BLM

U.S. Department of the Interior
Bureau of Land Management

Environmental Assessment
DOI-BLM-ID-B020-2009-0005-EA

Fuel Breaks to Maintain and Restore Sage-grouse Habitat

April 2013

U.S. Department of the Interior
Bureau of Land Management
Bruneau Field Office
3948 Development Avenue
Boise, ID 83705

Table of Contents

1.0. Introduction

Sagebrush steppe habitat and the wildlife species that depend on it are now among the most at risk in North America (Knick et al. 2003, p. 2; Dobkin & Sauder 2004, p. 1; Meinke et al. 2009, p. 652). The loss of sagebrush habitat to wildfire, and subsequent dominance by invasive annual grasses, is one reason greater sage-grouse (hereafter identified as sage-grouse) is a candidate for listing under the Endangered Species Act by the U.S. Fish and Wildlife Service (USFWS 2010a, p. 13931). Throughout the Snake River Management Zone for sage-grouse, which includes the Northern Great Basin subpopulation (NGB) (the project is in the NGB area), numbers of sage-grouse and acres of suitable habitat have declined, due in large part to wildfire and conversion of habitat to cheatgrass (*Bromus tectorum*). Out of 19 potential threats, the *Conservation Plan for the Greater Sage-grouse in Idaho* (ISAC 2006, p. 4-2 & 3) identifies wildfire as the highest ranked threat in terms of relative risk to sage-grouse, based on conclusions by the Idaho Sage-grouse Science Panel. The rationale for this ranking was due to several factors including the potentially large-scale impacts that fire can have on already fragmented habitat, fire's link with expanding annual grasslands, climate change, and slowness of habitat recovery times. Similarly, the Owyhee Sage-grouse Management Plan (Owyhee County Sage-grouse Local Working Group 2004, p. 4) states "Fire is the greatest single factor responsible for the loss of sage-grouse habitat in southeastern Owyhee County".

For several years in annual upland game reports, the Idaho Department of Fish and Game (IDFG) has identified wildfire as a threat to sage-grouse persistence in southwest Idaho. The 2010 report states, "Habitat management continues to be a major issue for the Department throughout the state. Wildfire frequency and size in the sagebrush steppe has increased, especially during the drought years, 1997-2007". For many years, IDFG has conducted telemetry studies in the Bureau of Land Management's (BLM) Bruneau Field Office (BFO), in order to "prioritize habitat protection and improve management efforts" (IDFG 2003-2010).

Based on years of collaborative data collection by BLM and IDFG personnel from lek counts, habitat evaluation, hunter harvest data, and telemetry studies, the southern portion of the BFO has been identified as a stronghold for sage-grouse, and an area containing some of the last remaining, extensive intact areas of sage-grouse habitat in southwestern Idaho (IDFG 2003-2010; Idaho Sage-grouse Advisory Committee 2006). The 12-month findings for sage-grouse, published by USFWS on March 23, 2010, states, "In addition, two strongholds of contiguous sagebrush habitat (the southwest Wyoming Basin and the Great Basin area straddling the States of Oregon, Nevada, and Idaho) contain the highest densities of males in the range of the species and are being impacted by direct habitat loss and fragmentation that will continue for the foreseeable future" (Wisdom et al. 2011 and Knick and Hanser 2011 p.13962; USFWS (2010) p. 13988).

The sage-grouse stronghold located in the BFO is within the Dissected High Lava Plateau Level IV Ecoregion of Idaho (McGrath et al. 2002) (Map 1. Ecoregions). Ecoregions stratify the environment by their probable response to disturbance, and are critical for structuring and implementing ecosystem management strategies across geographical areas (McGrath et al. 2002). The Dissected High Lava Plateau is characterized by alluvial fans, rolling plains, and shear-walled canyons. Sagebrush grassland is common, with scattered woodland on rocky

uplands (McGrath et al. 2002). This ecoregion covers the southwestern portion of Idaho, including areas where large fires have recently occurred, such as the 2007 Murphy Fire.

Wildfire can consume large tracts of sage-grouse habitat and present challenges to long-term sagebrush conservation (Miller et al. 2011, p. 145; Connelly and Braun 1997; Connelly et al. 2000a; Connelly et al 2000b; Miller and Eddlemen 2000, p. 21; and Knick and Hanser 2011). Restoration to pre-burn conditions in Wyoming and dry mountain big sagebrush habitats is difficult, costly, and a process that can take decades to accomplish (Pyke 2011). Nelle and others (2000) found that, even in mountain big sagebrush, burning had a long-term negative impact on nesting habitat; sagebrush required more than 20 years of post-burn growth for canopy cover to become sufficient for nesting. 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 also creates a plant community that will burn more frequently than sagebrush dominated systems. In many areas throughout the West, 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 and salt desert shrub communities. It is difficult, costly, and often requires multiple treatments to restore an area to sagebrush after annual grasses have become established (Connelly et al. 2004; Pyke 2011).

The 2010 USFWS 12-month finding for sage-grouse identifies the increasing risk to remaining intact sage-grouse habitat from wildfire and the value of conducting fuels management.

1. "Further, many climate scientists suggest that in addition to the predicted change in climate toward a warmer and generally wetter Great Basin, variability of inter-annual and inter-decadal wet-dry cycles will increase and likely act in concert with wildfire, disease, and invasive species to further stress the sagebrush ecosystem (Neilson et al. 2005, p. 152). The anticipated increase in suitable conditions for wildfire will likely further interact with people and infrastructure. Human-caused wildfires have reportedly increased and been shown to be correlated with road presence (Miller et al. 2011). Given the popularity of off-highway vehicles (OHV) and the ready access to lands in the Great Basin, the increasing trend in both wildfire ignitions by people and loss of habitat will likely continue. While multiple factors can influence sagebrush persistence, wildfire is the primary cause of recent large-scale losses of habitat within the Great Basin, and this stressor is anticipated to intensify" (p. 13934).

2. "The loss of habitat due to wildfire is anticipated to increase due to the intensifying synergistic interactions among fire, people, invasive species, and climate change" (Ibid).

3. "Targeting the protection of important sage-grouse habitats during wildfire suppression and fuels management activities could help reduce loss of key habitat due to wildfire if directed through a long-term, regulatory mechanism" (p. 13977).

4. "A regulatory mechanism that requires BLM staff to target the protection of key sage-grouse habitats during wildfire suppression or appropriate fuels management activities could help address the threat of wildfire in some situations. We recognize the use of IMs

for this purpose, including both at the national and State level (Idaho) (BLM 2008) and 2008k); however, a long-term mechanism is necessary given the scale of the wildfire threat and its likelihood to persist on the landscape in the foreseeable future" (p. 13979).

5. "Barring alterations to the current wildfire pattern, as well as the difficulties associated with restoration, the concerns presented by this threat will continue and likely strongly influence persistence of the sage-grouse, especially in the western half of its range within the foreseeable future" (p. 13935).

In the BFO, risk of large-scale wildfire is greatest during summer when thunderstorms, with associated lightning, occur. When lightning-ignited wildfires start in the BFO, there are usually multiple ignitions across the Boise District, as well as neighboring BLM and Forest Service districts. The BLM policy of prioritizing wildfire suppression efforts in order of importance are; life, property, and natural resources. When multiple wildfires occur, firefighting resources are prioritized according to this hierarchy. The Boise District has a historically high level of wildfire activity, burning approximately 88,196 acres a year and averaging 107 wildfires per fire season, over a 25-year period (1985 - 2009) (Boise BLM data). In high fire activity years, there have been as many as 166 wildfires, with 153,539 acres burned (Ibid).

During multiple wildfire event days, fires threatening life and property will receive higher priority than fires threatening natural resources. When this happens, securing sufficient firefighting resources in a timely manner is often a challenge because, in many instances, there are simply not enough to go around. Under these circumstances, large areas of unburned sage-grouse habitat, such as those occurring in the BFO, are most at risk to large-scale wildfire. Indeed, such was the case with the 2007 Murphy Complex and Tongue Complex fires, 2010 Long Butte and Crowbar fires, 2011 Big Hill fire, and the 2012 Jacks Fire.

The BLM has considered options to reduce fire spread/intensity to protect natural resources. One factor in the analysis was the likelihood that, given higher response priorities, fire suppression within undeveloped habitat areas outside of the wildland-urban interface would receive less attention. One avenue to reduce fire spread/intensity involves the development of fuel breaks. The effectiveness of an established fuel break next to a road was documented on July 12, 2012 in the Upper Snake River Field Office. In the spring of 2012 the Upper Snake Field Office implemented the first phase of the Big Desert Fuel Breaks Project as identified in the March 2012 Environmental Assessment of the Big Desert Roads Fuel Breaks Project DOI-BLM-ID-I010-2011-0014-EA. Fuel break construction was initiated on April 30, 2012 and consisted of roto-mowing the existing vegetation to a height of roughly 8 inches at a distance between 100-150 feet 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 Service (NPS) portion of the Craters of the Moon National Monument and Preserve (CMNMP). Strong, gusty winds and hot, dry conditions allowed the fire to quickly spread to the north, east, and south through the CMNMP and cross into BLM lands in the Upper Snake Field Office. Suppression operations of the Cox's Well Fire 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 failed to produce results, crews backed out to the Arco/Minidoka Road and started improving the road grade and back burning off the road. Portions of the Arco/Minidoka Road

were treated during the spring of 2012 to establish a fuel break. The fuel break ultimately aided in suppression operations. During firing operation of 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 a back burn operation that was instrumental in controlling this wildfire (see Ben Dyer 2012, Appendix 7.4).

1.1 Purpose and Need for Action

The southern portion of the Bruneau Field Office was identified, by the Oregon/Idaho/Nevada Cooperative Shrub-Steppe Restoration Partnership and BLM's Healthy Land Initiative Conservation Policy Team (USDI 2010), as being in a high risk category for large-scale wildfire (Map 3. Large Fire Risk). The project area is on the northern edge of the stronghold for sage-grouse (Map 4. Sage-grouse key and preliminary priority habitat) and provides habitat for many wildlife species, including sagebrush obligates (ISAC 2006). Depending on weather, fuel conditions, availability of firefighting resources, and other factors, wildfires can affect hundreds of thousands of acres in a single fire season. The importance of the project area habitat, the area's remoteness, and the potential for few available resources and long firefighter response times necessitate that strategic measures be undertaken should wildfires, especially multiple starts, occur.

Proactive fuels treatments, such as fuel breaks, would reduce impacts from suppression efforts. Dozers are one of the most effective tools in containing wildfire in sagebrush steppe habitat. Construction of several miles of dozer line can be developed to control a single wildfire, both in and around the burned area. Since 2010, over 150,000 acres of sagebrush habitat was burned in the BFO, and 101 miles of dozer line were constructed (Table 1).

Table 1. Approximate acres burned and miles of dozer line constructed during 2010-2012 in the BFO

2010 Wildfires	**Acres Burned**	**Miles of Dozer Line**
Blacksheep	4,337	13
Crowbar	29,500	12
Notsohot	19	0
Pot	722	3.5
Rizzi	10	0
Shugga	120	1
Sugar Valley	166	3
Table	56	1
Turn	590	5
Total 2010	**35,520**	**38.5**
2011 Wildfires	**Acres Burned**	**Miles of Dozer Line**
Angle	78	3
Big Hill	67,068	39.5
Castle	33	1
Deep	70	0
Total 2011	**67,248**	**43.5**

2012 Wildfires	Acres Burned	Miles of Dozer Line
East Rock	2,688	7.0
Tindall	3,223	11.5
Jacks Fire	48,894	0.5
Total	**54,805**	**19**
Total for 2010-2012	**157,573**	**101**

To address the threat of wildfire in a 420,391-acre area of the BFO, the Boise District BLM proposes to develop a strategic fuel breaks system or network along 128 miles of roads to maintain and protect habitat for the Northern Great Basin sage-grouse population. Fuel breaks in areas that have already been degraded by wildfire would augment restoration of suitable habitat.

Since this planning effort began, over 100,000 acres within the project area have burned. The Jacks Fire that occurred in July 2012 burned approximately 48,894 acres, of which nearly 100% was preliminary priority habitat for sage-grouse. Seventeen miles of mowing was dropped from the alternatives due to the Jacks Fire.

The proposed action would maintain and protect habitat for sage-grouse and other wildlife within the project area and provide a greater margin of safety for firefighters (Map 2. Project Vicinity). Proactive wildfire management strategies that reduce large wildfire risk and maximize the potential for effective suppression are necessary to prevent further degradation and habitat loss for sage-grouse and other wildlife species in the BFO (ISAC 2006) and promote restoration of areas that have already burned.

In the 1983 Bruneau Management Framework Plan (MFP), Objective WL: 2 states that BLM should manage sensitive species habitat to maintain or increase potential populations. Increased habitat protection, from wildfire, is needed because it is considered the highest threat to sage-grouse persistence in Idaho. The need for habitat protection is also identified in the 12-month findings for sage-grouse and in the Idaho Sage-grouse Advisory Committee's 2006 Conservation Plan for Greater Sage-Grouse (USFWS 2010a, 13935; ISAC 2006, P. 4-2 & 3).

