observation Points (KOPs) were used to conduct the analysis; one located along the Hammett Hill Road (just south of Old Oregon Trail Road) and one located along 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 analyzed for all treatment lands (BLM, BOR, and State) but not on private lands.

3.6.2.1 Alternative 1 – No Action

There would be no development of fuel breaks within the project area. There would be an increase in 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. This would be most evident to the casual observer in VRM I areas with existing stands of sagebrush.

3.6.2.2 Alternative 2 – Proposed Action

The proposed action would create fuel breaks along 275 miles within VRM Class III and IV areas and 81 miles within Class I areas. Of the 81 miles of Class I areas about 16 miles contain intact stands of sagebrush.

Due to the low rolling to flat nature of much of the project area, constructing 356 miles of fuel breaks along existing roads and power lines would cause 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.

Due to the large amount of area previously disturbed from other uses, 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 moderate amount of contrast due to introduction of the distinct lines in the landscape between vegetation types. The lighter color of new vegetation following construction of the project would create moderate to weak contrast with the existing vegetation (see visual simulation in Figure 2).

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 Figures 3 & 4.

Figure 2 - Visual Simulation of prostrate kochia fuel break

Figure 3 - Existing view from Bennett Mountain Road

Figure 4 - Visual Simulation of hand thinning sagebrush 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 (275 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 81 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 along section of proposed treatment areas. 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 in the most sensitive areas, the proposed action would not draw attention for a majority of casual observers and would meet management objectives.

3.6.2.3 Alternative 3 – North Boundary Adjustment

The visual impacts associated with construction of 305 miles of fuel breaks as proposed in Alternative 3 would be the same as Alternative 2 but on slightly fewer miles (about 50 miles less). The 275 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 37 miles of fuel breaks in VRM Class I areas is less than 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 not draw attention to a majority of casual observers and would meet the visual objectives for the areas.

3.6.2.4 Alternative 4 – High Human Ignition Areas Only

Alternative 4 proposes fuel breaks along 92 miles of linear features in the project area. The impacts to the visual environment would be the same as described in Alternative 2 but would only affect a third as many miles. While there are fewer overall miles compared to the other alternatives, the treatment miles occur, almost entirely, in VRM III areas (98 percent). The impacts in Class I areas would only affect 1 mile along Interstate 84 and would not affect the visual character of the area. All visual objectives would be met for this alternative.

3.6.3 Cumulative Effects – Visual Resources

3.6.3.1 Scope of 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.

3.6.3.2 Current Condition and Past, Present, and Future 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 (since 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.

3.6.3.3 Alternative 1 – No Action

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.

3.6.3.4 Alternatives 2-4 – All Action Alternatives

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 4 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.

3.7 Soils

3.7.1 Affected Environment – Soils

Soil information is derived from the Soil Survey of Elmore County Area, Idaho, including parts of Elmore and Ada Counties (USDA NRCS 2014). 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.

3.7.2 Environmental Consequences – Soils

3.7.2.1 Alternative 1 – No Action

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

Fire consumes the vegetative cover, exposing soils to thermal extremes and reducing the ability of the soil to withstand the erosional forces of wind and water. Increased fire frequency results in long term changes of the plant community structure and composition. This conversion is to an herbaceous plant

community, which is most often comprised of invasive annual grasses and forbs that do not provide adequate soil protection or extensive root systems.

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.

3.7.2.2 Alternative 2 – Proposed Action

Approximately 1,375 acres of proposed fuel breaks 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 fuel break 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 fuel break 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 Thinning 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.

Herbicides

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 fuel break 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 Livestock Grazing

Direct short-term effects to the soil resource from hoof action during targeted grazing would include removal of vegetation cover and disturbance of the soil surface horizon (including biological soil crusts where they exist) and a subsequent increase in temperature, dryness, and wind erosion potential (and water erosion potential on steeper terrain). The depth of this disturbance in the soil profile is much less than either disking or drill seeding (less than 1 inch on dry soils and approximately 1-2 inches on wet soils) making the potential for soil loss through erosion considerably less compared to either of these two methods.

Over the long-term, targeted grazing without additional treatment methods would have to occur on a yearly basis over the same area to be an effective fuel break making the soil surface horizon vulnerable to erosional processes for as long as the fuel break is maintained. 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 fuel break 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 fuel break 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 fuel break 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.

3.7.2.3 Alternative 3 – North Boundary Adjustment

For alternative 3 on BLM/BOR/State managed lands, approximately 1,170 acres of proposed fuel break 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).

3.7.2.4 Alternative 4 – High Human Ignition Areas Only

For alternative 6 on BLM/BOR/State managed lands, approximately 685 acres of proposed fuel break 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).

3.7.3 Cumulative Effects – Soils

3.7.3.1 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 fuel breaks 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.

3.7.3.2 Current Condition and Past, Present, and Future 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.

Livestock Grazing

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.

Roads and Rights-of-Way
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.

Fire Rehabilitation (Seeding)
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
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.

Recreational OHV Use
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.

Wildfire
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 soils from bulldozed fire lines include 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.

Transmission Line Development (Gateway West)
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.

Agriculture

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.

3.7.3.3 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.

3.7.3.4 Alternative 2-4 – All 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.

3.8 Air Quality

3.8.1 Affected Environment – Air Quality

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.

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.

3.8.2 Environmental Consequences

3.8.2.1 Alternative 1 – No Action

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

3.8.2.2 Alternative 2-4 – All Action Alternatives

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 IDEQ'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.

3.8.3 Cumulative Effects – Air Quality

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

3.9 Livestock Grazing Management

3.9.1 Affected Environment – Livestock Grazing Management

Within the project area, the BLM manages 39 grazing allotments with active permits (Table 3.13, Map 17). As described earlier, much of the native perennial rangeland in the project area has burned (often multiple times) and subsequently converted to annual vegetation. The resultant consequences to livestock grazing management is an unpredictable forage base that varies from year to year, based on annual spring precipitation. Available forage in grazing allotments is allocated based on expected pounds per acre of herbaceous biomass for a given area. The amount an average cow and calf consume in a typical one month period is estimated to be 800 pounds. When a wildfire burns vegetation in a public land grazing allotment, the management agency must determine whether or not to re-seed burned areas and restrict livestock use while new seedings establish, or native rangeland recovers. Areas that recover naturally often do not produce the same amount of forage for a few years, and areas that are re-seeded need to be allowed to become established before livestock are re-introduced. These requirements result in portions, or entire allotments being closed to livestock use after a wildfire so

vegetation can become re-established. Although wildfire is an inevitable natural event, knowing where, when, and how big a fire will be are not predictable. The fire return interval in southwest Idaho was historically 50-150 years based on historical records and vegetation mapping. With the invasion of annual grasses, the return interval has decreased to close to 5-10 years. This altered fire return cycle means that livestock operators on public land allotments must change and adapt their business operation to rest areas after wildfire.

Table 3.13 - BLM Administered Grazing Allotments Acres in Project Area

Allotment Name	Acres in Project Area	BLM/State Acres in Alt 2 Footprint	BLM/State Acres in Alt 3 Footprint	BLM/State Acres in Alt 4 Footprint
2+ Custodial	2,270.3	32.6	32.8	0.0
Blacks Creek FFR[1]	1,567.6	24.3	98.4	0.0
Bonneville Point	152.9	34.7	9.5	0.0
Bowns Creek	676.3	51.3	51.3	51.3
Bryon's Run FFR[1]	1,434.5	4.6	4.6	4.2
Chalk Flat	13,833.6	695.9	695.9	601.0
Cornell	10,457.7	109.3	38.6	8.9
Ditto Creek	26,362.4	617.3	480.6	137.6
Double Anchor FFR[1]	2,595.6	22.0	22.0	0.0
East Slater Flat	6,839.1	133.2	133.2	133.2
Emigrant Crossing	2,289.5	168.6	169.5	0.0
Greek Field FFR[1]	1,270.0	0.0	0.0	0.0
Hammett #1	1,119.5	171.7	111.9	0.0
Hammett #2	1,785.9	113.5	113.5	0.0
Hammett #4	3,907.3	426.4	155.9	0.0
Hammett #4 - State	86.8	64.7	0.0	0.0
Hammett Individual	1,789.1	155.0	155.0	34.5
Hot Springs	778.8	297.9	0.0	0.0
Indian Creek FFR[1]	5,793.5	120.3	120.3	90.3
Little Canyon	2,321.4	0.0	0.0	0.0
Lockman Butte	5,694.8	179.6	179.6	179.6
Lower Alkali	2,203.7	55.1	55.1	0.0
Lower Bennett Creek	22.5	0.0	0.0	0.0
Martha Avenue	8,854.7	528.8	482.4	127.2
Morrow Field	575.3	0.0	0.0	0.0
Mountain Home Subunit	65,263.6	4,933.1	4,636.1	738.6
Mud Springs	6,597.4	114.5	22.1	0.0
North Cold Springs	1,146.9	221.5	102.8	0.0
Plateau	2,540.8	60.2	60.2	48.9
Sheep Creek	4,207.8	0.0	99.4	0.0
South Cold Springs	9,094.9	568.1	455.5	0.0
Southeast Alkali Seeding	895.8	58.7	58.7	0.0
Southwest Alkali Seeding	1,135.2	153.0	153.0	0.0
Stewart FFR[1]	1,212.7	7.4	0.0	0.0
Sugarbowl	869.6	233.6	233.6	0.0
Sunnyside Spring/Fall	20,728.3	298.8	298.8	266.6
West Slater Flat	5,152.8	587.6	587.6	188.2
Totals				

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

3.9.2 Environmental Consequences – Livestock Grazing Management

3.9.2.1 Alternative 1 – No Action

Without implementation of the proposed project, the current trend of increased wildfire frequency and size would be expected to continue. Current BLM policy directs that stabilization and rehabilitation treatments following wildland fires are prioritized by risk to; life, property, and resources. Of the resources, habitat for threatened and endangered species is a top priority, however in arid and semi-arid rangelands such as the project area, timely and adequate precipitation often does not occur, and rehabilitation treatments are spotty at best. Treatments following fire that involve seeding or planting require protection from livestock use for plants to become established. Depending on climatic conditions adequate establishment can take between two and five years. Large continuous burned areas within pastures and allotments result in significant impacts to livestock operations, to relocate or find other means of forage while the pastures or allotments are being rested from livestock. Within the project area, areas dominated by cheatgrass have been documented to burn in consecutive years, resulting in long term exclusion of permitted livestock grazing on federal lands.

3.9.2.2 Alternative 2 – Proposed Action

Implementing the proposed project would require some means of restricting livestock use along the linear fuel breaks where they cross pastures and allotments. In large pastures or allotment, this could be accomplished by limiting water sources adjacent to the seeded areas, to keep livestock off seedings while they establish. Other options that could be employed would be active herding to keep livestock away from newly seeded areas, temporary electric fencing, altering rest rotation schedules, or deferring use to late fall/winter. In extreme cases when a substantial portion of a pasture is involved, temporarily closing the entire pasture may be required. The options available to livestock permittees vary by the terms and conditions that are specific to the individual grazing permit.

If the proposed action is implemented, livestock permittees would be impacted at varying levels, depending on the amount of BLM and state lands on the allotments (Table 3.13). Allotments that are mostly comprised of BLM public land would potentially be more impacted from the project than allotments with majority of land ownership being private. The impact to the livestock permittees under this alternative would mostly occur during the implementation and establishment phases (1-5 years), with benefits being realized in the long-term (5-30 years) with smaller, less frequent fires and an increased potential for successful vegetation treatments to restore native sagebrush steppe habitat.

Areas seeded with prostrate kochia would benefit from light to moderate grazing levels to remove annual seed stalks and maintain plant height. This would be an indirect benefit to livestock grazing management by providing a high protein perennial source of forage.

3.9.2.3 Alternatives 3 & 4 – All Action Alternatives

Implementation of either of these alternatives would have overall considerably less impact to livestock operators in the short-term (1-5 years) since less land would need to be rested from livestock use during establishment of seedings. However, indirect impacts resulting from more acres being burned and needing to be rested for recovery and reseeding could be equal to or outweigh the short term impacts. Although these alternatives would provide some protection in areas with potential for high ignitions, and provide some compartmentalization for reducing wildfire sizes than the no action alternative, they would not provide as much protection or wildfire reduction potential as Alternative 2. These factors would affect the level of impacts to livestock permittees described in Alternative 2.

Areas seeded with prostrate kochia would benefit from light to moderate grazing levels to remove annual seed stalks and maintain plant height. This would be an indirect benefit to livestock grazing management by providing a high protein perennial source of forage.

3.9.3 Cumulative Effects – Livestock Grazing Management

Between the various action alternatives, approximately 3,400 to 12,878 acres within the project area would be developed into fuel breaks. The scope of analysis for cumulative effects on livestock grazing 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.

3.9.3.1 Alternative 1 – No Action

Failure to take action would result in an increase in occurrence and fire size, thereby increasing acres excluded from livestock use to allow for recovery form fires. Area converted from perennial plant communities to plant communities dominated by invasive annual grasses and forbs would reduce the predictability of available forage for livestock, further complicating grazing permittee options. Recurring wildfires would likely result in post-fire rehabilitation treatments, requiring extended rest while seeded plants become adequately established to withstand grazing impacts.

3.9.3.2 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 protected from recurring fires would result in an increase in perennial plant communities, and more predictable and greater diversity of forage. Expected residential development on private land would not have an effect to livestock grazing permits on federal land.

3.9.3.3 Alternatives 3 &4 – 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. Focusing on areas with high incidence of human caused ignitions (Alternative 4) would provide a critical buffer in an important zone of ignitions; however the remaining portions of the project area at risk would not be compartmentalized and would be at risk of large wildfires that occur during storms with multiple lightning strikes.