Implementation of a network of strategically placed, roadside fuel breaks would help achieve the following project objectives:

- Protect important habitat for Southwest Idaho's densest sage-grouse population and sagebrush-obligate species.
- Reduce the probability of wildfires consuming large acreages across the BFO.
- Enhance firefighter options to safely engage wildfires in a remote location, i.e., fuel breaks can serve as anchor points from which to initiate burn-out operations to reduce potential wildfire spread.
- Minimize acreage where sagebrush cover is lost and at risk of conversion to annual grassland from repeated wildfire.
- Reduce the cost of wildfire rehabilitation by reducing fire size.

1.2 Decision(s) to be Made

The BFO Field Manager will decide whether to maintain existing and develop new fuel breaks to facilitate the maintenance, protection, and restoration of sage-grouse habitat. The BFO Field Manager will also decide whether to maintain and/or develop fuel breaks to provide suitable areas for firefighters to safely and effectively engage wildfire along approximately 128 roadside miles within the project area.

1.3 Summary of Proposed Action

The proposed action includes developing a network of fuel breaks along 128 miles of road to restore and maintain sage-grouse habitat and enhance firefighting capability. Fuel breaks would be created and maintained using a combination of treatments, including mowing roadside shrubs, application of BLM-approved herbicides, and rangeland seeding (Table 2).

Mowing roadside vegetation would occur on approximately 75 miles and be 100 feet wide (i.e., 50 feet on each side or 100 feet on one). Mowing in key habitat would impact 800 acres of roadside shrubs or 0.5% of the key habitat in the project area. In habitat classified as preliminary priority, mowing would impact 694 acres of roadside shrubs or 0.5% of the preliminary priority habitat in the project area. Boise District fire operations personnel identified 50 feet as the minimum width to improve firefighter safety during suppression efforts while trying to minimize impacts to shrub habitat from proposed treatments.

Approximately 53 miles of greenstrips would be developed or maintained in areas that have previously burned, some multiple times, and are under threat of re-burn due to presence of cheatgrass. Greenstripping is the practice of establishing or using patterns of fire resilient vegetation and/or material to reduce wildfire occurrence and size (St. John and Ogle 2009). Developed and existing greenstrips would be up to 300 feet wide (i.e., 150 feet on each side or 300 feet on one). Vegetation selected for seeding greenstrips would consist of a combination of bluegrass and fescue species, squirreltail, inland saltgrass, and other low-statured grasses. Forage kochia (*Kochia prostrata*) would be used where competition from annual grasses is high and grass species would be expected to have difficulty becoming established. Forage kochia would not be used within 0.5 mile of playas supporting Davis' pepperweed. Greenstrip maintenance and improvement would include herbicide use and/or seeding.

Herbicides approved for use on BLM rangelands would be applied pre- and post-treatment where undesirable species encroach into greenstrips and mowed areas. Inventory and monitoring would be used to identify increased levels of cheatgrass and weeds in treated areas.

The annual treatment target would be 50 to 75 miles of roadsides. The proposed action may take up to 5 years to implement. Re-mowing of fuel breaks would occur 7-10 years after initial treatment. Maintenance needs of greenstrips would be identified through monitoring and completed as needed.

Table 2. Miles of roadsides to be treated and the number of acres impacted.

Treatment	Proposed Action
Mowing	75 Miles/909 Acres
Maintenance of Existing	42 Miles/1,527 Acres

Greenstrip	
New Greenstrip	11 Miles/400 Acres
Total Miles/Acres	128 Miles/2,836 Acres

1.4 Location and Setting

The project area is located in southwestern Idaho, extending from approximately 17 miles south of the community of Bruneau to Wickahoney Road, west side of State Highway (SH) 51 and Blackstone Reservoir Road, east side of SH 51 (Map 2. Bruneau Fuel Breaks). It is bounded to the east by the Bruneau Canyon and the west by Upper Battle Creek watershed. The project area encompasses 420,391 acres.

Approximately 95% of the project area lies within the Dissected High Lava Plateau Level IV Ecoregion of Idaho (McGrath et al. 2002) (Map 1. Ecoregions). The plateau is characterized by alluvial fans, rolling plains, and shear-walled canyons. Sagebrush grassland is common, with scattered woodland on rocky uplands (McGrath et al. 2002).

Annual moisture varies from as low as six inches at lower elevations to more than 16 inches in higher areas. Most precipitation occurs in late fall through early spring. Late summer is normally the driest period with annual monsoonal or dry thunderstorms. Temperature extremes vary from the high 90s in July/August to sub-zero in December/January. Temperatures are generally moderate, but day and night temperatures can vary as much as 50 degrees.

1.5 Conformance with Applicable Land Use Plans, Statutes, Regulations, Other Management Requirements, and Applicable Conservation Direction

Project development was guided by management direction and objectives identified in the following:

Bruneau Management Framework Plan - The project is in conformance with management direction established in the Bruneau MFP, approved on March 30, 1983. Although fuel breaks are not specifically mentioned, the proposed action supports the following objectives:

- Manage sensitive species habitats to maintain existing or potential populations (WL-2).
- Manage upland game and waterfowl habitats in the Bruneau Planning Unit to increase populations of these highly desirable species (WL-4)

Conservation Plan for the Greater Sage-grouse in Idaho - The Idaho BLM generally manages sage-grouse habitat in accordance with the Idaho Sage-grouse Advisory Committee's 2006 Conservation Plan for Greater Sage-Grouse (Conservation Plan). Idaho BLM IM 2009-006, in part, directs managers to utilize this Conservation Plan as a reference resource to support and guide NEPA analyses. The 2006 plan's primary purpose is to maintain, improve, and, where possible, increase sage-grouse populations and habitats in Idaho, while considering the predictability and long-term sustainability of a variety of land uses. The Conservation Plan includes population and habitat objectives, and conservation measures to address identified threats, so the overall objectives can be achieved.

During the plan's preparation, wildfire was identified by the Idaho sage-grouse Science Panel as the highest ranked threat to sage-grouse and its habitat in the state. Consequently, the Conservation Plan provides a number of conservation measures concerning wildfire suppression, planning, education, and restoration. One aspect of the wildfire conservation measures' goal is: To reduce the risk, incidence and extent of wildfires within Sage-grouse Planning Areas.

On page 4-18 of the Conservation Plan, Measure 6 recommends land managers: Strategically place pretreated strips/areas (e.g., mowing, herbicide application, strictly managed grazing strip, etc.) to aid in controlling wildfire should wildfire occur near critical habitats.

The BLM Washington Office IM 2011-138; Sage-Grouse Conservation Related to Wildfire and Fuels Management - The purpose of IM 2010-138 is to provide guidance and resources to augment protection of sage-grouse habitats and populations on BLM jurisdictions. Within the guidance provided, the IM identifies Best Management Practices (BMPs) applicable to fuels management. Several of the BMPs are directly incorporated into this project, such as:

- Strategically place and maintain pretreated strips/areas (e.g. mowing, herbicide, and strictly managed grazed strips) to aid in controlling wildfire should wildfire occur near key habitat or important restoration areas (such as where investments in restoration have already been made).
- Where applicable, design fuels treatment objectives to protect existing sagebrush ecosystems, modify fire behavior, restore native plants, and create landscape patterns which most benefit sage-grouse habitat.
- Design vegetation treatments in areas of high fire frequency to facilitate firefighter safety, reduce the risk of extreme fire behavior, and reduce the risk and rate of fire spread to key and restoration habitats.
- Where appropriate, ensure that treatments (strips) are configured in a manner that promotes use by sage-grouse.
- Where applicable, incorporate roads and natural fuel breaks into fuel break designs.
- Emphasize the use of native plant species, recognizing that non-native species may be necessary depending on the availability of native seed and prevailing site conditions.
- Ensure proposed sagebrush treatments are planned with interdisciplinary input from BLM and/or state wildlife agency biologists, and that treatment acreage is conservative in the context of surrounding sage-grouse seasonal habitats and landscape.

BLM Washington Office IM 2012-043; Greater Sage-Grouse Interim Management Policies and Procedures - This IM provides interim conservation policies and procedures to the BLM field offices to be applied to ongoing and proposed authorizations and activities that affect the sage-grouse *(Centrocercus urophasianus)* and its habitat while BLM and USFS land use plans are being amended during the next 2 to 3 years. Interim conservation policies and procedures for Wildfire Suppression and Fuels Management were incorporated into this EA include:

- Threatened, endangered, and sensitive species (including sage-grouse) and associated habitats will continue to be a high natural resource priority for National and Geographic Multi-Agency Coordination Groups, whose purpose is to manage and prioritize wildland

fire operations on a national and geographic area scope when fire management resource shortages are probable.

- Sage-grouse protection and habitat enhancement is a high priority for the fire management program. A full range of fire management activities and options will be utilized to sustain healthy ecosystems (including sage-grouse habitats) within acceptable risk levels. Local agency administrators and resource advisors will convey protection priorities to incident commanders.
- Comply with the policies established in WO-IM-2011-138 (Sage-Grouse Conservation Related to Wildland Fire and Fuels Management) or successor guidance, regarding suppression operations and fuels management activities.

BLM Washington Office IM 2012-044; National Greater Sage-Grouse Land Use Planning Strategy - This Instruction Memorandum (IM) provides direction to the Bureau of Land Management (BLM) for considering Greater Sage-Grouse conservation measures identified in the Sage-Grouse National Technical Team's - *A Report on National Greater Sage-Grouse Conservation Measures* during the land use planning process that is now underway in accordance with the 2011 *National Greater Sage-Grouse Planning Strategy*. This direction is to be incorporated into project design until the planning process is complete.

- Do not reduce sagebrush canopy cover to less than 15% (Connelly et al. 2000, Hagen et al. 2007) unless a fuels management objective requires additional reduction in sagebrush cover to meet strategic protection of preliminary priority sage-grouse habitat and conserve habitat quality for the species. Closely evaluate the benefits of the fuel break against the additional loss of sagebrush cover in the EA process.
- Apply appropriate seasonal restrictions for implementing fuels management treatments according to the type of seasonal habitats present in a priority area.
- Allow no treatments in known winter range unless the treatments are designed to strategically reduce wildfire risk around or in the winter range and will maintain winter range habitat quality.
- Monitor and control invasive vegetation post-treatment.
  Rest treated areas from grazing for two full growing seasons unless vegetation recovery dictates otherwise (WGFD 2011).
- Require use of native seeds for fuels management treatment based on availability, adaptation (site potential), and probability of success (Richards et al. 1998).
  Where probability of success or native seed availability is low, non-native seeds may be used as long as they meet sage-grouse habitat objectives (Pyke 2011).
- Design post fuels management projects to ensure long term persistence of seeded or pretreatment native plants. This may require temporary or long-term changes in livestock grazing management, travel management, or other activities to achieve and maintain the desired condition of the fuels management project (Eiswerth and Shonkwiler 2006).
- Design fuels management projects in preliminary priority sage-grouse habitat to strategically and effectively reduce wildfire threats in the greatest area. This may require fuels treatments implemented in a more linear versus block design (Launchbaugh et al. 2007).

Owyhee County Sage-grouse Local Working Group's Plan - The Owyhee Local Working Group (LWG) identified wildfire as the greatest single factor responsible for the loss of sage grouse habitat in southeastern Owyhee County. Their plan states: "Many of the wildfires

occurred in the more arid Wyoming big-sagebrush habitat type, covered large areas, and were often followed by increases in annual grasses, especially cheatgrass. There is very limited opportunity to restore these areas to their former state and they essentially represent a stable state that will not change without substantial human disturbance intervention. The increase in fine fuel in the form of cheatgrass has made these habitats more prone to fire and increased wildfire frequencies that result in loss of shrubs, especially sagebrush. Sagebrush seed is wind-dispersed and 95% of sagebrush seed is deposited within 30 feet of the parent plant, which largely precludes natural reseeding of large complete burns".

To reduce the likelihood of losing more sage-grouse habitat to wildfire, the Owyhee LWG's plan suggests, among other things, *to develop greenstrips (strips of fire-resistant vegetation planted to slow wildfires) and other fuel breaks* (emphasis added) (2004).

Vegetation Treatments Using Herbicides on BLM lands in the 17 Western States Programmatic Environmental Impact Statement (PEIS, USDI BLM 2007a) - The analysis of proposed herbicide treatments are tiered to the 2007 *Vegetation Treatments Using Herbicides on BLM lands in the 17 Western States Programmatic EIS* (PEIS, USDI BLM 2007a). The ROD for the Final EIS identified herbicide active ingredients that were approved for use on BLM lands and standard operating procedures to use when applying herbicides (USDI BLM 2007b). Only herbicide active ingredients approved for use in the ROD would be utilized. Herbicide treatment activities in the proposed action would follow the applicable standard operating procedures identified in the ROD.

Southwestern Idaho BLM Fire Management Plan - The Southwestern Idaho BLM Fire Management Plan, updated in 2011, provides direction, priorities, and objectives for wildfire, emergency stabilization and rehabilitation, hazardous fuels reduction, and community assistance across the greater southwestern Idaho area. The proposed action is within the Grasmere Fire Management Unit (FMU), which is ranked as high priority for wildfire suppression and emergency stabilization/restoration efforts and moderate priority for hazardous fuels treatments and community assistance, relative to other areas within the Boise District.

In addition to management direction for sage-grouse, the proposed action is also in conformance with other laws and management direction, including cultural resource laws and executive orders, and the Migratory Bird Treaty Act of 1918, as amended, and Executive Order 13186.

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

1979 (AIRFA); National Environmental Policy Act of 1969 (NEPA); 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 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 were never ratified.

Consultation has occurred with the Shoshone-Paiute Tribes. During consultation, the findings of cultural inventories were shared with the Tribes. The Tribes expressed the importance of sage-grouse to their culture and their concern for proper management of sage-grouse and their habitat. The threat of wildfire is a common concern between the Tribes and BLM. They felt the project is worth pursuing and wanted to be updated as progress occurs.

Other tribes with ties to southwestern Idaho include the Bannock and Nez Perce. Southeast Idaho is the homeland of the Northern Shoshone and Bannock Tribes. In 1867, a reservation was established at Fort Hall in southeastern Idaho. The Fort Bridger Treaty of 1868 applies to BLM's relationship with the Shoshone-Bannock Tribes. The northern part of the BLM's Boise District was also inhabited by the Nez Perce Tribe. They signed treaties in 1855, 1863, and 1868. The 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.

The Migratory Bird Treaty Act of 1918, as amended, and Executive Order 13186 - Executive Order 13186 identifies the responsibilities of Federal agencies to protect migratory birds. Federal agencies were ordered to develop a Memorandum of Understanding MOUs with the USFWS. The Order directs that pursuant to its MOU, each agency shall, in harmony with agency missions:

- avoid or minimize, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions;
- restore and enhance the habitat of migratory birds, as practicable;
- prevent or abate the pollution or detrimental alteration of the environment for the benefit of migratory birds, as practicable;
- ensure that environmental analyses of Federal actions required by the NEPA or other established environmental review processes evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of concern.

1.6 Scoping and Development of Issues

Internal and public scoping has been ongoing since the initial scoping package was released in 2008. Several meetings, with staff from the BFO and Boise District Fuels, were held to develop the proposed action and alternatives. Meetings with the U.S. Fish and Wildlife Service (USFWS) and Idaho Department of Fish and Game (IDFG) also occurred.

A scoping package was sent to all interested parties on November 5, 2008. The package provided a general description of the proposed action, design criteria, and map showing the project area's outline. Comments were received from IDFG, Western Watersheds Project (WWP), and the Shoshone-Paiute Tribes. A field tour was conducted to discuss resource issues on May 9, 2009; attendees were IDFG and the Shoshone-Paiute Tribes. A separate field tour was attended by BLM personnel and a representative from WWP on June 26, 2009.

Potential issues from comments include:

- Mowing along roads could enhance palatable vegetation growth that would attract livestock and pose a hazard to motorists. The project is in State of Idaho designated and signed "open range". Motorists and visitors to this area are informed by road-signs and many are accustomed to livestock being near and on the roads, especially dirt roads. Motorists would not be at any more risk in this area than on any road in the Field Office where motorists are responsible for avoiding cattle.

- Fuel break development and maintenance could result in:
  - Expansion of cheatgrass and noxious weeds
  - Impacts to sagebrush obligate species from altered habitat
  - Impacts to sage-grouse including habitat fragmentation, lek disturbance, and habitat loss

- Both IDFG and USFWS indicated that they would prefer to see the implementation of fuel breaks across a smaller area and outside of the area south of Wickahoney Road which is where the greatest number of leks is located. The IDFG does not support the idea that the area south of Wickahoney Road will ever experience a large scale fire (IDFG Letter, 2009, Project Record). The USFWS would like BLM to start small and document the effectiveness of fuel breaks and monitor the control of noxious weeds and invasive annuals. BLM made the following change to the proposed action.
  - The project area was decreased in size and no longer encompasses the entire sage-grouse stronghold area.
  - The project area does not extend south of Wickahoney Road.

- One comment suggested that removing livestock would minimize flammable cheatgrass risk across the landscape.
  - Minimizing cheatgrass risk across the landscape is beyond the scope of this project. The proposed action would alter the vegetative structure and composition of vegetation within the fuel breaks, both native and non-native, and would thereby create strategic locations for safe anchor points across the landscape in the event of fire.

2.0. Description of the Alternatives

Three alternatives have been analyzed in detail: Alternative A – No Action, Alternative B – Proposed Action, and Alternative C – Greenstrip Alternative (Table 3).

Table 3. Miles and roadside acres treated by alternative

Treatment	Alternative A No Action	Alternative B Proposed Action	Alternative C Greenstrip Alternative
Mowing	0	75Miles/909 Acres	0
Maintenance of Existing Greenstrips	0	42 Miles/1,527 Acres	42/1,527 Acres
New Greenstrip	0	11 Miles/ 400 Acres	87 Miles/3,127 Acres
Total Miles/Acres	0	128Miles/2,836 Acres	128 Miles/4,654 Acres

2.1 Alternative A – No Action

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

2.2 Alternative B – Proposed Action –Mowed and Greenstrip Fuel Breaks

BLM proposes to develop and maintain a network of fuel breaks along 128 miles of roadsides in the Bruneau Field Office. Fuel breaks would be established next to roads to augment the road surface effects in reducing fuel continuity. Roads were selected for treatment if vegetation conditions met specific criteria, identified below, and the road's suitability for firefighting and heavy equipment access. Roads identified for treatment were evaluated during fall 2010 and spring 2011. Of 185 miles of roadsides evaluated, 128 miles were identified for treatment (Map 5). Greenstrips would be up to 300 feet wide (i.e., 150 feet on each roadside or 300 feet on one side) along roads; mow strips would be up to 100 feet wide (i.e., 50 feet on each side or 100 feet on one) along roads. Of the 11 miles of greenstrip development only 3 miles have not had sagebrush burned by wildfire.

2.2.1 Mowed Fuel Breaks

The interdisciplinary team identified roads to treat by evaluating vegetation characteristics across the project area. Roads were evaluated against criteria that helped identify where fuel breaks are most needed, and the appropriate treatments necessary to slow wildfire spread and reduce flame lengths. Modifying wildfire behavior both increases the safety margin for firefighters and reduces the number of firefighting resources needed for successful suppression. The criteria, developed by an interdisciplinary team, are identified below.

Criteria to mow roadside vegetation:

> Shrubs taller than 15 inches of moderate density (greater than 20% cover) with a moderate understory (greater than 20% cover) of mid-stature or taller vegetation (greater than 6 inches tall) or with a moderate understory of cheatgrass.

Mowing under this scenario would be followed up with herbicide treatments.

Criteria to not mow roadside vegetation:

> Shrubs less than 15 inches tall or moderate density shrubs greater than 15 inches tall or grasslands with no shrubs.

Goodrich (2005) indicates that the height of low sagebrush is commonly 7.9 to 15.7 inches, so the criterion of targeting sagebrush greater than 15 inches tall would reduce impacts to low sagebrush. Low sagebrush areas were not targeted for treatment because typically these plant communities do not effectively carry fire, resulting in fire slowly burning in "fingers" with lower flame lengths. A moderate density of big sagebrush with adequate herbaceous understory composition effectively carries fire, often resulting in complete combustion of biomass. Reducing sagebrush density and stature, would reduce flame lengths and fire spread rates.

The 128 miles proposed for treatment include 11 miles of greenstrip development, 42 miles of existing greenstrip maintenance, and 75 miles of mowing. The 42 miles of greenstrips, identified for future maintenance, already exist from established seedings or the presence of suitable native vegetation, mostly Sandberg bluegrass.

Mowed fuel breaks would be created using a mower attached to a rubber-tired tractor (Figure 1), and sagebrush would be mowed to a height of 6 to12 inches. Mowing only one side of a road could occur where only one side meets the mowing criteria or if there is a restriction, such as a wilderness boundary or steep slopes. Mowing would be completed when fall weather reduces fire risk. Implementation could occur September through February as long as conditions are appropriate (i.e., soils are not saturated). Dalke and others (1963) indicated that in the Big Desert area of Idaho, male lek attendance begins in March and increases rapidly during the first two weeks of April. Activity restrictions near leks normally begin March 15 at lower elevations in Idaho (Idaho BLM IB 2010-39). Ceasing project implementation before March provides a longer buffer and addresses the Tribes' concerns about sage-grouse congregating on leks before the March 15 deadline that is normally used.

Figure 1. Rubber-wheeled tractor and roto-mower establishing a fuel break on the Idaho Falls District.

Maintenance mowing would occur once sagebrush has re-grown to an average height greater than 15 inches. Mow strips that show the establishment or proliferation of annual grasses (e.g. cheatgrass) will be treated with the appropriate herbicide as needed. These mow strips would be monitored annually, for the first 3 to 5 years following treatment, and re-treated as necessary to maintain suitable vegetative conditions in the fuel breaks.

2.2.2 Greenstrips

Greenstrip fuel breaks consist of low-growing, fire-resistant vegetation that alters fire behavior by reducing flame lengths and fire intensity. A total of 53 miles of greenstrips are proposed including 42 miles of roadside which have been identified as currently supporting suitable greenstrip vegetation (existing greenstrips) and 11 miles of roadside where greenstrips would need to be developed.

The existing 42 miles of greenstrip would be enhanced and maintained as necessary by seeding desirable species and application of herbicide to control unsuitable greenstrip vegetation from establishing. Of the 11 miles of greenstrip to be developed, 3 of those miles are in an area where cheatgrass is mostly north of the existing road and could gain greater dominance on the southern side of the road if a fire burns the area. The 3 miles would require removing some scattered sagebrush, but no more than 20 total acres. Existing vegetation would be removed by prescribed fire, plowing, mowing or a combination of methods. The other 8 miles of proposed greenstrips are within the 2011 Big Hill Fire perimeter; negligible sagebrush loss would result. Greenstrips would be developed using a rangeland drill for seeding, and herbicide treatment. Maintenance of greenstrips could include re-seeding, herbicide application or a combination of both.

Native species would be emphasized for seeding per IM 2010-149, Sage-grouse Conservation Related to Wildfire and Fuels Management; however, certain non-native species or cultivars may be better suited to compete with invasive annuals. Preferred greenstrip species would be low stature plants, that remain green late into fire season, and would be appropriate for the ecological site. Seeding would be accomplished using a standard rangeland drill. Follow-up herbicide treatments would occur as necessary to maintain the integrity of established greenstrips.

Vegetation selected for seeding greenstrips would consist of a combination of bluegrass and fescue species, squirreltail, inland saltgrass, and other low-statured grasses that are determined to be effective greenstrip species and appropriate for the ecological sites. Forage kochia would be used where competition from annual grasses is high and grass species would have difficulty becoming established. Forage kochia would not be seeded within 0.5 miles of playas supporting Davis' pepperweed (*Lepidium davisii*), an Idaho BLM Sensitive Species that inhabits these playas. Areas currently supporting crested wheatgrass within greenstrip areas could be re-seeded with greenstrip vegetation. Areas where vegetation consists mostly of Sandberg bluegrass would be maintained and enhanced by treating cheatgrass with an appropriate herbicide.

Areas excluded from treatment include a 100-foot buffer adjacent to playas, wet meadows, and riparian greenline areas, 50-foot buffer from occupied pygmy rabbit burrows, unevaluated or significant archeological sites in proposed greenstrips only, or any area that does not meet the above mowing criteria. Map 5 shows locations of proposed greenstrips.

Livestock use would be restricted from greenstrips until the seeded vegetation becomes established. Livestock grazing would be controlled through deferred use, construction of temporary fencing or salting and watering in a disturbed site at least 0.5 miles away from developing greenstrips.

Greenstrips would be monitored annually for weeds and seeding success, and re-treated, as necessary, until the desired greenstrip vegetation becomes established. Once desired vegetation is established, monitoring would occur on a 3-year cycle to determine maintenance needs.

2.2.3 Herbicide Treatment

Chemical treatment involves the application of herbicides at specific plant growth stages to suppress or kill targeted plant species. Herbicides would be used to augment the establishment of greenstrip vegetation by reducing competition with undesirable species, and to reduce the presence of invasive annuals in order to maintain the effectiveness of both mow and greenstrip treatment areas.

The BLM completed an analysis for use of herbicides on public lands managed by the BLM in the Programmatic Environmental Impact Statement, *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* (PEIS) (USDI BLM 2007a). The analysis for use of herbicides for the fuel breaks proposed in this EA is tiered to the PEIS. The herbicides proposed for use in this EA were analyzed in the PEIS and selected for use in ROD. The relevant standard operating procedures identified in the ROD are included in appendix section 7.5 of this EA.

Only ground-based application methods would be employed. Herbicides proposed for use are presented in Table 4. Herbicides would be applied according to label recommendations and the standard operating procedures in the PEIS.

Herbicides would be applied to the 11 miles (400 acres) of new greenstrips proposed. Herbicide use may or may not occur along the entire fuel break network; however, for the analysis BLM assumes herbicides would be applied to the entire 128 miles (2,836 acres) although the actual

miles treated may be much less. Treatments during the life of the project would be completed as needed to maintain the effectiveness of fuel breaks.

Table 4. 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.
Tebuthiuron	Relatively non-selective soil activated herbicide; pre and post-emergent control of annual and perennial grasses, broadleaf weeds and shrubs.
Triclopyr	Growth regulator; broadleaf weeds and woody plants.

*Information compiled from (USDI BLM 2007a).