4.0 Consultation and Coordination

4.1 Interdisciplinary Team Members

Name	Title
Amy Stillman	Great Basin Institute – Botanist (Contractor)
Chris Clay	BLM - BDO GIS Coordinator
Karen Kumiega	BLM - BDO Cultural Resource Specialist
Kathi Kershaw	BLM - BDO Resource Coordinator
Larry Ridenhour	BLM - FRFO Outdoor Recreation Planner
Mike McGee	BLM - BDO Wildlife Biologist (Team Lead)
Seth Flanigan	BLM - BDO NEPA Specialist
Trisha Cracroft	NRCS - State Biologist

4.2 Cooperating Agencies

4.2.1 NRCS Cooperating Agency Agreement

In preparation of this environmental assessment, the Boise District BLM and Idaho NRCS entered into a cooperating agency agreement. This agreement would facilitate the development of fuel breaks on private lands to complete proposed treatments spanning differing land ownership. For private lands, the NRCS would complete a site-specific analysis known as an Environmental Evaluation per the agency's NEPA implementation regulations. The NRCS would implement project actions on private lands according to their authorities and management policies, and through their funding mechanisms.

The NRCS may also provide funding for implementation on BLM managed lands through contracts with permittees in concurrence with the BLM Field Manager. Actions on private land supported by the NRCS would include botanical and cultural surveys and analyses, and compliance with NEPA and other environmental laws. The surveys and analyses completed as part of the Environmental Evaluation would be conducted after approval of funding applications. If all land owners participated in fuel break development in conjunction with the proposed action, an estimated 213 miles of fuel breaks would be developed on private land.

4.2.1.1 NRCS and NEPA

NRCS follows a nine step conservation planning process to develop conservation plans with private landowners who are interested in technical or financial assistance. The conservation plans address identified resource concerns by planning conservation practices. NRCS complies with NEPA by developing programmatic Environmental Assessments (EA) or Environmental Impact Statements (EIS) then conducting site specific environmental evaluations (EE)'s as part of the planning process. The EEs are a concurrent part of the planning process in which the potential long- and short-term impacts of an action are analyzed and alternative actions explored. The EEs and conservation plans assist the landowner in making decisions and implementing the conservation practices identified in the conservation plan. The responsible federal official (RFO) determines if the proposed action has been sufficiently analyzed under an existing NEPA document before signing the completed EE. The attached flow chart may be helpful.

4.2.1.2 NRCS and Paradigm

The Paradigm Project is being analyzed under the DOI-BLM-ID-B010-2011-0060 Paradigm Fuel Break EA with BLM as the lead agency. As a cooperating agency on this document, NRCS will independently review the EA and if appropriate, publish a FONSI. The Paradigm Fuel Break EA will specify where private land surveys for cultural resources and T&E species will deviate from those on public land. NRCS will develop site specific conservation plans identifying resource concerns, special circumstances, or any other nuance that may occur on that piece of property and incorporate the analysis into the EE. NRCS will use the Paradigm EA as the programmatic EA for the entire project. The NRCS RFO will use site specific EEs to determine whether the action has been sufficiently analyzed in the Paradigm EA document. If not, the project will either not be funded by NRCS or a site specific EA or EIS will be developed.

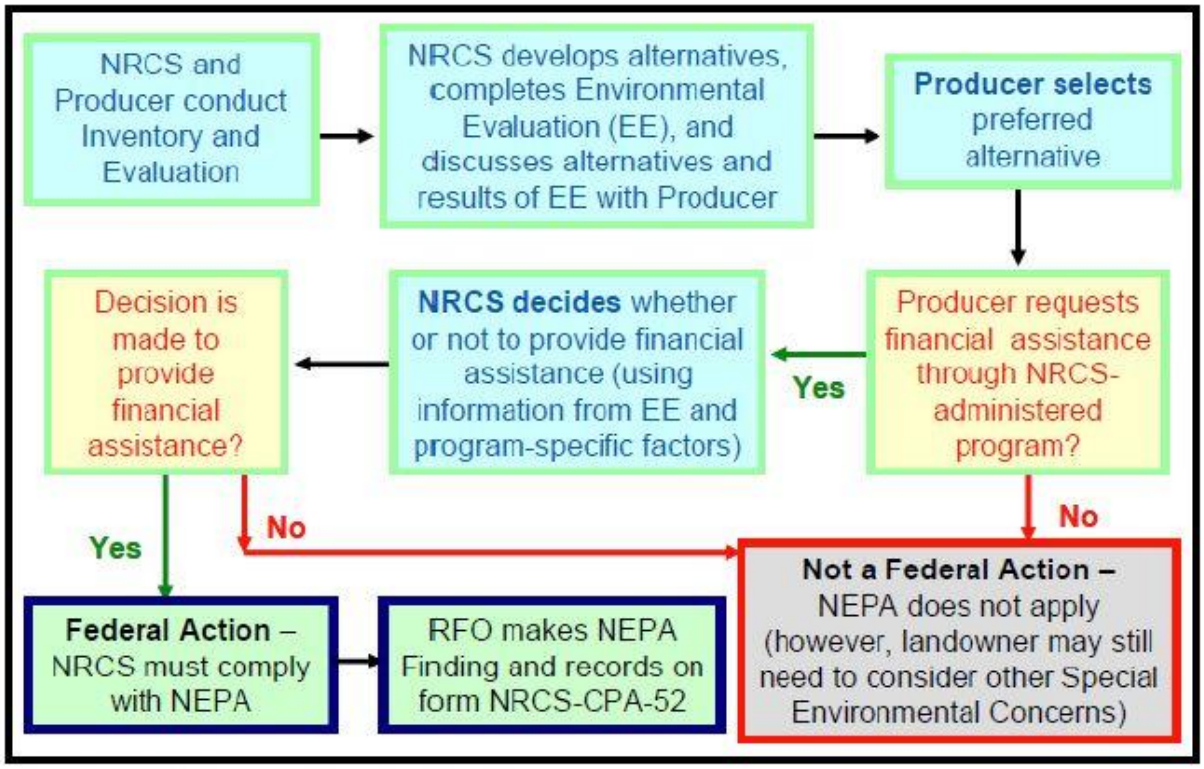

Figure 2 – NEPA and the NRCS Process

4.3 Agencies, Organizations, Tribes, and Individuals Consulted

4.3.1 Tribal Consultation

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

authorities include: the American Indian Religious Freedom Act of 1979 (AIRFA); the National Environmental Policy Act of 1969 (NEPA); the Federal Land Policy and Management Act of 1976 (FLPMA); and Executive Order 13007-Indian Sacred Sites. The proposed action is in compliance with the aforementioned authorities.

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

Other tribes that have ties to southwest Idaho include the Bannock Tribe and the Nez Perce Tribe. Southeast Idaho is the homeland of the Northern Shoshone Tribe and the Bannock Tribe. In 1867 a reservation was established at Fort Hall in southeastern Idaho. The Fort Bridger Treaty of 1868 applies to 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.

Consultation and Coordination with the Shoshone-Paiute Tribes occurred over various meetings held at the Boise District Office. Such did not result in any specific alternatives developed or mitigation measures regarding the proposed action or alternatives.

4.3.2 US Fish and Wildlife Service

Consultation regarding the potential effects to Slickspot Peppergrass was completed according to the requirements of Section 7 of the Endangered Species Act. A Biological Assessment (BA) was submitted by BLM to USFWS on January 9, 2014, and an addendum to the BA was submitted to USFWS on January 26, 2014. A Conference Opinion, in which conservation recommendations were provided, was received from USFWS Snake River Basin Office on April 20, 2015. Additionally, A BA was submitted by NRCS to USFWS on March 10, 2015 to consult on privately-managed lands. The BLM BA and NRCS BA were combined to create one conference opinion. These recommendations were provided to the authorized officer for review in completing his decision.

4.3.3 Idaho State Historic Preservation Office

A field trip was held with personnel from the Idaho State Historic Preservation Office (SHPO) in May 2013 to discuss the potential effects to the Oregon National Historic Trail and recommendations for mitigating such. These recommendations were incorporated in the design features for the preservation of the Trail as described in Section 2.3.2.

4.3.4 Other State and Local Agencies Consulted

Boise District Resource Advisory Council
Idaho Department of Lands
Idaho Department of Fish and Game

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6.0 Appendices

6.1 Appendix: Herbicide Treatment Standard Operating Procedures

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, un-infested material in a weed-free condition.

BLM Activity	Prevention Measure
Revegetation (Cont'd)	• 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

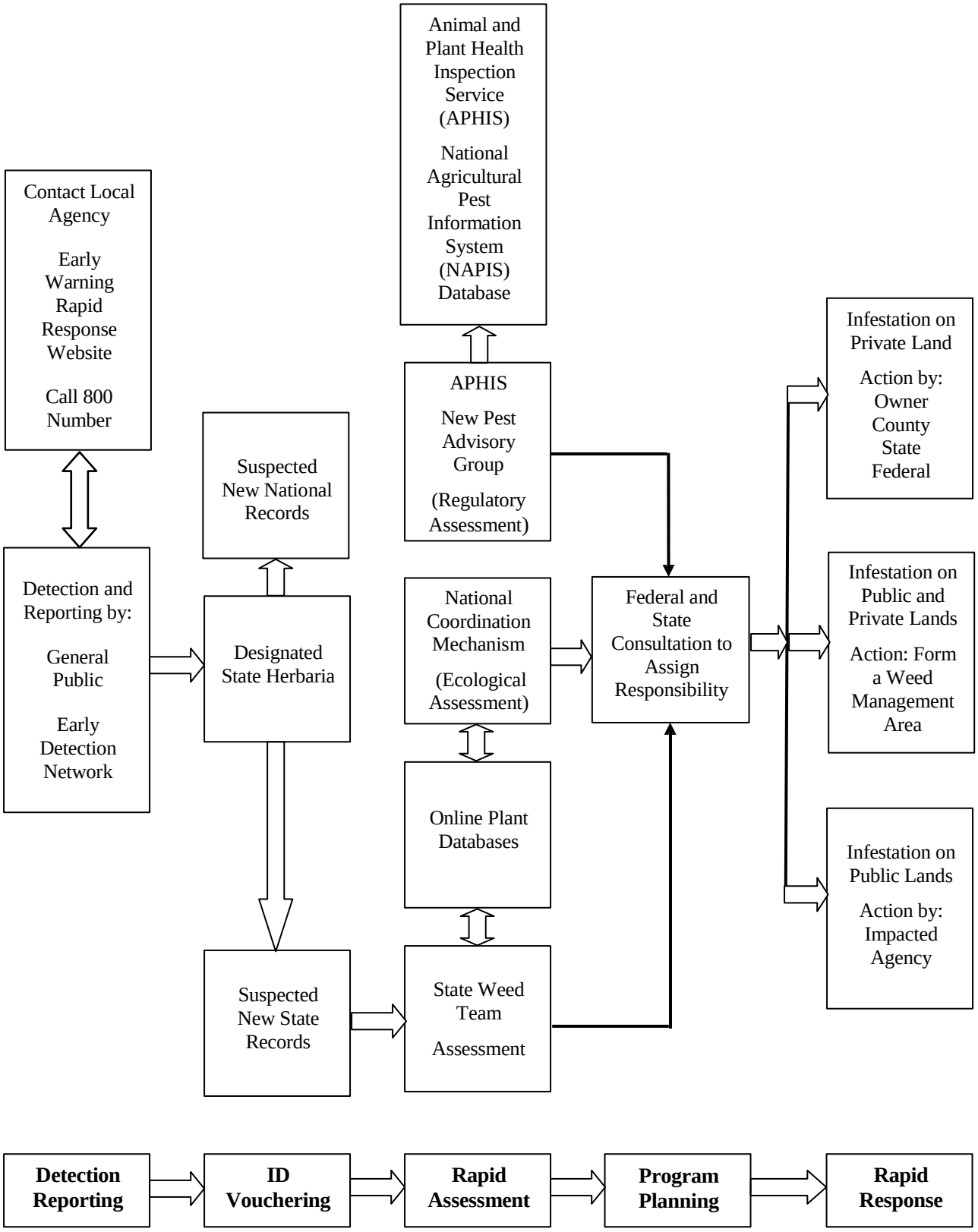


Figure B-1. National Early Warning and Rapid Response System for Invasive Plants.

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.

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.

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 and 6780 (Habitat Management Plans) 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.
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.

Resource Element	Standard Operating Procedure
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 CFR 800, including necessary consultations with State Historic Preservation Officers and interested tribes. • Follow BLM Handbook H-8270-1 (General Procedural Guidance for Paleontologica Resource Management) to determine known Condition I and Condition 2 paleontological areas, l 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*	• 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).
Resource Management)	• 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.
Wilderness and Other Special Areas See handbooks H-8550-1 (*Management of Wilderness Study Areas (WSAs)*), and H-8560-1 (*Management of*	• 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.

Resource Element	Standard Operating Procedure
Designated Wilderness Study Areas), and Manual 8351 (*Wild and Scenic Rivers*)	• 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.
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.

Resource Element	Standard Operating Procedure
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.

6.2 Appendix: Monitoring Methodology

Monitoring Plot Design

Permanent monitoring sites would be established where conditions are representative of the various prescribed treatments in the project area. Locations would be marked with a witness post placed on the edge of treatment area to aid in relocation, and recorded using a GPS receiver. The transect start points would be located a minimum of five-meters from the witness post to reduce potential impacts to transects from post placement. Two transects would be established at the monitoring location, one inside the treatment and one outside. Within the treatments, a 100-meter transect would run into the treated area. Data collected along this transect would document species diversity, invasive species density, and shrub data. Immediately outside the treatments, a meandering transect would run parallel to the treatment. Data from this transect would document impacts to the untreated areas from the treatment, specifically movement of prostrate kochia from seedings. Additionally, a GPS receiver would record the UTMs at the start and end points of each transect so transects can be relocated for monitoring in subsequent years.

At each location, a series of photographs would visually record condition of transects. Data collected would vary by treatment type, but would include line and point intercept and density of all plant species present. Data collection would follow protocols found in the Monitoring Manual for Grasslands, Shrubland, and Savanna Ecosystems (Herrick et al. 2009).

Plot Description

Record general information related to the macro plot (i.e., plot identifier, date, UTM, elevation, aspect, slope, etc.)

Photo Points

A landscape view photograph would be taken at both the start point looking toward the end point and a photo of the first plot (5 meter mark). A photo-card would be included in each photograph with the following information:

- project name
- date

- plot identifier
- start-point UTM
- direction or bearing of transect

Point Intercept
Cover, height, and species composition would be collected as point intercept data at 2 meter intervals along the 100 meter transect, for a total of 50 points.

Density
Density of all species would be recorded using a quarter of a meter nested plot frame at 20 meter intervals along the 100 meter transect, for a total of 5 plots. Density data would be used to determine species density and composition.

Line Intercept
Canopy cover of plant species and plant height would be measured and recorded along the length of each transect.

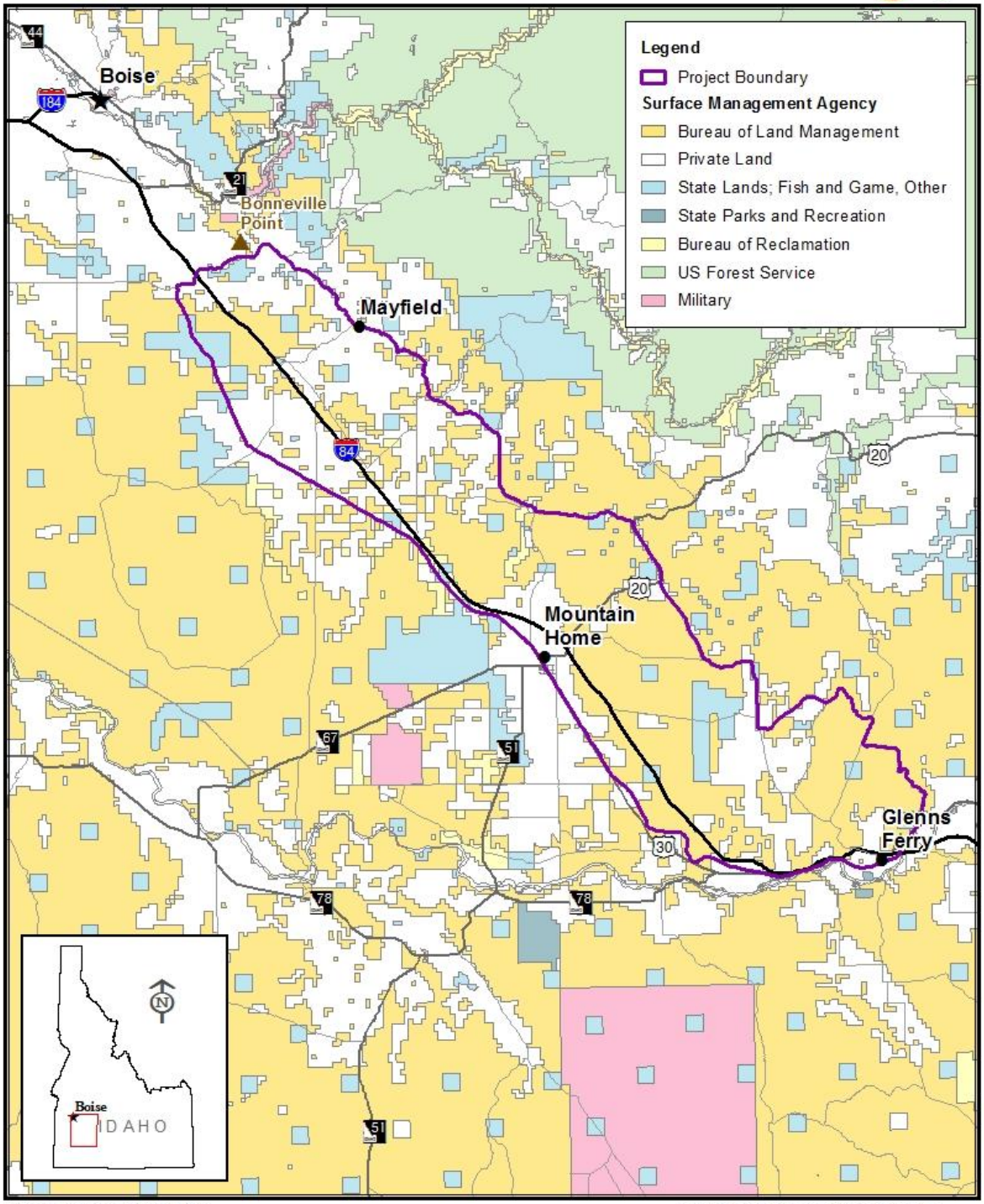
Meandering Transect with Shrub Hoop Plots
This transect covers a large area and is designed to detect rare occurrences of plant species, such as satellite populations of introduced species. This transect will provide quantitative data to detect establishment of prostrate kochia from the seeded area into adjacent unseeded lands. Beginning from a witness post and running parallel to the treatment area, 50 - 1/100 acre plots record target species along a designated azimuth. Transects generally cover 500 to 1,000 feet in length.

Suppression Effectiveness
Effectiveness of the fuel breaks as a wildland fire suppression tactic would be determined with established practices outlined in the Fuels Treatment Effectiveness Module (FTEM). Data collected using the FTEM allows analysis of the effect of fuel treatments on wildfire behavior. The analysis would also help managers understand how moderating fire behavior influences the ability to safely contain wildfires, and how it reduces impacts to resources. An FTEM assessment would be performed for any wildfire that intersects a treatment area, which would provide crucial information to help fire managers improve fuel breaks to make them more effective in the future.

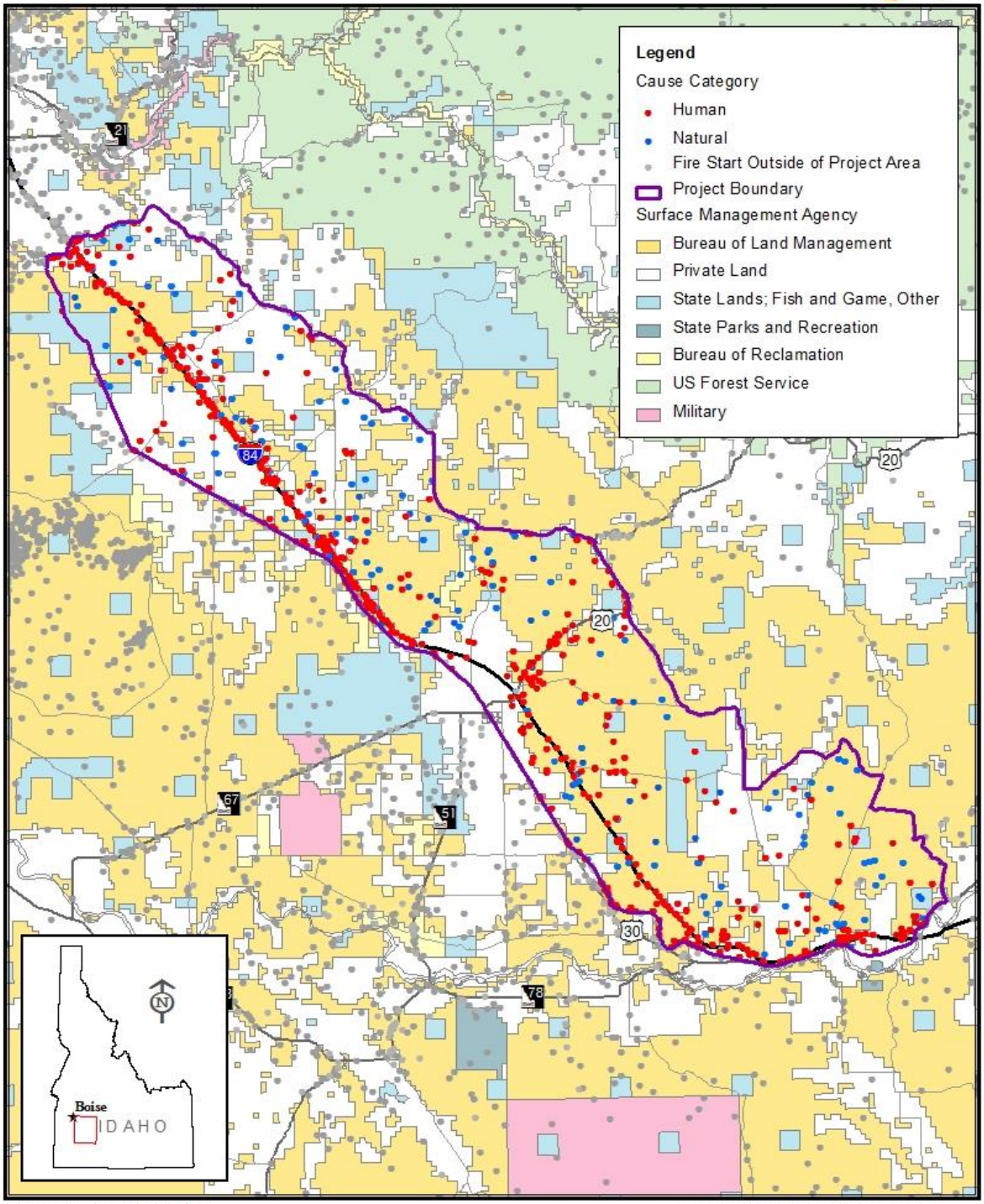
When observations show reduction of fire behavior between fuel breaks and adjacent untreated vegetation, a fuel break could be considered effective. Effectiveness would also be determined if the fuels break was used as tool in the active suppression of a wildfire by resources on scene. This would be determined through interviews with individuals that respond to the incident and with other available empirical data. All observations made would be catalogued and recorded in the FTEM database.
Additional documentation to evaluate fuel break effectiveness during fire suppression would include interviews with fire personnel and post-fire site evaluation.

7.0 Maps

1. Vicinity Map



2. Fire Ignition History (1957 - 2013)



The sources of the data are from Idaho-BLM Corporate Data.
2/23/2015

0 4 8 16 Miles

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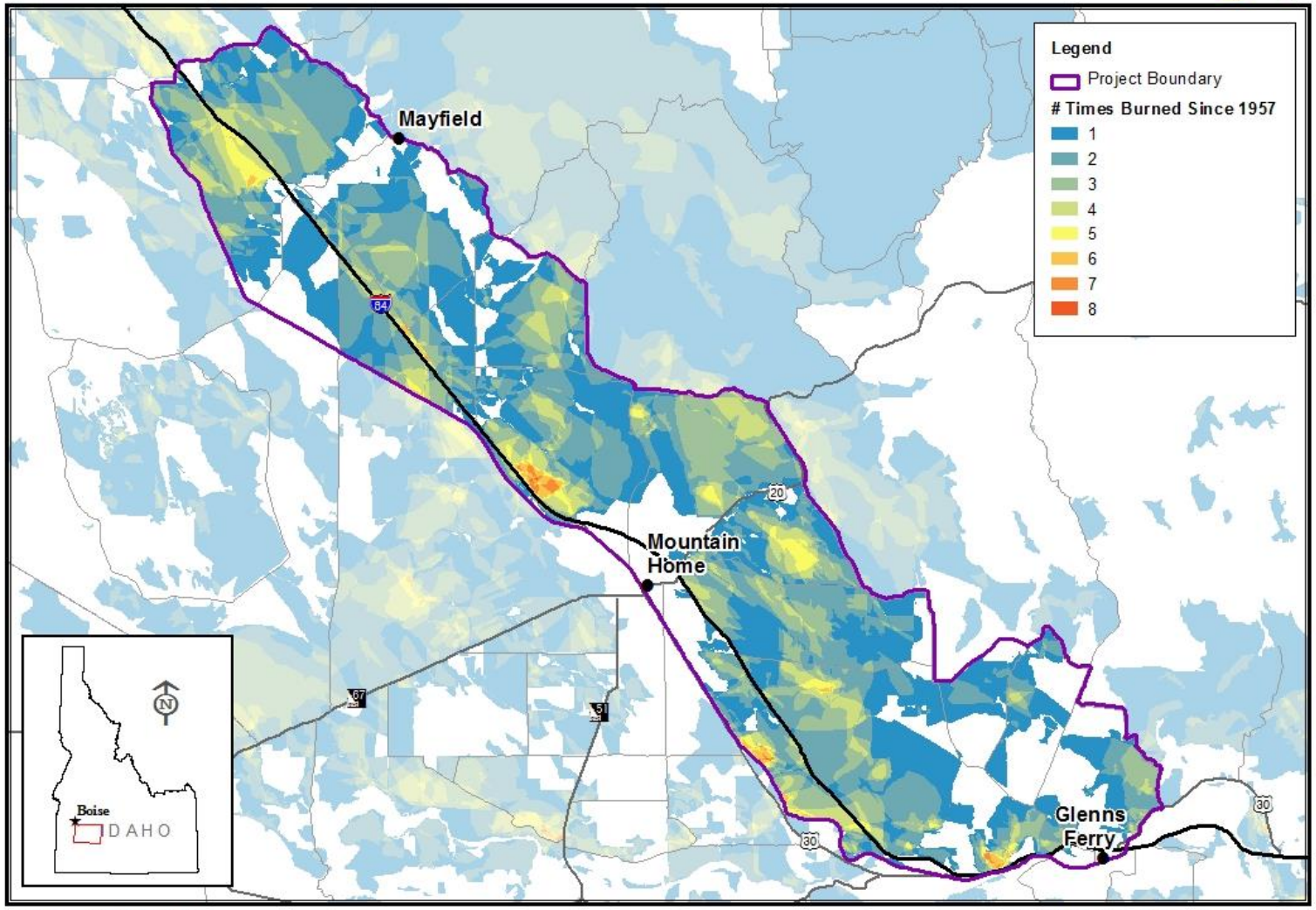
3. Fire History 1957 - 2013