Standard Operating Procedures/Design Criteria for Alternative B (Proposed Action)

Recreation/Wilderness

- No mowing would occur along any designated Scenic Byway route.
- No mowing would occur on roads that are bordered on both sides by wilderness.
- In areas where a road borders wilderness on one side, no mowing would occur on the wilderness side, but mowing could occur on the opposite roadside.

Habitat Protection

- No mowing or drill seeding would occur when soils are saturated and easily rutted.
- No mowing or greenstripping would occur within the wetland or riparian zones' greenline (area where riparian vegetation species exist).
- Mowing and seeding equipment, including vehicles and trailers, would be washed, prior to implementation, to reduce the potential for weed spread.
- Any noxious weed populations would be treated prior to fuel break development or avoided to reduce the chance of spread.
- Proposed routes would be surveyed for special status plants; any populations would be avoided.
- Mowing would not occur within 100 feet of playas, to protect the integrity of playas for Davis' pepperweed habitat. Greenstrips within 0.5 miles of playas would not be seeded with forage kochia to protect habitat from encroachment.

Wildlife Protection

- From March 1 through July 31 treatments would be limited to actions and areas where impacts to sage-grouse reproduction including lek attendance, nesting, and early brood rearing would not occur (i.e., spot weed treatments, greenstrip seeding).
- Any temporary fence constructed would be at least 1.25 miles away from active leks and marked in accordance with current marking specifications identified in IM No. ID-100-2011-001 and guidelines specified in BLM IM 2012-043 to reduce collisions by sage-grouse and impacts to other wildlife species.
- From March 1 through July 31 treatments would be limited to actions and areas where effects nesting migratory landbirds would not occur (i.e., no sagebrush mowing would occur)
- No fuel break development would occur within 50 feet of occupied pygmy rabbit burrows (Wilson et al. 2011).
- Potential and occupied pygmy rabbit habitat would be surveyed one week prior to mowing treatment to identify new burrows.
- No use of 2,4-D within ¼ mile of pygmy rabbit habitat.
- No application of herbicides (not including 2,4D) above the typical application rate would occur within 100 yards of active burrows from one hour before sunset to one hour after sunrise, to minimize the chance of direct contamination.
- Application of herbicides other than 2,4D would be applied using a backpack sprayer within 100 yards of active burrows.

Noxious Weed and Cheatgrass Control, Fuel Break Maintenance

- Herbicide use would be in accordance with the relevant standard operating procedures identified in the *Record of Decision for the Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* (USDI BLM 2007b).
- Herbicide would be applied using a truck, tractor or ATV mounted sprayer, depending on the treatment zone's width. 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.
- No use of 2,4-D within ¼ mile of pygmy rabbit habitat.
- No application of herbicides (not including 2,4D) above the typical application rate would occur within 100 yards of active burrows from one hour before sunset to one hour after sunrise, to minimize the chance of direct contamination.
- Application of herbicides other than 2,4D would be applied using a backpack sprayer within 100 yards of active burrows.

Livestock Management

- To reduce disturbance while greenstrips become established, temporary livestock watering and salting may be established in a disturbed site or livestock would be moved to areas with existing watering sites at least 0.5 mile away from newly seeded areas.
- Temporary watering sites would have appropriate clearances completed prior to development. If a cultural site or special status species is discovered during the completion of clearances, consultation with the appropriate agency would be completed prior to a temporary water site being established. Temporary water sites would be developed by moving existing watering materials from other sites within the allotment.

- An effort would be made to develop greenstrips during any planned deferred/rotational grazing schedules, where practical.
- If grazing deferment cannot be scheduled into the seeding plan, then temporary fencing may be installed to protect the seeding until objectives have been met.
- Livestock trailing on routes in or adjacent to vegetation treatments (e.g., fuels projects or restoration treatments) will be kept on the route [1] until the treatment objectives are met, unless the specific trailing event would not conflict with treatment objectives.

Cultural Resources

- Project areas, which include greenstrips, temporary fences or placement of salt blocks and water troughs, would have the appropriate cultural resource inventories completed prior to project implementation. If National Register-eligible or unevaluated cultural sites are discovered, consultation with SHPO would be completed prior to initiation of any work that could potentially degrade the site.
- If cultural resources are discovered during project implementation, activities shall cease in the discovery area, and the Project Coordinator or Authorized Officer shall be notified immediately (NOTE: This is a standard statement for inadvertent discovery.)
- Pursuant to 43 Code of Federal Regulations (CFR) 10.4 (g), the Authorized Officer must be notified, by telephone, with written confirmation, immediately upon the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony. Further, pursuant to 43 CFR 10.4 (c) and (d), all activities must stop in the immediate discovery vicinity and protected for 30 days or until notified to proceed by the Authorized Officer.

2.3 Alternative C – Greenstrip Fuel Breaks Only

Under this alternative, BLM would develop and maintain a network of greenstrip fuel breaks along approximately 128 miles of road. Decreased fuel, shorter plant height, and higher fuel moisture content of the plants growing in the greenstrip will rapidly slow a fire when it encounters a greenstrip (St. John and Ogle 2009). The same 128 miles of roads identified for treatment in the Proposed Action would be treated, but all roadsides would have greenstrips and no mowing would occur (Map 6. Alternative C). There would be 87 miles of new greenstrips developed and 42 miles of existing greenstrips maintained. Greenstrips 300 feet wide (150 feet on each side or 300 feet on one) along 87 miles of road would be created by removing existing roadside vegetation and then planting fire resistant vegetation. Existing vegetation would be removed by prescribed fire, plowing, mowing or a combination of methods. Treatment using BLM-approved herbicides would be applied where invasive annuals are a major component of the vegetation. Greenstrips would be seeded with suitable fuel break species appropriate for the ecological site, and would be re-seeded if necessary. Greenstrips within 0.5 miles of playas would not be seeded with forage kochia to protect Davis' pepperweed habitat from encroachment.

Greenstrips would be monitored annually for establishment, weeds, and invasive plants, and re-treated, as necessary, until the desired vegetation becomes established. Once established,

[1] Keep on route" indicates livestock should be actively herded to stay on the route; any strays are to be kept to within 50 feet of the route.

monitoring would occur on a 3-year cycle to determine maintenance needs. In some areas, temporary fencing or temporary changes to grazing management may be required to protect greenstrips from livestock until the vegetation becomes established.

Areas excluded from greenstrip treatments include wet meadows, riparian greenlines, unevaluated or significant archaeological sites, occupied pygmy rabbit sites, sage-grouse leks, and a 100-foot buffer around playas.

2.3.1 Herbicide Treatment

Herbicides would be used to reduce competition with undesirable fuel break vegetation, augmenting the establishment of suitable greenstrip vegetation. Follow-up treatments would be completed as needed to maintain the effectiveness of greenstrips by controlling establishment of unsuitable fuel break vegetation.

The herbicides proposed for use are identified in Table 4. Application of herbicides would be completed according to the standard operating procedures presented in *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* (USDI BLM 2007b), which are included at Section 7.5 of this EA. Only ground-based application methods would be employed.

Application of herbicides may occur throughout the entire network of fuels breaks. For this analysis, BLM assumed that the entire 128 miles would be treated with herbicides even though the actual miles treated may be much less. The total amount of acres that could be treated is 5,066, which is 2,013 acres more than Alternative B. Treatments during the life of the project would be completed as needed to maintain the effectiveness of established fuel breaks.

Standard Operating Procedures/Design Criteria (Alternative C)

These are the same as those identified for Alternative B in Section 2.2.3.

2.4 Monitoring and Evaluation

Monitoring would be implemented to measure progress towards meeting objectives during and after implementation of either action alternative (B or C). Monitoring practices are divided into two categories:

- Implementation Monitoring: Done frequently to determine adherence to project criteria
- Effectiveness Monitoring: Allows resource condition comparisons between years to determine trends and whether progress is being made towards long-term objectives

Implementation monitoring would occur during and following all phases, and would be conducted by the project inspector to ensure that the project was implemented as prescribed.

Effectiveness monitoring would be conducted on transects in treated and untreated control areas. Data would be collected before and after treatment to determine success, and identify if additional treatments would be necessary to meet project objectives. Greenstrips would be monitored to identify if seeded vegetation is spreading from designated greenstrip areas. The

Monitoring Plan, Section 7.2, contains monitoring details including protocol, timelines, and how results are measured and evaluated.

Additional monitoring would occur to document and evaluate fuel break effectiveness during fire suppression and by means of interviews with fire personnel and post-fire site evaluation. The fuel break monitoring data sheet can be viewed in appendix 7.2.

2.5 Alternatives Considered but Eliminated from Detailed Study

Five alternatives were considered during the planning/development process, but not analyzed in detail because they did not achieve the purpose and need for action. These included prescribed fire, mowing interior areas away from roads (not along roadsides), mowing only in Wyoming big sagebrush communities, intensive livestock grazing, and building a guard station.

Prescribed burning of roadside fuel breaks was discussed early in the alternative development process. Prescribed burning was eliminated from detailed study because the logistics, costs, and timing to conduct prescribed burns at the scale needed, would be short, increasing the potential for not meeting the purpose and need. Because the costs, logistical demands, and personnel needs would be much greater for a prescribed burn when compared to mechanical or chemical treatment alternatives this alternative is not feasible.

Mowing interior away from roads would have consisted of leaving 100-200 yards of vegetation adjacent to roadsides and mow strips would have been developed at least 100 yards from a roadside. This would reduce visual impacts of mowing immediately adjacent to roadsides and reduce associated roadside weed issues. However, roadways are already disturbed, and increasing the disturbance area by 150 feet on each side was less of a visual impact than going farther away and mowing areas un-impacted by roads. Weeds commonly occur along roadsides because they are easily spread by vehicles. If weeds were introduced farther from roads, they may not be detected as readily as along roads. Part of the fuel breaks' effectiveness, along roads, is the roadway's bare soil, so interior mowing would not meet the purpose of reducing fires burning across existing roadways. Additionally, options for engaging wildfires and firefighter safety would not be increased, per the project's purpose and need.

Mowing only in Wyoming big sagebrush communities was considered, but not analyzed in detail. While the mowed areas would provide greater safety for firefighters and increase fire suppression options, it would not protect areas with sage-grouse habitat and highest numbers of sage-grouse.

Intensive grazing was considered to limit the amount of grass along roadways. Grazing would not effectively trim roadside sagebrush height to reduce flame lengths and the risk of fire spread across roads. The level of grazing would lead to degraded soil conditions and erosion. Additionally, the required 128 miles of fencing necessary to graze a strip along roads would degrade wildlife habitat to an unacceptable level.

New Guard Station near Grasmere was suggested as a way to decrease firefighter response time to sage-grouse habitat, thereby increasing the likelihood of containment before large tracts of habitat are consumed. Given that suppression priorities are life, property, and then resources,

the existence of a guard station would not guarantee that the surrounding area and preliminary priority sage-grouse habitat would be a first response priority.

Treatment of Roads South of Wickahoney Road was initially proposed but was not supported by the IDFG and USFWS. BLM therefore altered the original project area to respond to IDFG and USFWS comments.

3.0. Affected Environment, Environmental Consequences, and Cumulative Impacts

The following elements of the human environment are either not present in the project area, or would not be affected by enacting either alternative; therefore, they will not be addressed further in this document. They are: wild and scenic rivers, wilderness, areas of critical environmental concern, minority or economically depressed populations, farmlands, floodplains, water quality, wetlands and riparian zones, air quality, paleontology, adverse energy impacts, and hazardous materials.

Areas designated as Wilderness do occur in proximity to the project area; however, no treatments would occur in these areas.

This section provides an evaluation of the baseline condition of elements of the human environment potentially affected by the alternatives. The evaluation is a description of the elements' current condition, consequences or expected implementation effects of each alternative, as well as potential effects of not developing and maintaining a network of fuel breaks.

Analyses of cumulative impacts and their scope for each resource are also presented. Cumulative effects describe incremental impacts of the alternatives when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes them (40 CFR 1508.7).

Actions that have occurred in the past and will continue into the foreseeable future include:

1. Livestock grazing and trailing – Livestock grazing and trailing has occurred for more than a century, and is expected to continue into the foreseeable future. Rangeland Health Assessments and subsequent determinations on meeting rangeland standards are scheduled for Sheep Creek and Riddle allotments in the near future. Based on those determinations, management direction in the permits may be modified to ensure conditions achieve applicable standards. Grazing allotments in the project area are required to meet or make progress towards meeting the Standards for Rangeland Health. The process of trailing livestock occurs when livestock are moved from one location to another by herding, often using horses or motorized vehicles. In the project area, trailing may occur within 50 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. Trailing would follow stipulations identified in the Trailing EA (Environmental Assessment DOI-BLM-ID-B010-2012-0003-EA).
2. Military training – The area is under airspace used by the U.S. military for training purposes. Operations often include high speed flights causing sonic booms and low levels flights by loud fighter jets. This type of training has occurred for decades and some wildlife species

may have adapted to the aircraft sounds and presence. When disturbance does occur, it is of short duration. Military vehicles are used on a minimal basis in the project area and vehicles stay on roads.