The sources of the data are from Idaho-BLM Corporate Data.
2/23/2015

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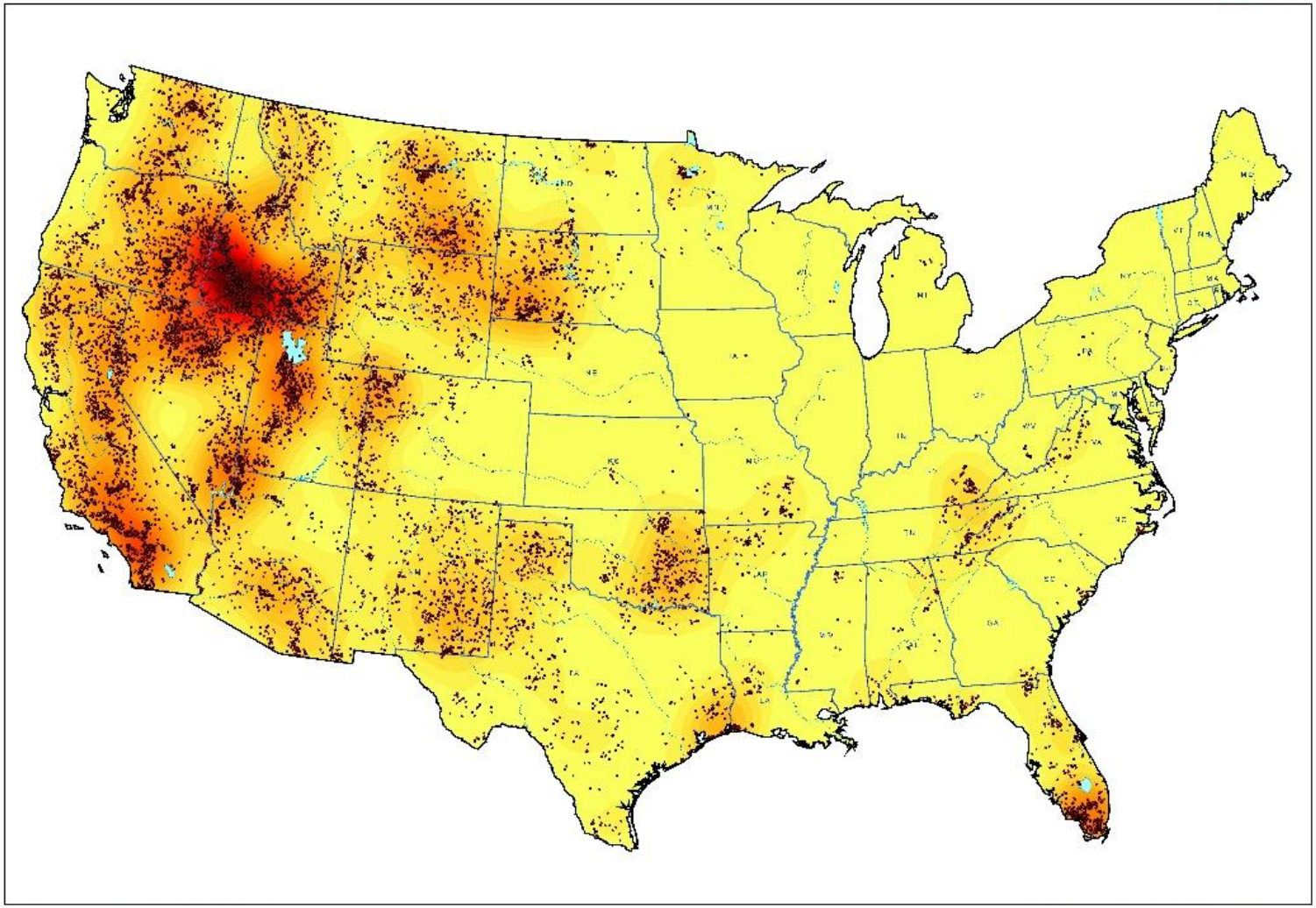
4. National Fire Locations > 300 Acres (1970 - 2007)



The sources of the data are from the National Interagency Fire Center.
2/23/2015

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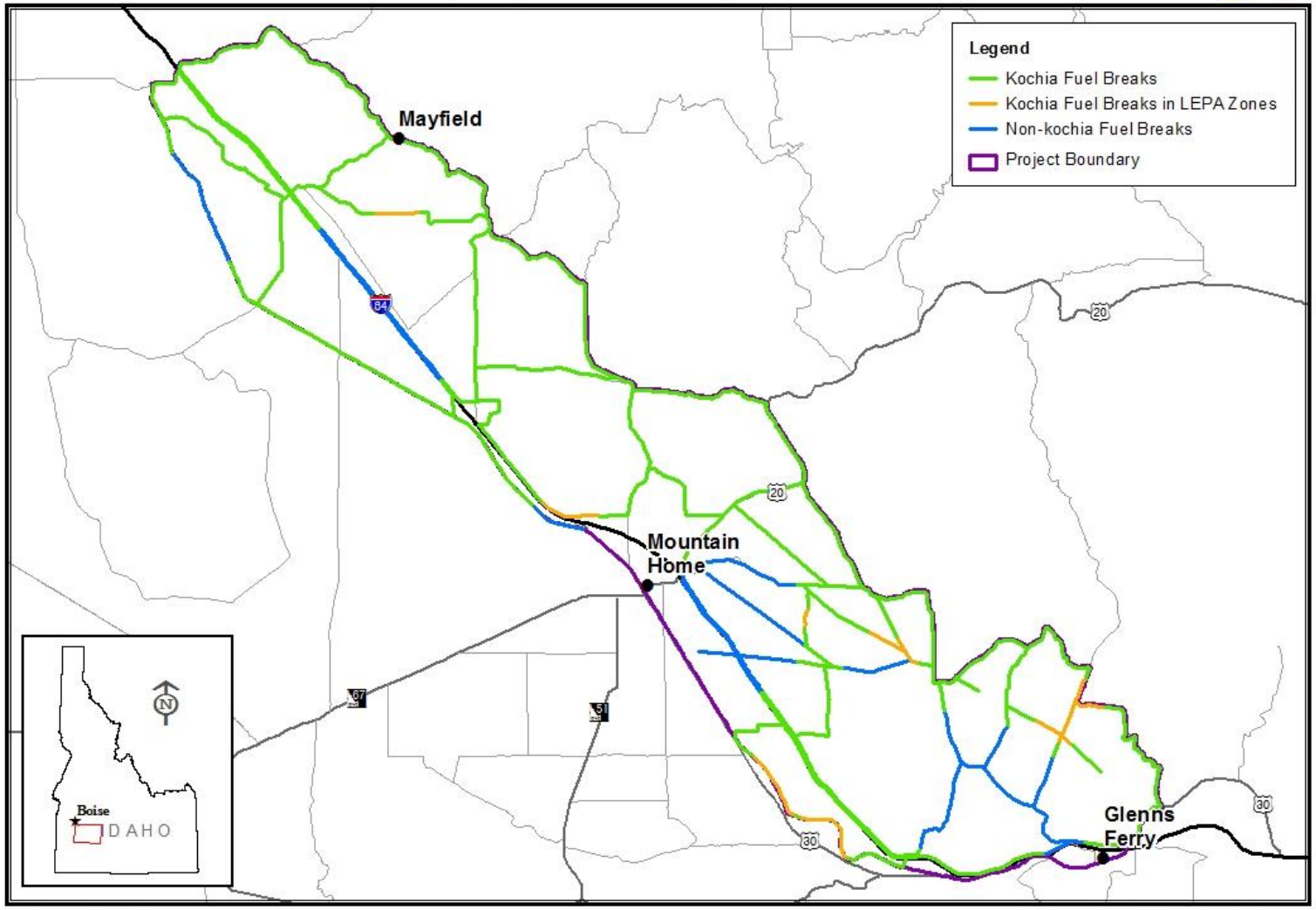
5. Alternative 2 - All Routes (Proposed Action)



The sources of the data are from Idaho-BLM Corporate Data.
2/23/2015

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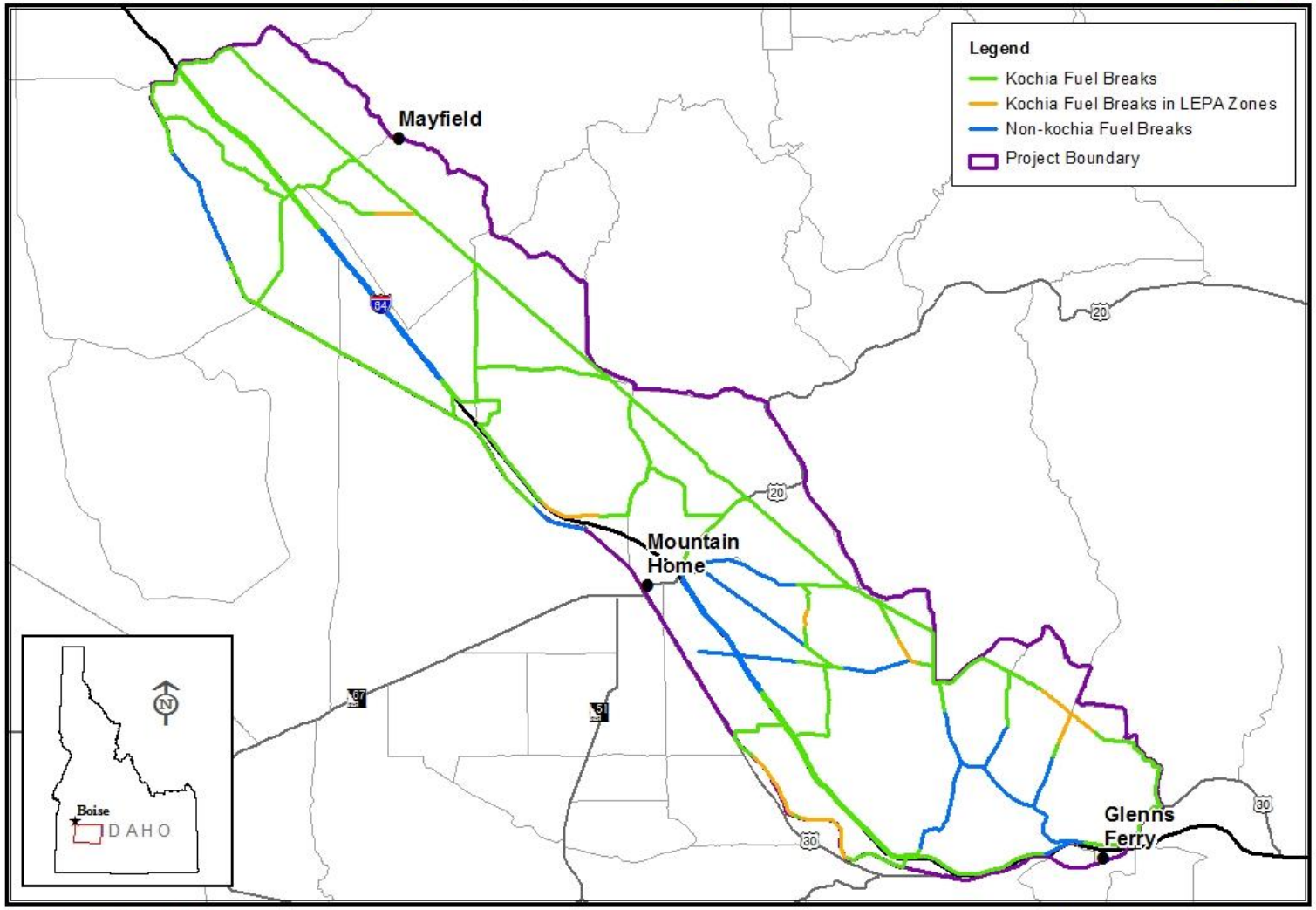
6. Alternative 3 - North Boundary Adjustment