3. Noxious weed treatment – The project area is within the Eastern Owyhee Cooperative Weed Management Area (CWMA). The BLM and its cooperators have been working together to identify, monitor, and treat noxious weeds for several years. This cooperative is expected to continue into the foreseeable future. Weed treatments consist of mechanical, biological, and chemical methods as described in the Noxious and Invasive Weed Treatment EA (Boise District and Jarbidge Field Offices EA #ID-100-2005-EA-265).
4. Power line maintenance – The power line adjacent to State Highway 51 was established in 2008, and is considered as part of the existing condition. Maintenance includes occasional power line work and spraying chemicals to inhibit vegetation growth at the base of power poles to protect them in the event of wildfire. The effects from power line maintenance are limited because the power line is adjacent to the highway.
5. Northwest pipeline – This gas pipeline crosses through the western portion of the project area. There is minimal maintenance required on this structure. The likelihood of cumulative effects associated with pipeline maintenance and any alternative is minimal and these actions will not be analyzed further.
6. Recreation – Several forms of dispersed recreation are popular throughout the project area, including camping, hiking, driving, hunting, biking, birding, off-highway vehicle riding (OHV), and shooting. Most recreation occurs in the fall during annual hunting seasons for pronghorn antelope, elk, deer, chukar, and sage-grouse. For most resources, there would be no cumulative recreation effects.

3.1 Fuels and Fire Behavior

3.1.1 Affected Environment

The National Wildfire Coordination Group (NWCG) (2011) defines a fuel break as "[a] natural or manmade change in fuel characteristics which affects fire behavior so that wildfires burning into them can be more readily controlled." The group also defines a fuel break system as "[a] series of modified strips or blocks tied together to form continuous strategically located fuel breaks around land units." Creating fuel breaks by either mowing or greenstripping along roadsides alters the structure, composition, and continuity of vegetation within the strips from either a predominantly shrub dominated overstory or annual grass dominated overstory to a perennial bunchgrass overstory. This change in vegetation structure, composition, and continuity has meaningful effects on fire behavior as a wildfire front enters and burns in these strips.

Under typical summer weather conditions in the Boise District, wildfires burning in big sagebrush stands can be described as exhibiting moderate to high intensity, and high rates of spread compared to other vegetation communities. Wildfires in annual grassland can be described as having very high intensities and rates of spread compared to other vegetation communities. Wildfires burning in short perennial bunchgrass stands, on the other hand, have much lower intensity and rates of spread compared to either big sagebrush or annual grassland stands.

A fuel model is a description or set of measurements that define properties for vegetation communities with similar fuel bed characteristics. These measurements are used by fire

managers as inputs to mathematical models for wildfire behavior potential. Specifically, the Rothermel (1972) fire spread model is the core algorithm in fire behavior software programs such as BEHAVE (Burgan and Rothermel 1984), BehavePlus (Andrews et al. 2003), and FARSITE (Finney 1998). These programs have been widely used for years by fire managers during wildfire incidents and to plan prescribed fires. In 2005, a set of 40 standardized fuel models were released for use in fire behavior and fire effects modeling (Scott and Burgan 2005). Prior to then, fire managers had a set of 13 standard fuel models to choose from when calculating potential fire behavior (Rothermel 1972, Albini 1976, Anderson 1982). Based on local fuel load measurements and firefighter observation, the three standard fuel models that best represent fuel bed characteristics for the project include: Grass Shrub 2 (GS2) (for big sagebrush); Grass 1 (GR1) for perennial bunchgrass; and Grass 4 (GR4) for cheatgrass. Figures 2 and 3 display expected flame lengths (feet) and rate of spread (chains/hour, see glossary) of wildfires burning in GS2, GR1, and GR4 fuel models on a 0% slope, under varying mid-flame wind speeds, and low summer fuel moisture conditions.

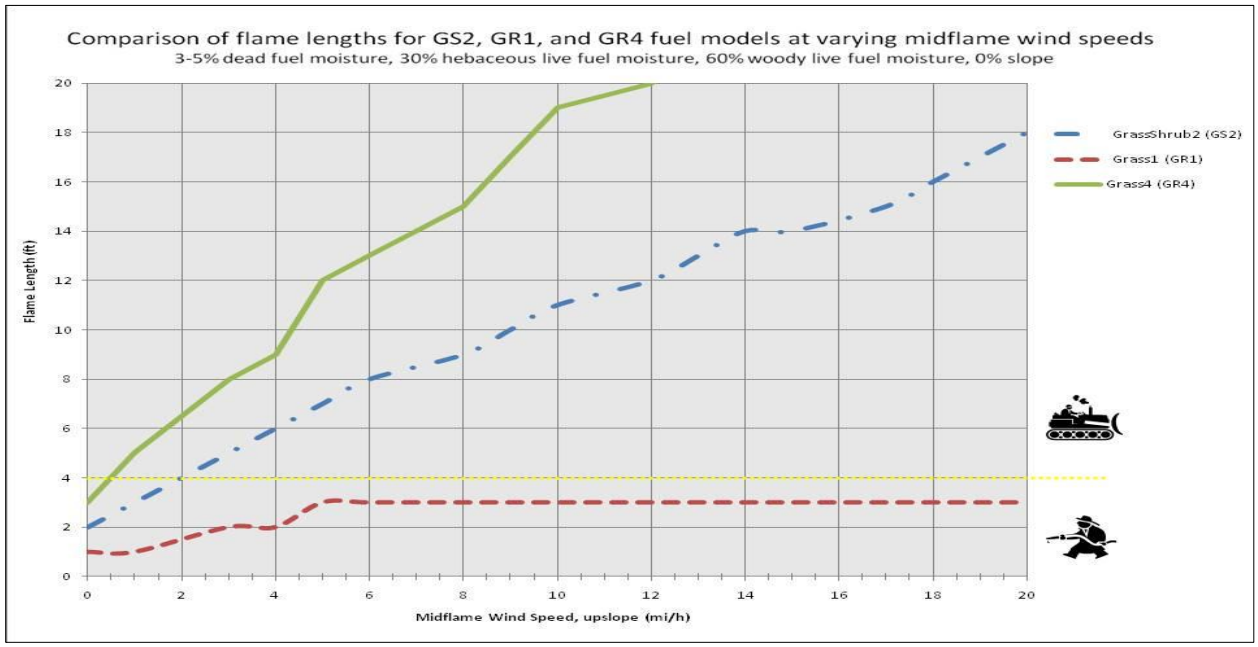


Figure 2. Comparison of flame lengths by fuel models

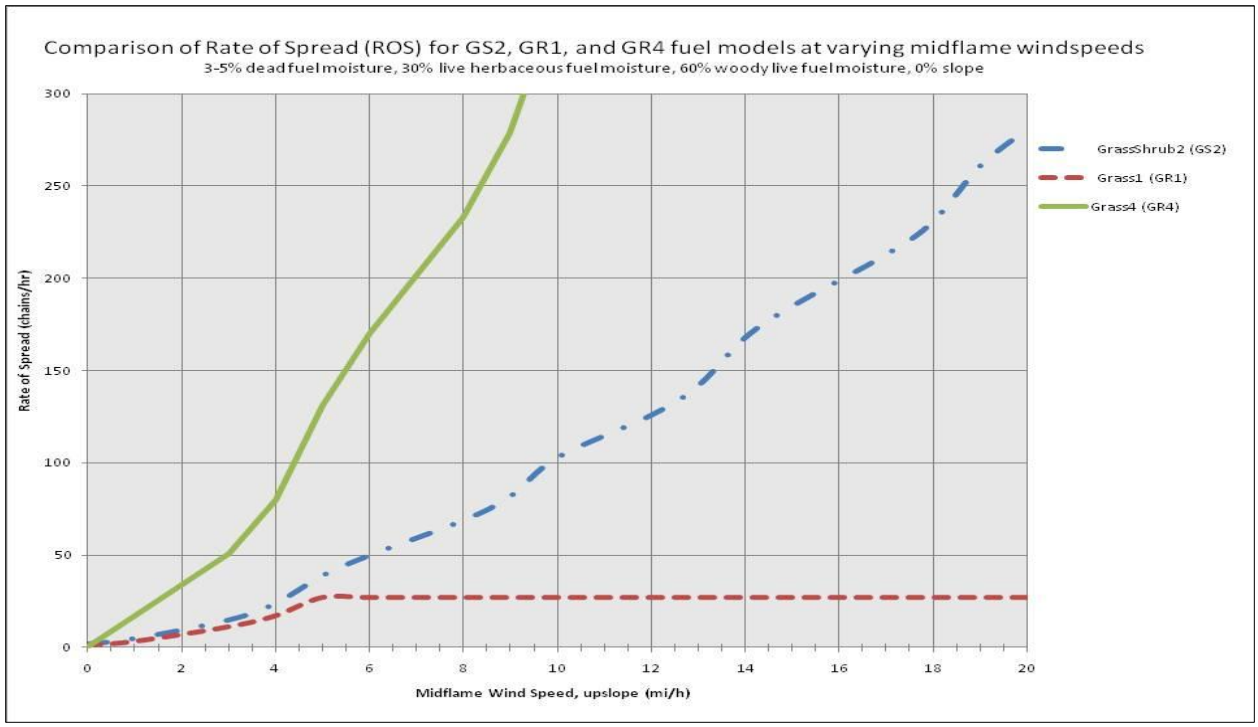


Figure 3. Rate of wildfire spread by wind speed and fuel model

As mid-flame wind speed increases from 0 to 5 miles per hour, flame length in GR1 increases up to three feet and then levels off even as mid-flame wind speed continues to increase. Flame length in GS2 and GR4, on the other hand, continues to increase incrementally as mid-flame wind speed increases. Similarly, rate of spread in GR1 increases as mid-flame wind speed increases up to six miles per hour and then levels off, moving at a rate of 25 chains per hour. Rate of spread in GS2 and GR4 continues to increase incrementally as mid-flame wind speed increases.

Wildfires burning in big sagebrush stands during dry, hot, and windy conditions with live woody fuel moistures below 75% can be expected to consume large acreages in a very short time. Generally, wildfires with flame lengths of four feet or less can be fought directly by people with handtools, whereas fires with flame lengths greater than four feet are too intense and require indirect attack suppression, utilizing heavy equipment like fire engines, bulldozers, and retardant aircraft.

Sustained wind speeds during a passing summer thunderstorm often exceed 30 miles per hour, and can change directions quickly. As the wildfire burns across changing topography, flame lengths in big sagebrush stands can be expected to exceed the 18 feet displayed in Figure 2. In addition, wind driven fires often carry burning embers which can ignite vegetation in advance of a flaming front. For these reasons, mow strips or greenstrips along roadways should not be viewed as "fire stoppers", but rather as a proactive measure taken to provide firefighters more options to safely engage wildfires when they occur.

Indirect attack of a fast moving wildfire often involves the ignition of a backburn, starting from an anchor point and continuing along existing roads well ahead of the flaming front. This, in

essence, substantially widens the road by eliminating the fuel that normally would feed an advancing fire. Roads chosen for this kind of tactic ideally need to be readily accessible to heavy 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/or widen existing fuel breaks.

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. A network of effective fuel breaks along roadsides can mean the difference between being able to contain and control a wildfire at a few thousands of acres as opposed to tens of thousands, **especially** when only limited firefighting resources are available. To illustrate this point, a synopsis of the Crowbar Fire, which burned 29,500+ acres in 2010 at the project area's north end, is described below.

Crowbar Fire Synopsis - On August 5, 2010, multiple thunderstorms ignited three wildfires while passing over the Boise District. One, named the Crowbar Fire, would burn 29,508 acres in the northern portion of the BFO before being controlled. It burned through some of the last remaining stands of big sagebrush present in this area, as well as old seedings and annual grassland. A red flag warning, indicating high fire danger, was in effect until 9:00 pm that day due to scattered thunderstorms. Predicted weather conditions were optimum for rapid wildfire growth with maximum temperatures between 90 and 99° F, minimum relative humidity between 9% and 19%, sustained winds around 10 mph, and a Haines Index (potential for rapid fire growth) rating of 6 High. An ignition in the center of the BFO, the Pot Fire, was reported to dispatch at 4:22 pm, one hour before the Crowbar Fire was detected. The Pot Fire was considered high priority because it was burning in intact key sage grouse habitat. Initial dispatch consisted of four Type 4 fire engines, one bulldozer, one helicopter, one water tender, one heavy air tanker, and available fixed wing aircraft. A smoke column to the east of the Pot Fire was detected as firefighters were responding, and a Battalion Chief diverted to take a look.

Upon arrival at the smoke column, the Battalion Chief called Boise District Duty Officer requesting diversion of the dispatched bulldozer and heavy air tanker. The fire at 6:17 pm was estimated to be 200+ acres and running. The bulldozer and heavy air tanker were diverted to the Crowbar Fire, but these would be the only firefighting resources received for almost two hours, despite requests, due to multiple ignitions and active wildfires burning across southwestern Idaho. When four fire engines did arrive, access around much of the fire was difficult due to sandy soil and topography, so indirect attack suppression was utilized.

A backburn operation was attempted off the CCC Road, but soon abandoned due to heavy brush on both sides, and firefighters could not safely ignite and keep fire to one side of the road (Figure 4). At 7:18 pm, it was estimated to be 600+ acres. The fire burned across Broken Wagon Flat Road to the south at 8:40 pm, keeping the limited firefighting resources busy. A second bulldozer and two more fire engines arrived on the fire between 9:30 and 10:30 pm, and a big backburn operation located off State Highway 51 was planned. Firefighters were successful in completing the backburn while the two bulldozers flanked the north side of the fire, tying into State Highway 51 at 2:27am the next morning. The wildfire was effectively stopped by the backburn operation, but not until it had burned almost 30,000 acres (Figure 4). Fire engines and

helicopters continued to address hotspots within the fire's perimeter throughout the next day; the fire was called controlled on August 7, 2010.

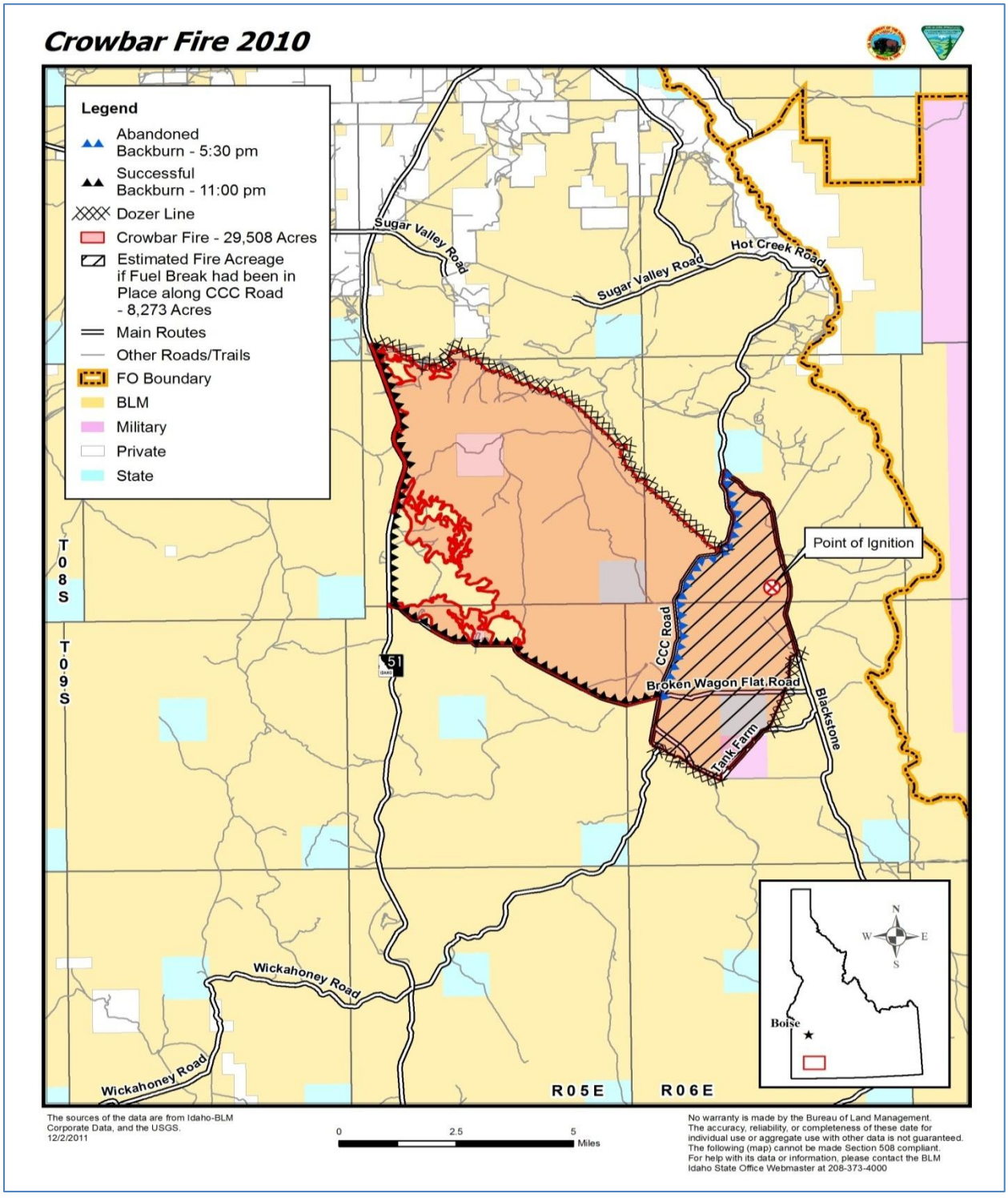


Figure 4. Illustration of events and acres burned in the Crowbar Fire 2010

3.1.2 Environmental Consequences

3.1.2.1 Alternative A

The No Action alternative would not have a network of placed fuel breaks across the project area. Opportunities for firefighters to safely engage wildfires using indirect attack suppression tactics, such as backburns, would be limited, for the most part, to major highways and crowned and ditched roads (e.g. county roads). Wildfires, like the 2010 Crowbar Fire, would continue to burn across large acreages during hot, dry, and windy summer days when firefighting resources are limited from multiple ignitions following thunderstorms. The number of future acres burned during wildfires in the project area, over the next year, decade or century, is difficult to estimate because the causal factors of fire, location of lightning caused ignitions, and availability of suppression resources are dynamic and, in some cases, unknown. These causal factors include weather and climate in response to increases in global warming, fine fuel loads, increases and/or decreases in non-native plant species, changes in resource management, and future agricultural and/or urban development and infrastructure. Herbicide treatments to maintain fuel break effectiveness would not occur, and could result in unsafe conditions if firefighters expect the existing fuel breaks to be functioning.

3.1.2.2 Alternative B

The Proposed Action would result in a network of fuel breaks (both mowed and greenstrips) across the project area. Opportunities for firefighters to safely engage wildfires using tactics such as backburns would be increased, and acres burned over time would likely be reduced. The probability of controlling a wildfire, in a remote region during extreme summer weather conditions and when firefighting resources are scarce due to multiple ignitions, would be increased over Alternative A.

The Battalion Chief/Incident Commander of the 2010 Crowbar Fire stated he is confident that had a 50-foot mowed, vegetation strip along both sides of the CCC Road been in place prior to the fire, efforts to conduct the original backburn early in the initial attack would have been successful (T. Floyd, personal communication, 2011). Given this predicted successful backburn operation, the Crowbar Fire would have been controlled at approximately 8,200 acres, instead of the 29,508 acres it consumed. The wildfire conditions and availability of fire suppression resources exhibited on the Crowbar Fire were not unique. Many historic wildfires in the sagebrush steppe of the BFO and across the Boise District have had similar circumstances, where multiple ignitions were started by passing thunderstorms and suppression resources were spread thin, creating optimum conditions for larger acreage fires.

The use of herbicides to maintain desired vegetation within the fuel breaks would ensure the effectiveness and functionality of the fuel breaks and improve firefighter safety while utilizing the fuel breaks as anchor points.

3.1.2.3 Alternative C

Alternative C would result in a network of strategically placed greenstrips across the project area. Wildfire intensity and rate of spread would decrease as it entered these strips and, in some cases, would extinguish before reaching the other side because of the greenstrip width (300 feet plus the road),. In addition, opportunities to safely engage wildfires using indirect tactics, such

as backburns, would be increased and acres burned over time would likely be reduced. The probability of controlling a wildfire, in a remote region during extreme summer weather conditions and when firefighting resources are scarce due to multiple ignitions, would be substantially increased compared to Alternative A. Because greenstrips could be composed of forage kochia (a shrub that stays green throughout the fire season and excludes grasses and forbs within shrub interspaces over time) and wide enough to potentially extinguish wildfires without suppression, the number of future acres burned under this alternative would likely be fewer than acres burned under the Proposed Action (Alternative B). However, because causal factors of wildfire, availability of fire suppression resources, and location of natural fire ignitions are dynamic, the number of acres spared from future wildfire compared to Alternative B is unknown.

Effects of herbicide use would be the same as those described for Alternative B.

3.1.3 Cumulative Impacts

The fuels and fire behavior scope of analysis for Cumulative Impacts includes all lands within the project area boundary and grazing allotments immediately adjacent to the project area for as long as established fuel breaks are maintained. This scope is appropriate because the proposed fuel breaks would increase the likelihood of reducing wildland fire size in and immediately adjacent to the project area but not necessarily any larger an area.

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 fenceline 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 either mowed strips and/or 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.

3.2 Vegetation, including Noxious Weeds and Special Status Species

3.2.1 Affected Environment

General Vegetation **–** Plant communities in the project area are characterized by soil type and disturbance. Approximately 165,000 acres have burned in wildfires since the late 1950s. These fires occurred mostly in the project area's eastern half where characteristic vegetation is composed of Wyoming big sagebrush and salt-desert shrubs. The majority of these acres were seeded post-fire and are typically composed of crested wheatgrass with various stages of re-establishment of sagebrush, rabbitbrush or salt-desert shrub, and various levels of invasion by non-native annual grasses and forbs. Ecological site descriptions (ESDs), developed by the U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS), describe the typical plant community expected to occur on a site, based on soil parent material, climate, living organisms, topography or landscape position, and time (USDA-NRCS, 1997). Due to the large size of the project area and fluctuation in annual plants, it is difficult to accurately ascertain how much has been invaded by non-native annual grasses and forbs or what level of invasion has occurred. Therefore, the ESDs are used to describe the potential vegetation where no large scale disturbances, such as fire or post-fire seeding, have altered the vegetation type.

The soils in the north and east lower elevation areas developed from historic lakebed sediment, and tend to be high in calcium and sodium salts. The ecological sites representative of these soils are the Silty and Calcareous Loam 7"-10" with salt desert shrub plant communities dominated by shadscale (*Atriplex confertifolia*), bud sagebrush (*Picrothamnus desertorum*), winterfat (*Krascheninnikovia lanata*), and horsebrush (*Tetrademia* sp.) with Indian ricegrass (*Achnatherum hymenoides*), Thurber needlegrass (*Achnatherum thurberianum*), bottlebrush squirreltail (*Elymus elymoides*), and Sandberg bluegrass (*Poa secunda*). Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) also occurs in these ecological sites, but is not typically a dominant plant. Approximately 81,000 acres in the project area are classified as these ecological sites.

The mid-elevation area runs diagonally from the northwest trending southeast through the project area. The major ecological site descriptions include Loamy 8"-12" and 10"-13" dominated by Wyoming big sagebrush with bluebunch wheatgrass (*Pseudoroegneria spicata*) and Thurber needlegrass in the understory. Also in this mid-elevation zone are areas of Very Shallow Stony 8"-12" with a black sagebrush (*Artemisia nova*) dominated plant community. Approximately 251,000 acres in the project area are classified as these sites.

The higher elevation occurs in the southwestern third of the project area. The dominant ecological sites in this zone are Loamy 12"-16", Shallow Claypan 12"-16", and Clayey 12"-16". The plant communities associated with the Loamy sites are dominated by mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) with bluebunch wheatgrass and Idaho fescue (*Festuca idahoensis*). The plant community associated with Shallow Claypan and Clayey sites is low sagebrush (*Artemisia arbuscula*) with Idaho fescue. Approximately 90,100 acres are classified as these sites.

Cheatgrass (*Bromus tectorum*), an invasive non-native annual grass, has become established in low to mid elevation plant communities in the central and eastern portions of the project area. With the moderate temperatures there, cheatgrass is able to germinate in the fall, overwinter, and emerge in the spring with an established root system. This growth habit allows cheatgrass to take advantage of available early spring moisture, giving it a jump start on the growing season. Following disturbance, such as fire or heavy livestock grazing, plant communities experience an increase in annual grasses and forbs, sometimes becoming the dominant species. Conditions in the higher elevations reduce the risk of cheatgrass dominance, where it must complete a full lifecycle during a spring/summer period. In the higher elevations, cheatgrass may still become a dominant species; however the current native communities provide adequate competition to preclude this from occurring.

Where seeding treatments have been moderately successful following wildfires, the plant communities are typically a mix of crested and Siberian wheatgrass with existing native perennial grasses and sagebrush. Other plant species that have been seeded are Russian wildrye, sand dropseed, and forage kochia. Based on satellite imagery interpretations from 2005, roughly 44,000 acres in the project area are characterized as seedings; this acreage has increased since 2005 as a result of emergency stabilization and rehabilitation treatments following wildfires.

Noxious weeds – Within or immediately adjacent to the project area, the following noxious weeds have been treated: salt cedar or tamarisk (*Tamarix spp*.), Scotch thistle (*Onopordum acanthium*), Canada thistle (*Cirsium arvense*), whitetop (*Cardaria draba*), diffuse knapweed (*Centaurea diffusa*), Rush skeletonweed (*Chondrilla juncea*), and spotted knapweed (*Centaurea*

maculosa). 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 uninfested areas following disturbances that alter soil stability or plant community diversity.

Special Status Species - There are no known populations of Federally Listed Proposed, Threatened, or Endangered (BLM Type 1) plant species in the project area. However, approximately 3,000 – 4,000 acres in the area's extreme northeastern portion has been preliminarily identified as potential habitat for slickspot peppergrass (*Lepidium papilliferum*), based on soil information. Slickspot peppergrass is an annual or biennial plant, listed in 2009 by the US Fish and Wildlife Service, as a threatened species under the Endangered Species Act of 1973, as amended [74 Federal Register (FR) 194]. However, on August 8, 2012, the United States District Court for the District of Idaho ordered that the final rule listing *Lepidium papilliferum* (slickspot peppergrass) as a threatened species under the Endangered Species Act of 1973, as amended, be vacated and remanded for further consideration consistent with the court's decision. For the time being, the USFWS considers slickspot peppergrass to be a proposed species under the Act. Therefore, the BLM is conferencing with the USFWS under section 7 to ensure conservation of the species and adherence to the LEPA Conservation Agreement between the two agencies. Botanical surveys completed in this northeastern area documented the occurrence of unoccupied slickspots. Upon subsequent surveys, if the slickspots are determined to be suitable habitat, the greenstrip mix will exclude species with invasion potential within a mile of proposed seeded fuel breaks and treatments will be in accordance with the conservation agreement between the USFWS and BLM.