The sources of the data are from Idaho-BLM Corporate Data.
2/23/2015

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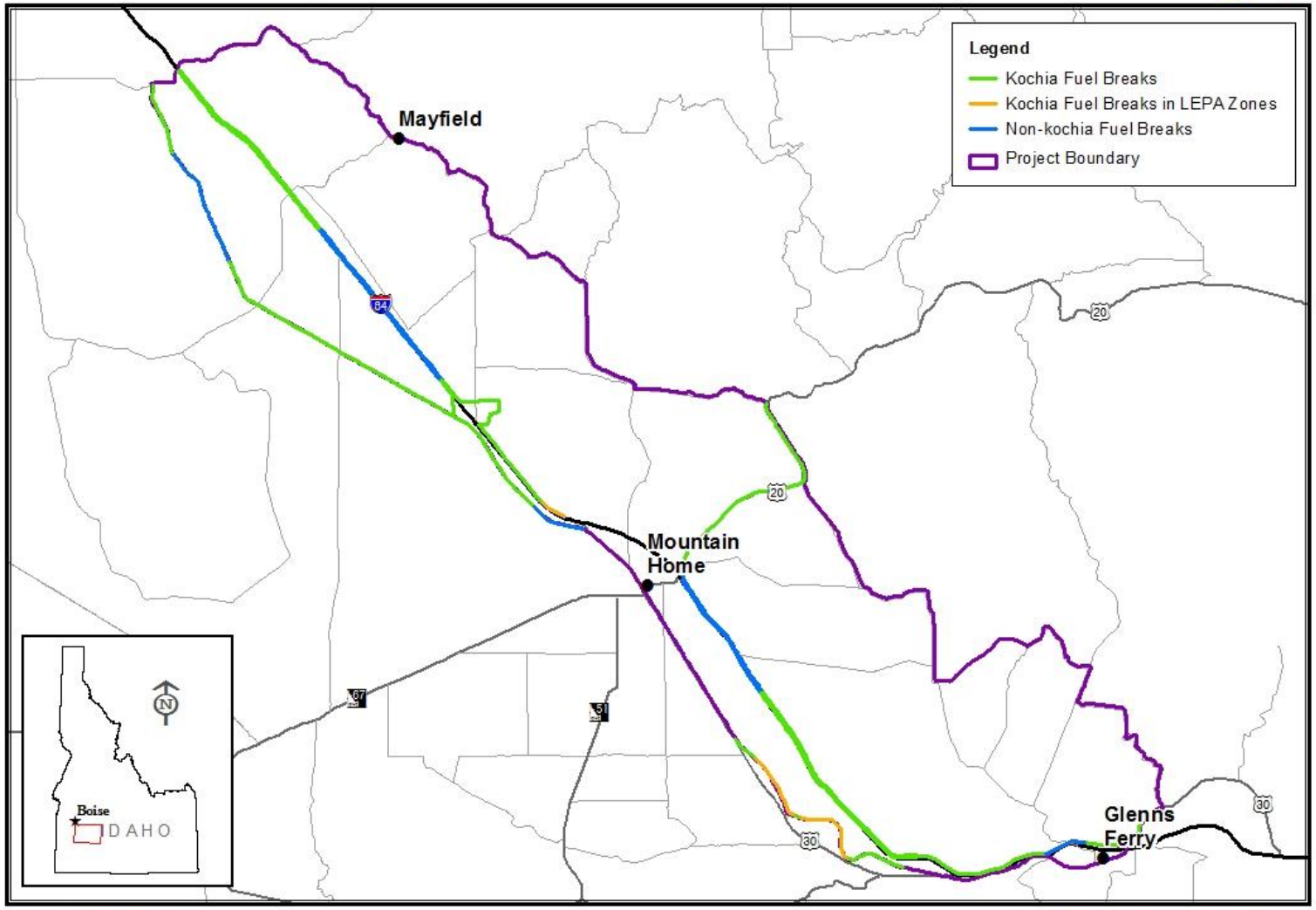
7. Alternative 4 - High Human Ignition Areas



The sources of the data are from Idaho-BLM Corporate Data.
2/23/2015

0 5 10 15 Miles

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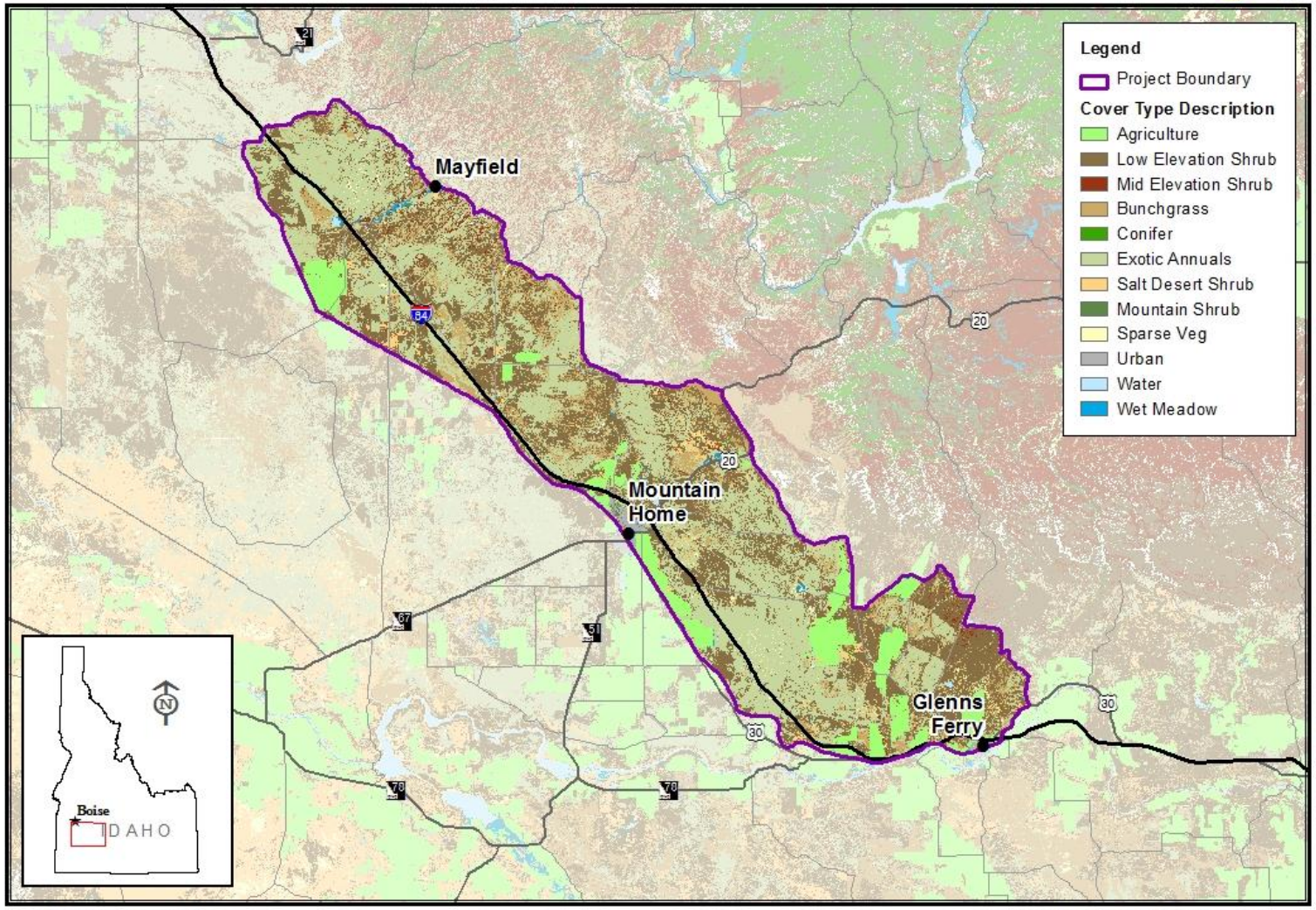
8. General Vegetation Cover Types



The sources of the data are from Idaho-BLM Corporate Data.
2/23/2015

0 5 10 20 Miles

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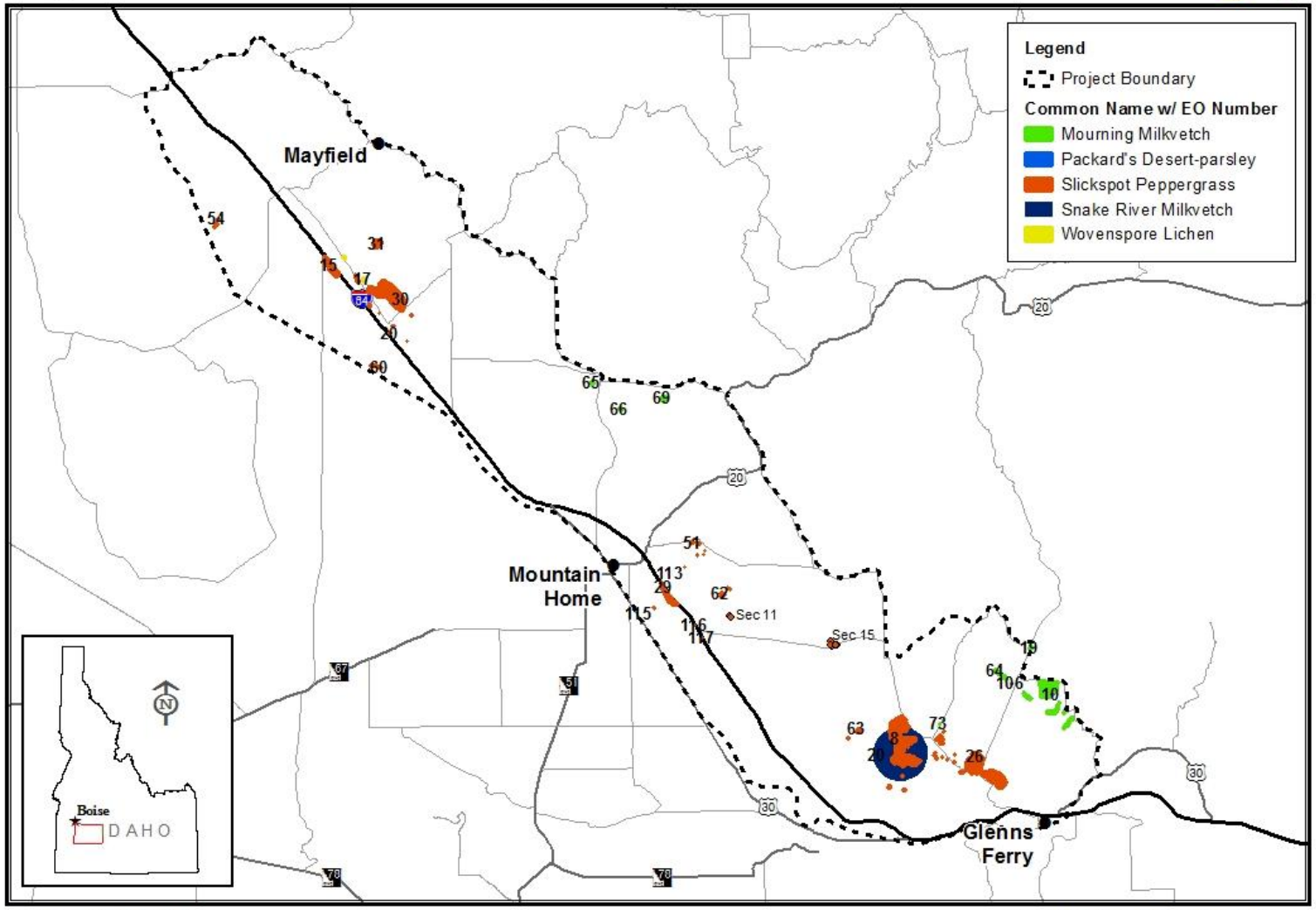
9. Special Status Plants Within Project Area



The sources of the data are from Idaho-BLM Corporate Data and Idaho State Fish & Game. 2/24/2015

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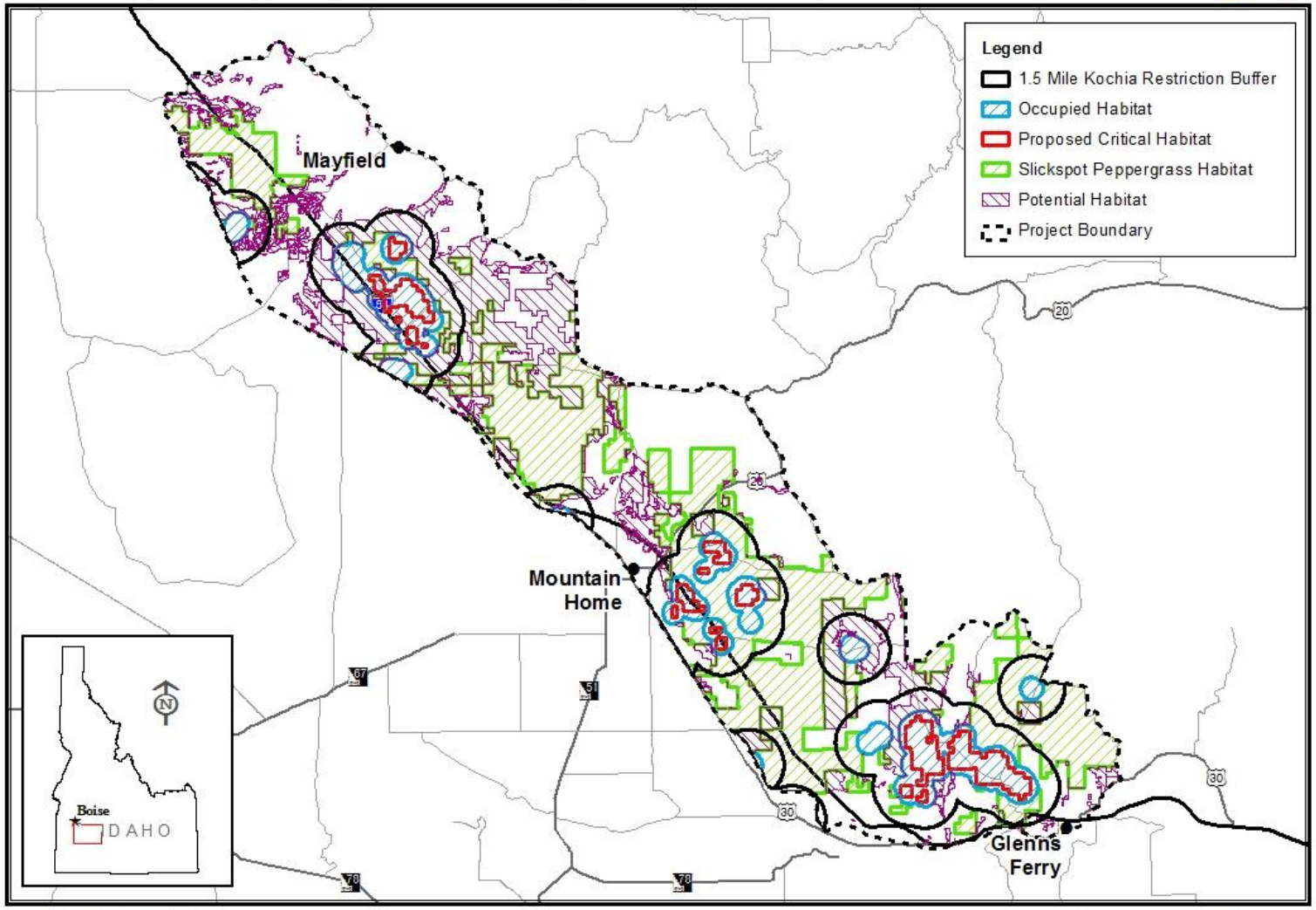
10. Slickspot Peppergrass Habitat Types Within Project Area