There are no BLM Type 2 species in the project area, but several Types 3 and 4. The Type 3 and 4 plants known to occur within one mile of proposed fuel break treatments are discussed below.

BLM Type 3 - These are species that are globally rare or very rare in Idaho, with moderate endangerment factors. Their global or state rarity and the inherent risks associated with rarity make them imperiled.

- **Davis' pepperweed** (*Lepidium davisii*) is a perennial forb that occurs in flat, seasonally flooded playas at elevations ranging from 2,500 to 5,000 feet. While the playas are typically barren, the surrounding vegetation is usually big sagebrush or shadscale. This species is a regionally endemic species restricted to Ada, Elmore, Owyhee, and Twin Falls counties. The distribution of this species is divided into six population centers; the project area is within the "Bruneau Desert" center which encompasses approximately 670 square miles of the Owyhee plateau. Extensive surveys have been completed for this species throughout the area. Threats include; livestock grazing, stock pond developments, vehicle use, invasive weeds, dozer lines/mechanical disturbance, fire, and herbicides. Within one mile of proposed treatments there are twenty occurrences of this species in the project area.

- **Osgood Mountain milkvetch** (*Astragalus yoder-williamsii*) is a small perennial forb and a former federal candidate for listing as threatened or endangered and is of particular concern due to its limited distribution. The range of this species includes Humboldt County, Nevada and Owyhee County, Idaho. This perennial species is found in mountain big sagebrush and low sagebrush communities. Distribution of this species within one

mile of proposed treatments is limited to three populations in the southwestern portion of the project area.

- **Spreading gilia** (*Ipomopsis polycladon)* is a prostrate growing annual forb that can grow in dry, open areas in salt desert shrub communities on silty or sandy soils between 2,600 and 4,900 ft in elevation. In Idaho it is found in Butte, Elmore, Owyhee, and Power counties, elsewhere it occurs in California, Nevada, Utah, Colorado, Texas, Arizona, and into Mexico. Distribution of this species within one mile of proposed treatments is limited to a single occurrence in the northwestern portion of the project area.

BLM Type 4 - These species are generally rare in Idaho with small populations or localized distribution and low threat levels. However, due to the small populations and habitat area, certain future land uses in close proximity could significantly jeopardize them.

- **Packard's cowpie buckwheat** (*Eriogonum shockleyi* var. *packardiae* is a low growing perennial forb that can occur on gravelly benches on lake bed sediments in shadscale, mixed desert shrub, and sagebrush communities. Habitat for this species is characteristically sparse in vegetation because of the unproductive, clay-rich soils. The range of this species includes Inyo County, California across central Nevada to western Utah. In Idaho it occurs in Elmore, Gooding, Owyhee, and Twin Falls Counties. Distribution of this species within one mile of proposed treatments is limited to a single occurrence in the northeastern portion of the project area.
- **Simpson's Hedgehog cactus** (*Pediocactus simpsonii* var. *robustior*) is a small perennial ball cactus that can occur on rocky or sandy benches and canyon rims. The range of this species includes Nevada, Wyoming, Utah, Colorado and the following Idaho counties: Cassia, Idaho, Nez Perce, Oneida, Lemhi, Owyhee, and Twin Falls. The rocky nature of its habitat generally protects this species from disturbance. This Watch list species is of low conservation risk due to its relative abundance and slightly higher tolerance for disturbance. The distribution of this species in the project area is limited to one population near Sheep Creek in the southeastern portion.
- **White-margined wax plant** (*Glyptopleura marginata*) is a small annual forb that occurs on dry sandy-gravelly or loose ash soils in plant communities of; shadscale, greasewood, rabbitbrush, spiny hopsage, winterfat, and sagebrush at elevations between 2,600 and 3,900 feet. The distribution range for white-margined wax plant is; se Oregon, w Nevada, California, Utah, in the following Idaho counties Elmore, Owyhee and Twin Falls. Distribution of this species within one mile of proposed treatments is limited to two populations in the northeastern portion of the project area.
- **Rigid threadbush** (*Nemacladus rigidus*) is a very small annual forb that grows in sandy or cindery soils in the desert shrub zone at elevations between 2,600 and 3,900 feet. The distribution range extends from Owyhee county Idaho, se Oregon, Inyo county California, and Nye county Nevada. Distribution of this species within one mile of proposed treatments is limited to two populations in the northwestern portion of the project area.
- **Spine-noded milkvetch** (*Peteria thompsoniae*) is a low growing perennial forb. In Idaho it only occurs in volcanic sands along the Owyhee front between 2,750 and 4,265 feet. in elevation. Elsewhere in its range it occurs in desert shrub communities in dry washes,

flats, ridges and talus. Distribution of this species within one mile of proposed treatments is limited to two populations in the northwestern portion of the project area.

3.2.2 Environmental Consequences

3.2.2.1 Alternative A

General Vegetation - The potential for large scale (> 1000 acres) wildfire occurrences would continue to pose a risk to mature shrub steppe plant communities. Burned areas have much fewer shrubs for several years until they become re-established. The time required for a mature shrub steppe plant community to return to pre-fire conditions varies by the climatic conditions, fire severity, and size of the fire as well as the condition of the plant community prior to the fire. With frequently recurring fires, stands of sagebrush become more fragmented and at an increased risk from invasive non-native annual grasses and forbs. Increases in annual plants results in a continuous and highly flammable biomass, creating prime conditions for fire to carry through an area. Areas currently dominated by cheatgrass would continue to increase and expand, further increasing the risk of stand replacing wildfires.

Noxious Weeds – Under this alternative, wildfires would have greater potential to burn large areas from the lack of fuel breaks, thereby increasing the potential for the spread of noxious weeds. Following wildfires, the weed spread risk increases because of the temporary decrease in competition from other plants. The BLM and local cooperative weed management group would continue to monitor and treat populations of noxious weeds, as time, staff, and funding allow. However, this effort would not be expected to eradicate all noxious weeds in the area.

Special Status Species – The potential for habitat loss would be greater than in Alternative B due to the increased risk of large scale wildfires and subsequent increase of invasive non-native annual grasses and noxious weeds.

3.2.2.2 Alternative B

General Vegetation – Mowing would result in localized mortality of larger and older sagebrush, especially over the long-term with repeated mowing for maintenance. However, it is expected that new sagebrush plants would continue to exploit the open niches from the periphery of the fuel break areas. Herbaceous species, such as grasses and forbs, would be expected to increase with the reduction of shrub canopy. Fall mowing could result in an increase of young sagebrush plants during the first few years. Mowing effects would differ depending on the condition of the plant communities; where few perennial grasses occur; annual grasses would potentially increase, resulting in increased need for herbicide treatments.

The use of ground-applied herbicides poses a moderate risk to general vegetation from drift during application that could result in mortality to some non-target plants. Standard operating procedures and manufacturer's label recommendations would be adhered to, which would reduce the risk to an acceptable level. Additionally, timing of application based on plant phenology would have differing effects to target and non-target species. Herbicide effects 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 creation of fuel breaks would result in the loss of a few native perennial plants; however, the majority of proposed fuel break plantings are located where either cheatgrass or exotic perennial grasses occur as a result of wildfire or fire rehabilitation treatments. The vegetative fuel breaks (greenstripping) would replace cheatgrass with more fire resilient and/or resistant plant species. The loss of small areas of sagebrush habitat would be offset by the increased potential to protect and retain large intact stands of existing sagebrush. Intact stands of sagebrush plant communities would be less likely to become fragmented or to convert to annual dominated grasslands. Reducing the risk of fire increases the stability of native plant communities and potentially reduces fire return intervals.

Noxious Weeds – Proposed treatments of mowing or seeding would increase soil disturbance and reduce competition from woody plant species, which would result in an increase in herbaceous plant cover and vigor, including noxious plant species, when present. Weedy species benefit from soil disturbance, reduced competition, and increased light.

Special Status Species - Fuel breaks would provide increased protection for special status plant habitat from wildfire in areas interior to the treated routes. Protection from wildfire could result in greater long-term stability for populations of special status plants. To minimize potential impacts from mowing, treatments would not occur within 100 feet of playas with populations of pepperweed. This buffer would provide adequate undisturbed native vegetation adjacent to playas to retain habitat integrity. Other special status plants occurring within one mile of proposed treatments are all low growing and impacts from mowing would be very unlikely, known occurrences would be marked for avoidance with seeding equipment where feasible.

The use of herbicides to control invasive annuals would have a negative impact to special status plant species if direct contact was made with foliar herbicides or if systemic herbicides were used in close proximity to known populations of these species. Persistent herbicides would not be used within 100 feet of Davis' pepperweed populations. However foliar herbicide would be allowed up to 10 feet of the playa edge using ground application methods, and pedestrian application methods would only be used closer than 10 feet. Because of the propensity for forage kochia (*Kochia prostrata*) to inhabit playas, its use in seed mixes would be restricted to a minimum of one-half mile from playas. Herbicide effects 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). Standard operating procedures for herbicide applications (Appendix 7.5) described in the Record of Decision for the PEIS would be adhered to, and would reduce risk of impacts to non-target species (USDI BLM 2007b).

3.2.2.3 Alternative C

General Vegetation - Establishing a greenstrip, rather than mowing, would result in more disturbance, sagebrush loss, and increase of herbaceous species than Alternative B. Drill seeding disturbances would increase the spread and expansion of invasive annual grasses and forbs during establishment of perennial species. This lag time of perennial plants in the fuel breaks could result in the need for herbicide applications to control annual weedy species. In addition, the increased amount of greenstripping would increase use of herbicides, increasing the overall risk to non-target plants. The increased risk from herbicide drift would be as described in the

Vegetation Treatments using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement (USDI BLM 2007a).

Noxious Weeds - Noxious weeds increase when established plants are removed or when soil disturbance occurs. Therefore, removal of existing vegetation and soil disturbance associated with drill seeding would increase the potential for noxious weed expansion and increase the amount of post-treatment herbicide treatments. The risks of herbicide use have been described in the *Vegetation Treatments using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* (USDI BLM 2007a).

Special Status Species - Impacts from greenstripping rather than mowing would result in an amplified effect to special status plants that occur within or adjacent to seeded areas. Special status plants rely on intact native plant communities for habitat. The shift from a native plant community structure to grassland could result in loss of habitat for species unable to adapt and eventual loss of some populations of special status plant species. To protect the integrity of playas, treatments buffers described in Alternative B for Davis' pepperweed would apply to treatments proposed in this alternative. The risk to special status plants from increased use of herbicides would be similar to that described for Alternative B above.

3.2.3 Cumulative Impacts

Of the identified cumulative effects actions, livestock grazing and herbicide treatment for noxious weeds pose potential risks. The analysis scale for cumulative vegetative impacts is variable; for general vegetation and noxious weeds, the extent of the project area is sufficient to describe effects since approximately 0.7 percent (3,042 acres) of the 420,391 acre project area would be directly affected by proposed actions. However, for special status plant species; limited distributions, soil limitations, and various levels of imperilment, the cumulative effects extent is necessarily much larger. For those reasons, southwestern Idaho bounded on the east by the Bruneau River, and the north by the Boise River is sufficient for cumulative effects analysis. Although livestock grazing poses a certain level of risk of impacts through consumption and trampling, these effects are largely dispersed both temporally and spatially. Under the assumption of proper livestock management and improving conditions, negative effects to general vegetation in the project area would be negligible or very slight. The ongoing cooperative weed management treatments would be expected to control the increase in noxious weeds. Total eradication of noxious weeds is difficult if not impossible to attain and extremely unlikely. Having noxious weed treatment as a design feature in this project reduces the risk of rampant noxious weeds. Biological control agents are becoming increasingly effective on some weed species and more agents are likely in the near future. Therefore, it would be expected that there would be no net change in noxious weed occurrence under Alternatives B or C.

Cumulative impacts to special status plants from livestock grazing and noxious weeds treatments is not expected to cause compounding effects. The Boise District BLM addresses effects to special status plants in environmental assessments for livestock grazing permit renewals. Through this assessment process, season of use and livestock distribution are adjusted to maintain or improve habitat while minimizing adverse effects to special status species. Additionally, livestock management projects such as fencing, water haul locations, and watering troughs require botanical surveys for special status plant species which affects small areas (< 10 acres total) of habitat.

3.3 Wildlife

3.3.1 Affected Environment

The project area lies mostly within the previously discussed Dissected High Lava Plateau Level IV Ecoregion, consisting of rolling plains, hills, sheer-walled canyons, and isolated mesas. Wildlife habitat is sagebrush steppe, including Wyoming, mountain big, and low sagebrush; antelope bitterbrush; native perennial grasses, such as Thurber needlegrass, bluebunch wheatgrass, Idaho fescue, and Sandberg bluegrass; and various non-native species, including cheatgrass. The project area's north eastern portion, mainly north of the CCC road, has dense cheatgrass infestations, where multiple fires have led to loss of sagebrush and other native vegetation. Cheatgrass expansion following wildfire is a serious threat to wildlife habitat in the lower elevation Wyoming big sagebrush areas. Several wildfires, within and near the project area, have shown that a single fire can result in thousands of acres of suitable habitat being lost, including habitat for sage-grouse and other sagebrush obligate species.