The sources of the data are from Idaho-BLM Corporate Data and Idaho State Fish & Game. 2/23/2015

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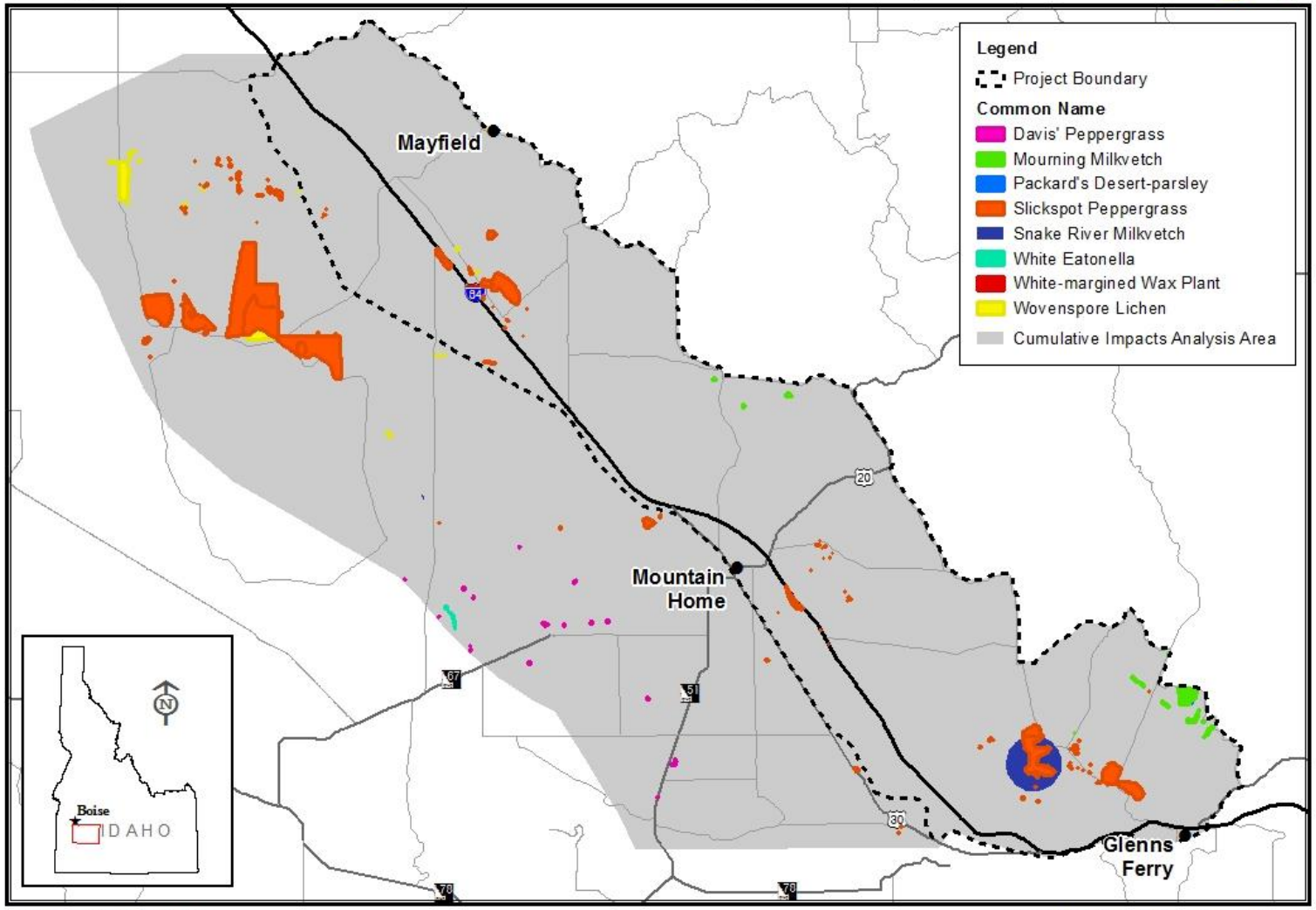
11. Special Status Plants Within Cumulative Impacts Analysis Area



The sources of the data are from Idaho-BLM Corporate Data and Idaho State Fish & Game. 2/23/2015

0 5 10 20 Miles

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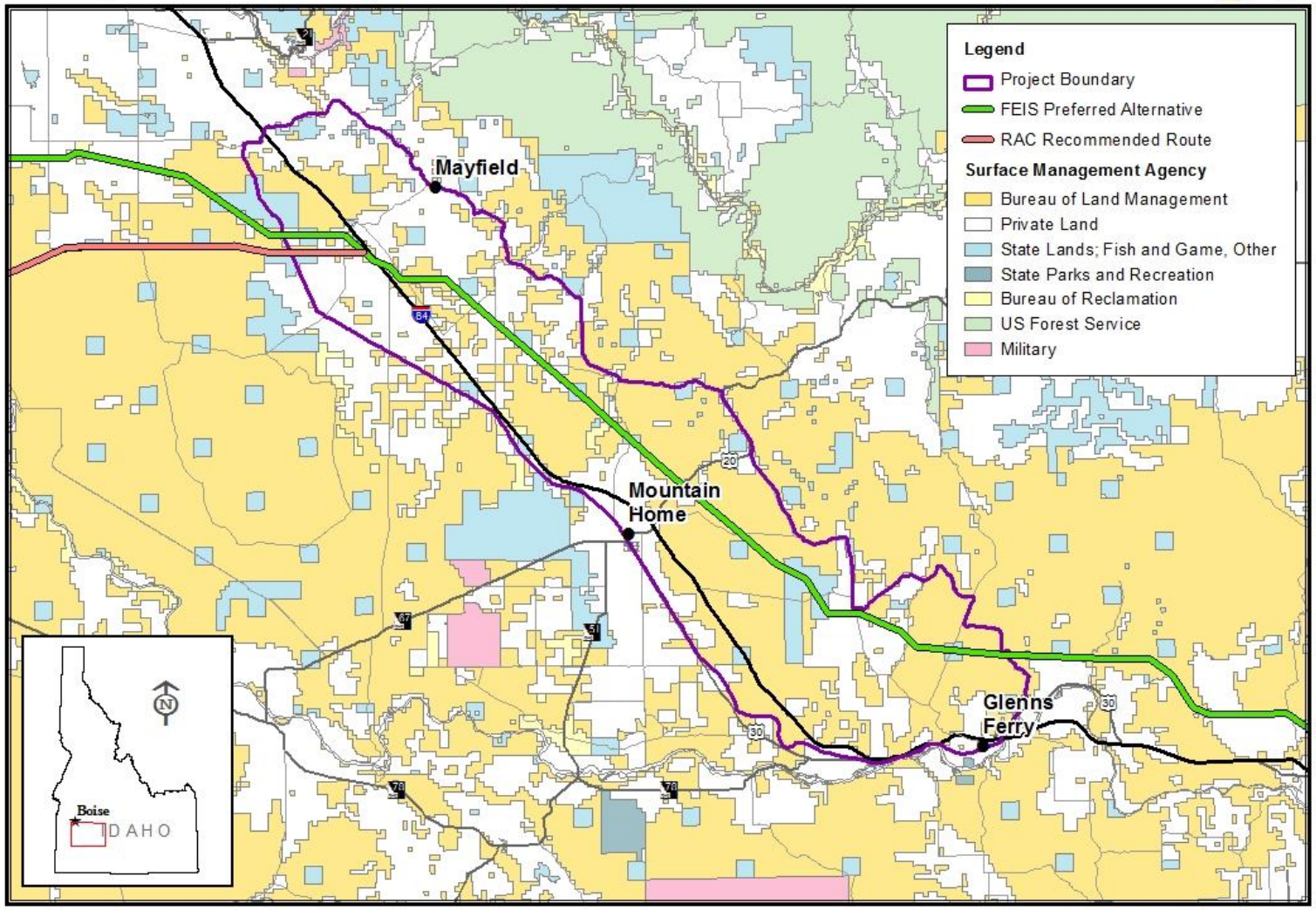
12. Segment 8 Gateway West Transmission Line

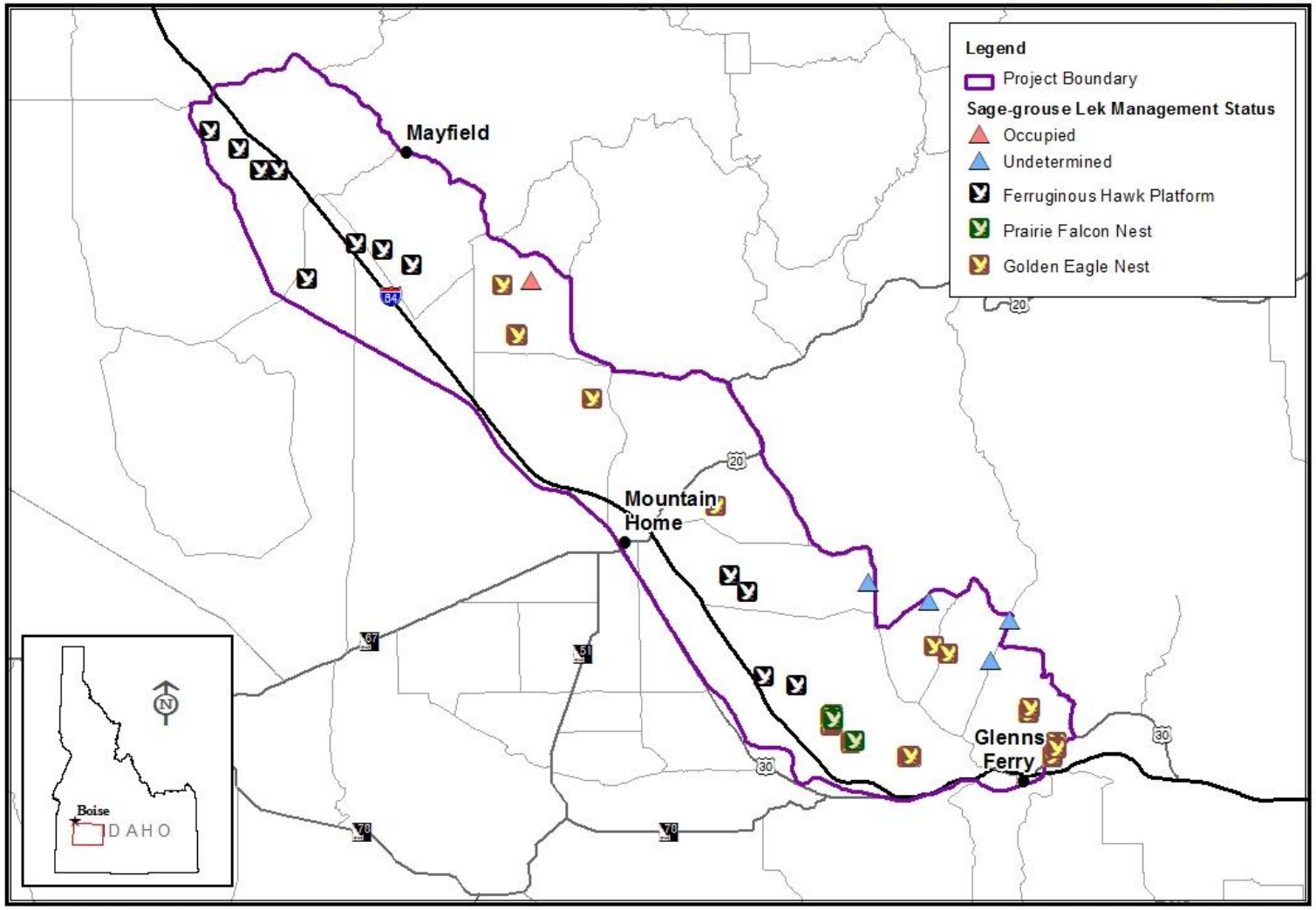


The sources of the data are from Idaho-BLM Corporate Data.
2/23/2015

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

13. Sage-grouse Leks and Sensitive Raptor Nest Sites Within Project Area



The sources of the data are from Idaho-BLM Corporate Data and Idaho State Fish & Game.
2/23/2015

0 5 10 20 Miles

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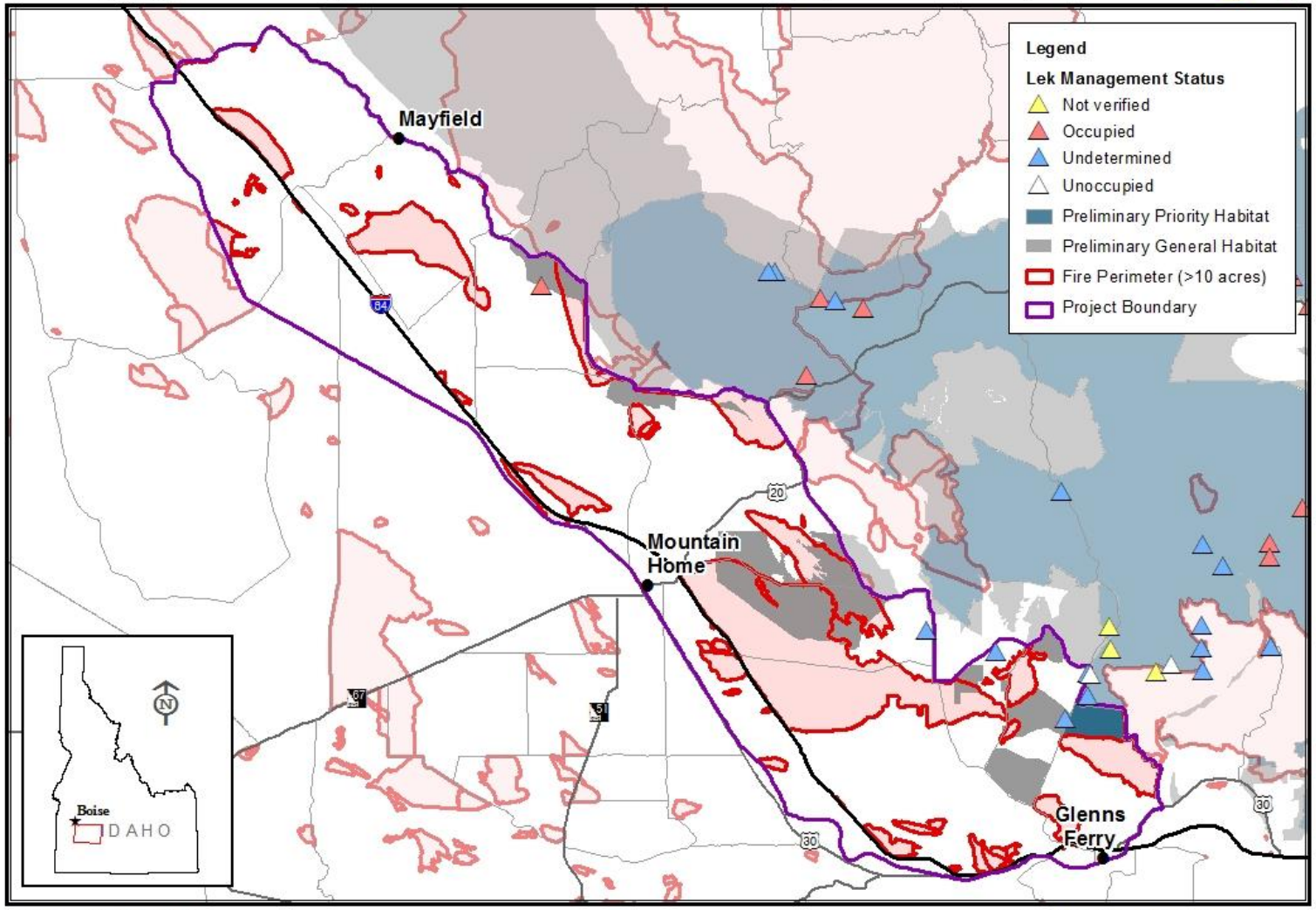
14. Sage-grouse PPH/PGH & Leks with Fire History (2010 - 2013)



The sources of the data are from Idaho-BLM Corporate Data and Idaho Dept. of Fish & Game.
2/23/2015

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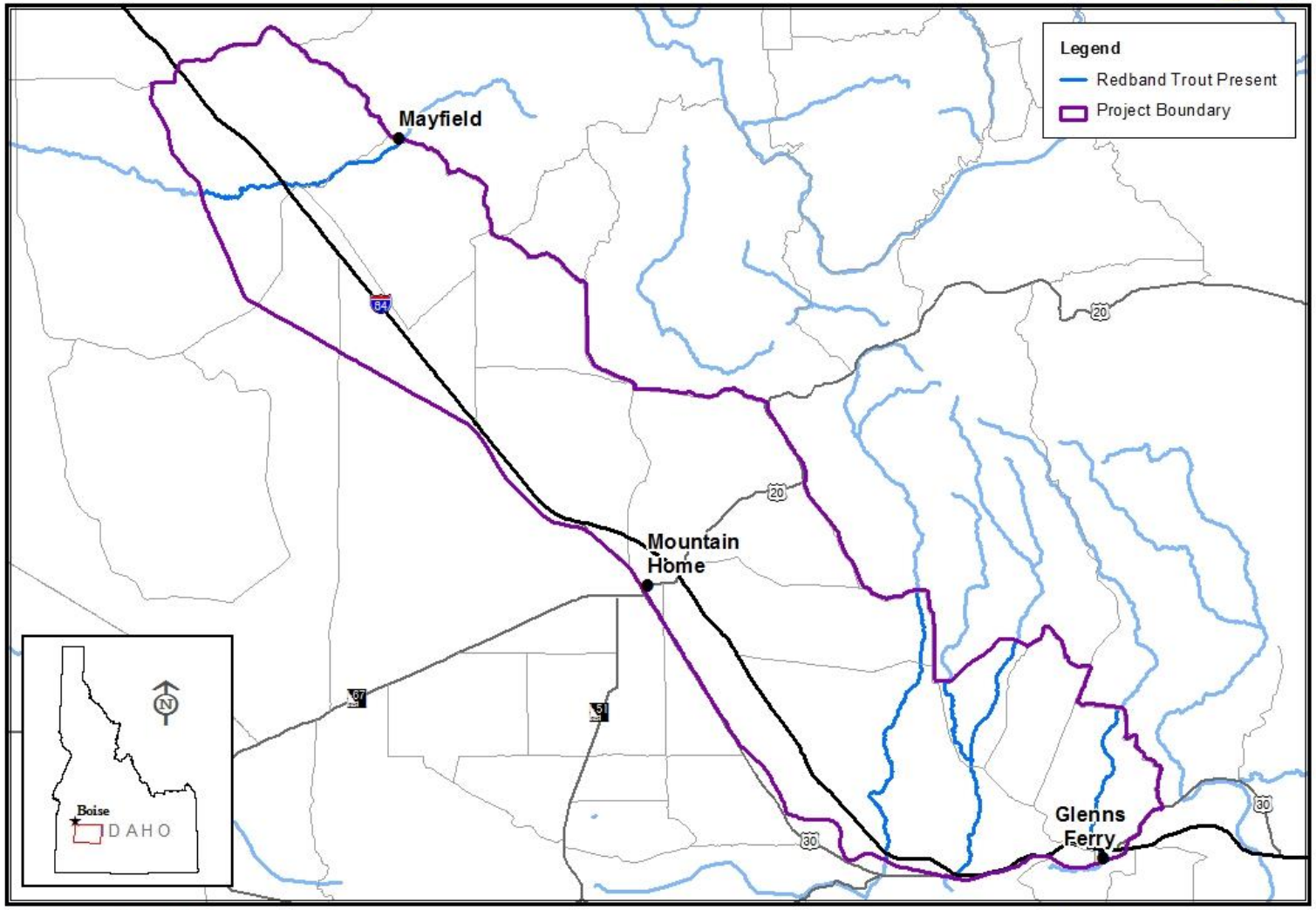
15. Fish Presence - Redband Trout



The sources of the data are from Idaho-BLM Corporate Data and Idaho Dept. of Fish & Game. 2/23/2015

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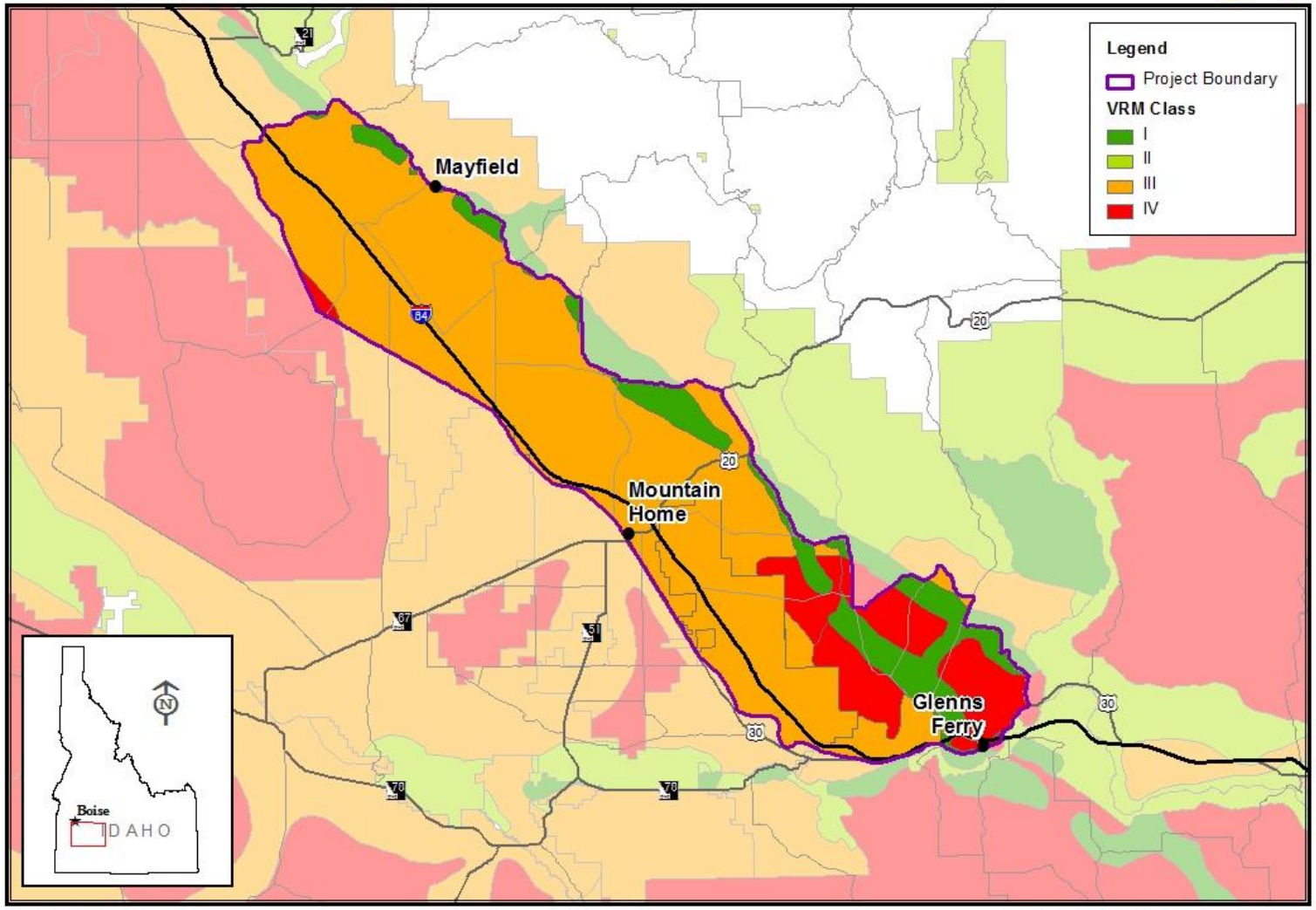
16. Visual Resource Management Classes



The sources of the data are from Idaho-BLM Corporate Data.
2/23/2015

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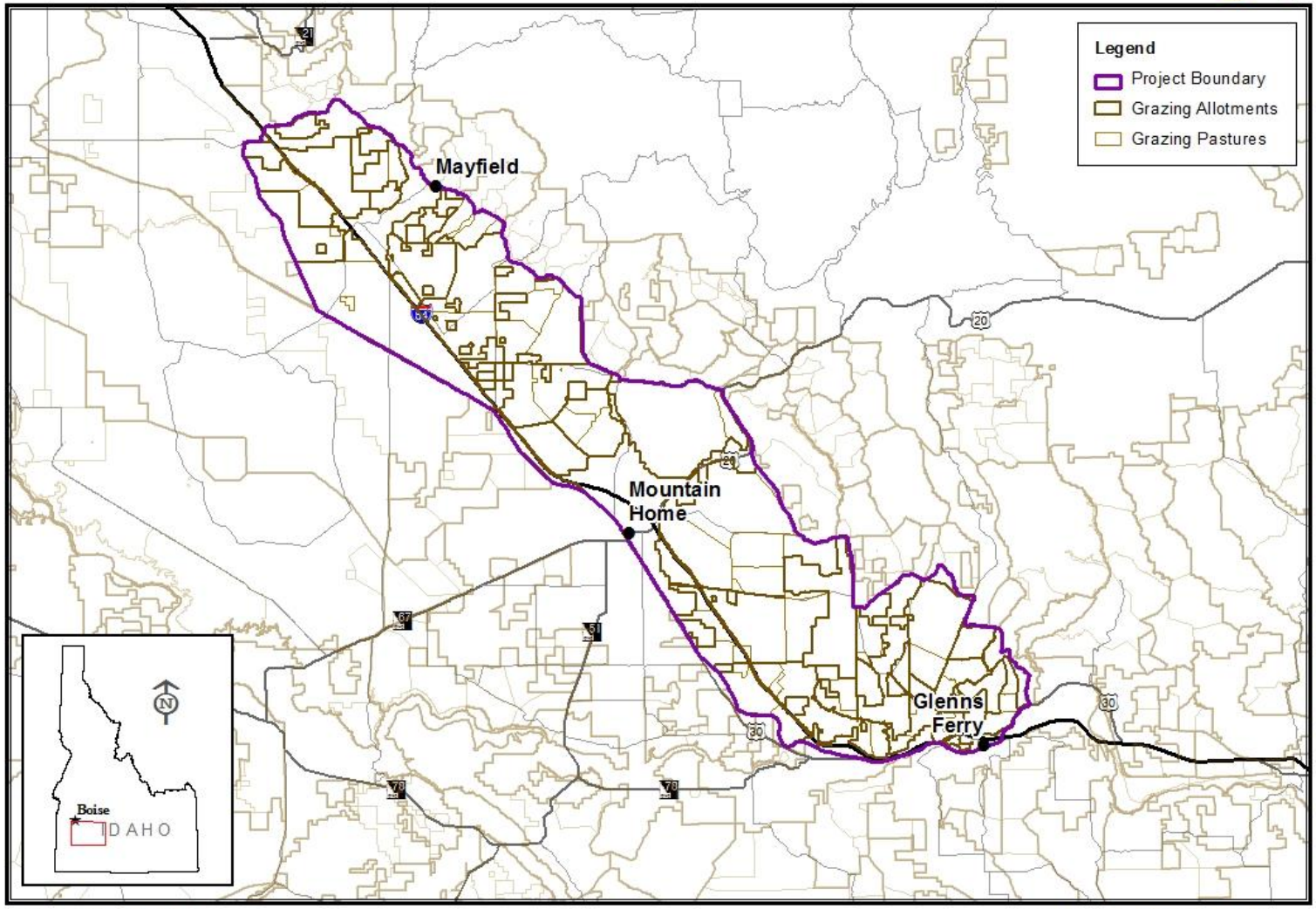
17. Grazing Allotments & Pastures



The sources of the data are from Idaho-BLM Corporate Data.
3/9/2015

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8.0 Attachment: NRCS Sage-grouse Initiative

United States Department of Agriculture

Natural Resources Conservation Service

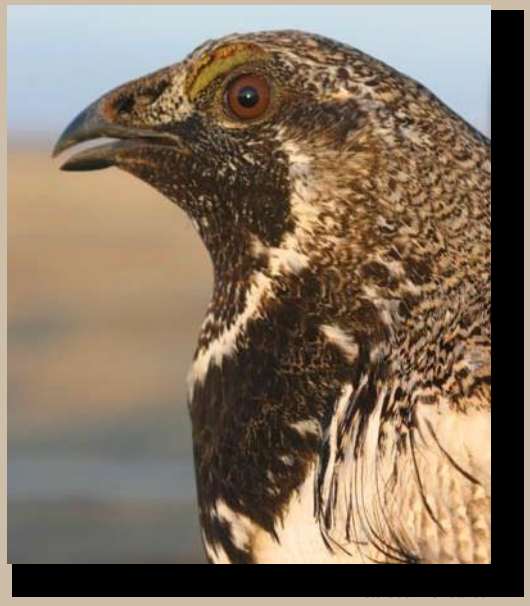
NRCS

Introduction to NRCS' New Sage-Grouse Initiative:

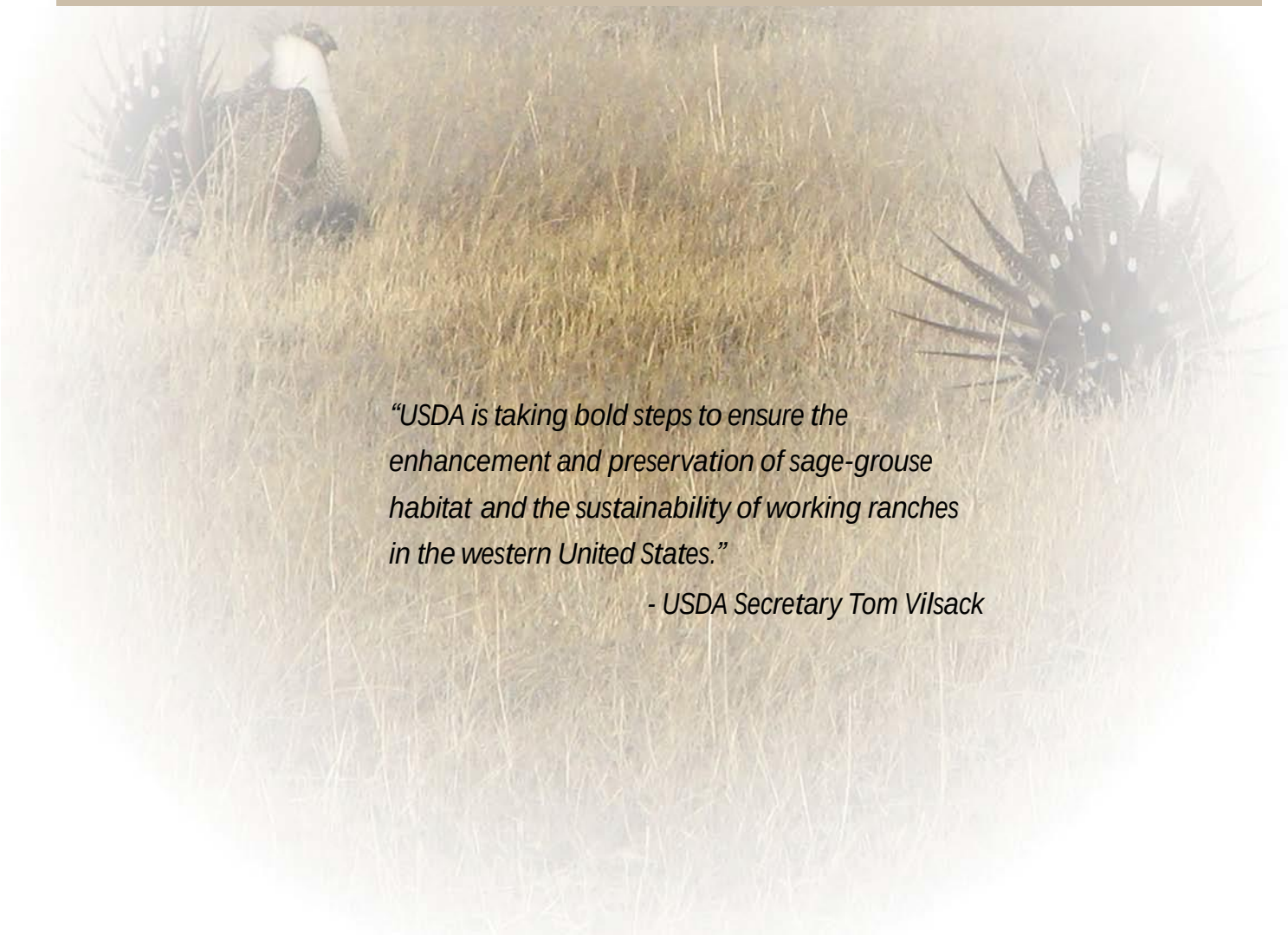
Wildlife Conservation Through Sustainable Ranching

SGI
Sage-Grouse Initiative

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

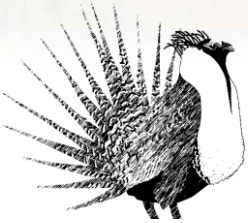
For the most part, the same factors that negatively affect sage-grouse also negatively affect the health, productivity, and sustainability of native grazing lands. Therefore, improvements to benefit sage-grouse also benefit grazing lands and the ranches that depend on them. Below are points of mutual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

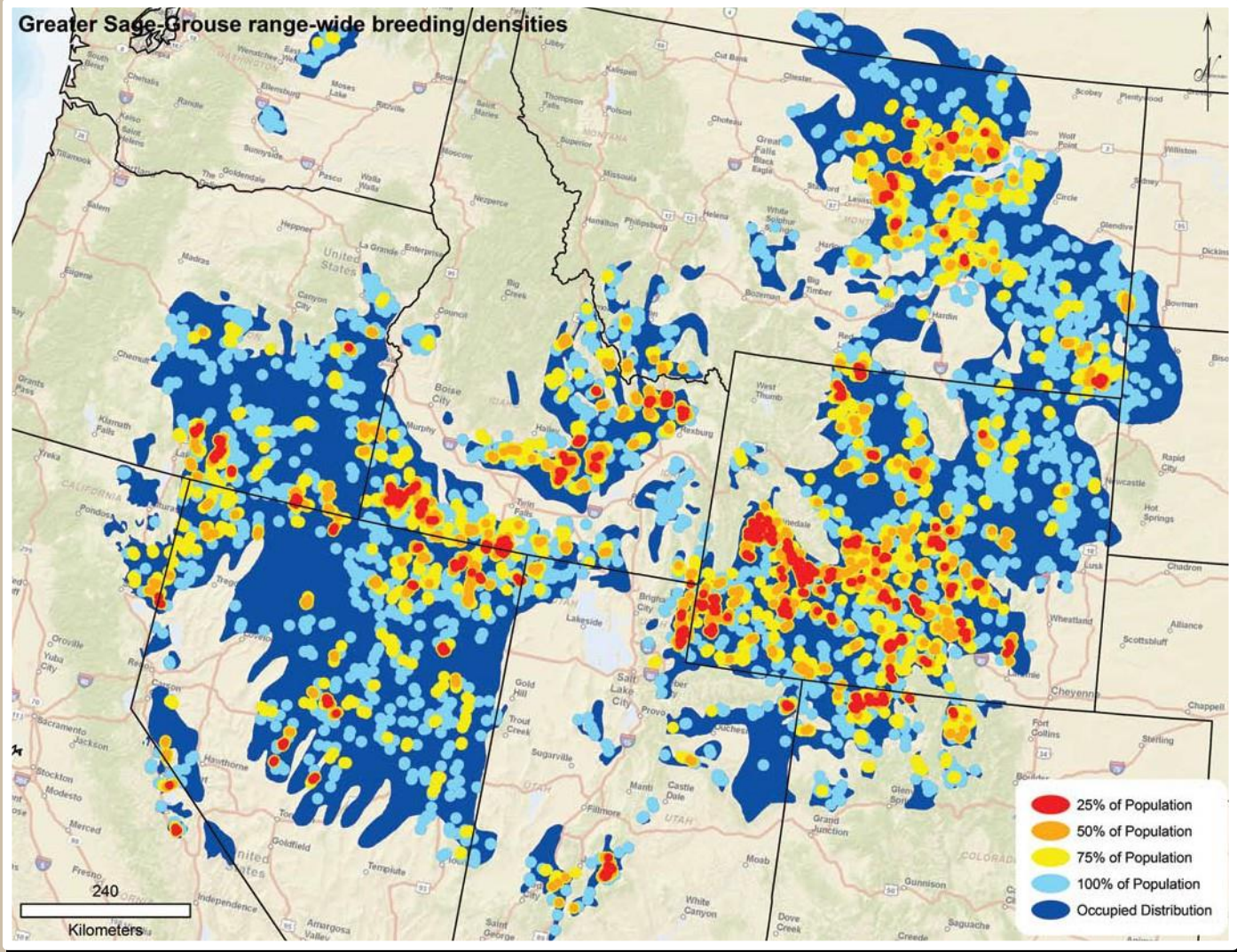
Beneficial for both

- 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





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

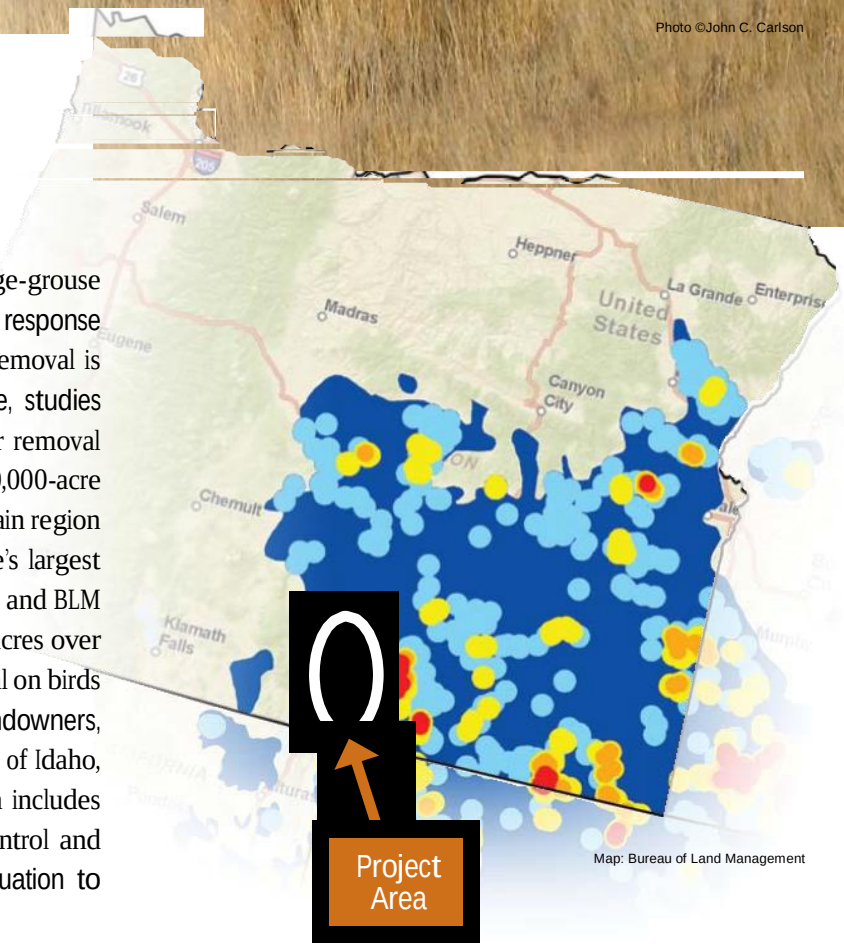
SGI research is conducted using birds fit with radio transmitters. This allows researchers to follow individual birds and measure changes in survival and reproduction that influence population growth.

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

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