The project area provides cover, forage, and suitable nesting habitat for several species common to southern Idaho and the Northern Great Basin. The project area also includes portions of one of the last remaining strongholds for sage-grouse in the west. In the 2011 *SW Idaho Fire Management Plan* update (BLM 2011), the project area was identified as a sage-grouse priority wildfire suppression area. While sage-grouse are this project's focus, many species would benefit from preservation of sagebrush habitat. However, not all species known to exist in the project area will be discussed in this EA. A table of federally listed and Idaho BLM Sensitive Species in the BFO can be reviewed in Section 7.3.

The species analyzed in this EA, except for pronghorn antelope, are either identified by USFWS as Candidate species [warrant listing under the Endangered Species Act of 1973 but are precluded due to higher priority listings], as BLM Sensitive, or as Species of Greatest Conservation Need (SGCN) by IDFG (2005). The species analyzed were chosen because of their special status and representation of effects for similar species. For this EA, the following will be used for evaluation purposes:

- Ferruginous hawk - effects to raptors
- Greater sage-grouse - a standalone species
- Brewer's sparrow - effects to migratory birds
- Western ground snake - effects to reptiles
- Pygmy rabbit - effects to small mammals
- Pronghorn antelope - effects to large mammals

Because there would be no impacts to riparian habitat and water quality, amphibians, mollusks, and fish will not be discussed.

Ferruginous Hawk – This hawk species prefers flat or rolling landscapes in sagebrush shrublands and other arid environments. It nests on rimrock, cliff ledges, rock outcrops, shrubs, haystacks, junipers, anthropogenic structures, man-made nest platforms, or, occasionally, on the ground. The project area provides suitable foraging and nesting habitat, although no nest sites have been documented. 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. Due to the

sagebrush habitat in the project area, this species likely feeds primarily on jackrabbits. Ground nests typically are located far from human activities, and on elevated landforms in large grassland areas (Dechant et al. 2003). Tree-nesting hawks seem to be less sensitive to surrounding land use, but still avoid areas of intensive agriculture or high human disturbance (Dechant et al. 2003). Ferruginous hawks are easily disturbed during the breeding season (Keeley and Bechard 2011; White and Thurow 1985). Dechant (2003) 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, and that most primary threats originate from the loss of historically occupied habitat, or 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 that habitat loss and degradation occur on a broad scale, and retaining large, intact tracts of grassland and shrub-steppe present the major challenge to preserving viable populations of ferruginous hawks.

This species is considered Sensitive by BLM and a SGCN by IDFG. Over forty percent of their southern Idaho habitat has been altered, and numbers have dwindled (IDFG 2008). The species can benefit from actions that focus on maintaining sagebrush habitat and prey populations (Ibid). A more recent concern is the development of wind farms, such as those in southern Idaho, where hawks could potentially collide with turbines during spring and fall migration (Ibid).

In addition to ferruginous hawks, several other raptors utilize habitat throughout the project area. Some commonly observed species include prairie falcon, golden eagle, 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. Golden eagles are also protected by the Bald and Golden Eagle Protection Act, as amended in 1990.

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. Habitat loss, as a result of activities discussed above, is the leading cause of sage-grouse declines across its range.

In March 2010, a BLM Instruction Memorandum (IM 2010-071) directed field office managers to implement appropriate sage-grouse conservation actions based on preliminary priority sage-grouse habitat. Up until that point, Idaho's sage-grouse habitat had been classified on vegetation characteristics.

In contrast, preliminary priority habitat (PPH) is defined as "the habitat of highest conservation value relative to maintaining sustainable sage-grouse populations range-wide". The IM also directed managers to identify preliminary general habitat (PGH) areas, which represent areas of suitable sage-grouse habitat not contained in PPH. Preliminary priority and general habitat are

based on use of habitat by sage-grouse, whereas key and R1-3 habitat (Table 5) are based on vegetation characteristics. Preliminary priority and general habitat areas were still being finalized during the development of this project. Key habitat and PPH are closely aligned within the project area (see Map 4) and the percentage of acres impacted by action alternatives is the same. Because the initial analysis was completed using key habitat and since there is no difference in percentage of acres impacted between key and preliminary priority habitat, preliminary priority habitat was not included in the analysis other than to illustrate that acres impacted are the same as key habitat.

Table 5. Greater sage-grouse habitat classification and acres in the project area and Bruneau FO

Habitat Classification	Acres in the project area*	Acres in the BFO*
Key[1] Sage-grouse Habitat	218,994	1,306,291
Type I, Perennial Grasslands[2] (R1)	121,528	167,670
Type II, Annual Grasslands[3] (R2)	60,120	136,707
Type III, Conifer Encroachment[4] (R3)	0	41,877
Unclassified	19,749	252,104
Total Acres	**420,391**	**1,904,649**

*Based on the 2010 Greater Sage-grouse Habitat Layer

1 Key Sage-grouse Habitat consists of areas with generally intact sagebrush that provide sage-grouse habitat during some portion of the year.

2 Perennial Grassland: Sagebrush-limited areas characterized by perennial grass species composition and/or structure that should provide suitable potential nesting habitat in the future, once sufficient sagebrush cover is re-established (at least 10% canopy cover). Includes areas characterized by native and/or introduced perennial bunchgrasses.

3 Areas dominated or strongly influenced by invasive annuals such as cheatgrass or medusahead or similar species. Areas with sagebrush may be present, but, in general, understories are not suitable for sage-grouse. Reclassify as Perennial Grassland once restoration seedings are determined to be successful.

4 Areas where juniper and/or other conifer species are encroaching into sage-grouse habitat

It has also been recommended in WO 2012-IM 044, Attachment 1, *A Report on National Greater Sage-grouse Conservation Measures*, that BLM "design fuels management projects in preliminary priority sage-grouse habitat to strategically and effectively reduce wildfire threats in the greatest area. This may require fuels treatments implemented in a more linear versus block design". Additionally, BLM IM 2012-043 advises managers to "comply with the policies established in BLM IM 2011-138 Sage-grouse Conservation Related to Wildland Fire and Fuels Management."

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 (ISAC 2006; USFWS 2010a). Habitat in the project area's lower elevations that have not burned consist mainly of large tracts of Wyoming big sagebrush and grasslands, much of which is considered to have a moderate to high risk of cheatgrass invasion (USDI 2009; Map 7. Cheatgrass Invasion Risk). In fact, lower elevation areas that have burned are infested with cheatgrass. Habitat in higher elevations is generally in good condition and supports a shrub steppe mosaic of low, mountain and Wyoming big sagebrush; antelope bitterbrush; scattered aspen patches; and perennial grasslands. Low sagebrush provides suitable lekking habitat, while big sagebrush species provide suitable nesting. State Highway 51 runs roughly through the center of the project area.

Garton et al. (2011) conducted a comprehensive analysis of sage-grouse populations throughout the species' range by accumulating and analyzing counts of males at 9,870 leks identified since 1965. Trends for the NGB population, as indicated by average number of males per lek,

declined by 37% from 1965–1969 to 2000–2007. Average number of males per active lek followed the same pattern over the assessment period and declined by 17%. The sage-grouse carrying capacity in the Northern Great Basin population is projected to decline by 73% between 2007 and 2037 if current trends continue (See Fed Register 2010 Vol 75 No. 55 page13960-13961 citing Garton et al. 2011). Based on a minimum population estimate of 9,114 males in 2007, Garton et al. (2011) concluded that there is a 100% probability that the population of sage-grouse in the Northern Great Basin would drop below 500 individuals in 100 years. The 2010 USFWS 12-Month Findings for sage-grouse cited Knick and Hanser (2011, page 13961) that fire, within 54 km (33.5 miles) of a lek, was identified as one of the most important factors negatively affecting sage-grouse persistence on the landscape scale.

A large number of leks can be impacted in a single fire event. The Jacks Fire (2012) burned 48,894 acres, of which nearly all was preliminary priority habitat for sage-grouse. There were approximately 84 active leks within 33.5 miles of the burn perimeter and 3 active leks within the perimeter. Several leks were impacted by the 2007 Murphy Complex Fire. Based on BLM GIS layers, 273,749 acres of key habitat and 195,406 acres of perennial grassland habitat were burned in the 2007 Murphy Complex.

Sage-grouse numbers have been monitored for several years, by both aerial and ground surveys of active leks and from harvest data. Harvest data, for a 10-year average, indicate a direct loss of approximately 8,100 sage-grouse resulting from statewide hunting, of which approximately 1,445 birds are harvested from southwestern Idaho, which includes the project area (IDFG 2010). Direct take of this species through hunting has continued with a 2012 sage-grouse hunting season.

Data from annual aerial surveys in the Grasmere block overlapping the project area, indicate that populations declined by 60% from 2005 to 2008 (Figure 5). Numbers steadily increased from 2008 through 2011 (787 birds counted) but in 2012 (699 birds counted).

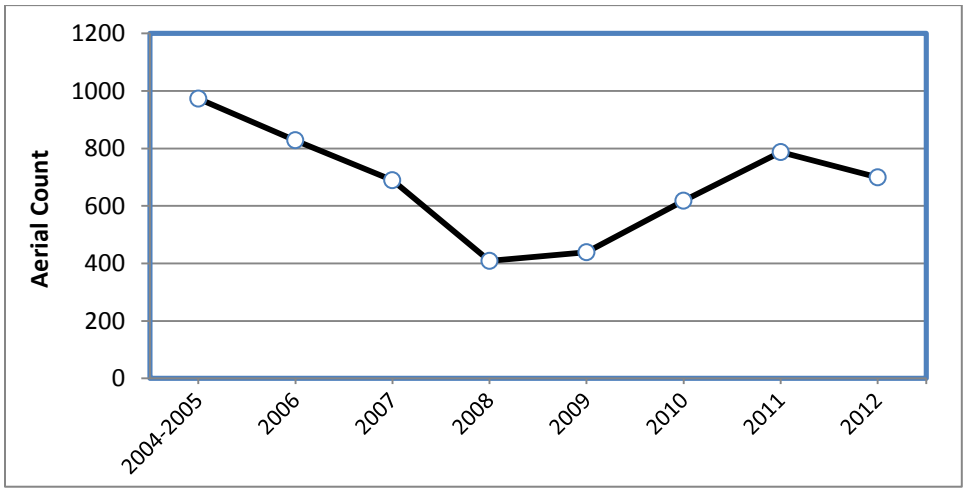


Figure 5. Male lek attendance in annually-surveyed area (Grasmere Block) from 2005-2012.

While many factors can impact sage-grouse numbers within a short timeframe, as seen above, large scale habitat loss, caused by fire, development, or invasive vegetation, can cause long-term

or permanent habitat loss. Long-term loss of habitat leads to reduced bird numbers that can last for decades or cause permanent extirpation from the impacted area. Throughout the Snake River Management Zone and the Northern Great Basin population range, numbers of sage-grouse and acres of suitable habitat have declined. In Idaho, areas such as the Jarbidge FO, Owyhee range, and Big Desert, have experienced long-term or permanent habitat loss of hundreds of thousands of acres from fire, human development, and juniper encroachment. This loss of habitat has negatively impacted sage-grouse numbers. Human development in rural areas and levels of use in the Owyhee Front is expected to grow, increasing the importance of habitat in the project area of even higher value for long-term protection.

Brewer's Sparrow – Migratory birds are protected and managed under the Migratory Bird Treaty Act of 1918, as amended, and Executive Order 13186. Accordingly, nests with eggs or young of migratory birds may not be harmed nor may migratory birds be killed. Executive Order 13186 directs Federal agencies to promote the conservation of migratory bird populations. Brewer's sparrow is a BLM Sensitive species and USFWS Bird of Conservation Concern throughout its breeding and wintering ranges (USDI 2002). The Audubon Society has given the Brewer's sparrow a watch list status of yellow, which indicates species that are either declining or rare (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). In the Snake River Birds of Prey National Conservation Area (the closest boundary of which is approximately 2 miles north of the project area), 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 (Knick and Rotenberry 2002). This species has been documented in the project area; currently thousands of acres of suitable habitat exist. However, over the last decade, hundreds of thousands of acres of Brewer's sparrow habitat has been lost to wildfire in southern Idaho. Population declines on breeding areas are likely linked to extensive alteration of sagebrush shrub steppe habitat (Holmes and Johnson 2005).

Brewer's sparrow and other sagebrush obligate species that occupied burned areas have been displaced, making the remaining sagebrush habitat more important and in need of protection from large 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.

Western Ground Snake – The western ground snake is the smallest snake species in the Bruneau Field Office and is found in Idaho in the Lower Snake River Valley (Idaho Department of Fish Game 1994) in arid and semi-arid habitat, especially near talus. It is usually associated with loose soil. This species has been documented at the north end of the project area (M. McGee, personal observation 2010).

Other reptiles that do or may exist within the project area include several species of lizards and snakes. Lizard species include sagebrush, western fence, longnose leopard, shorthorned, desert horned, side-blotched, western whiptail, Mojave black-collared lizards, and western skink. Snakes include western terrestrial garter, common garter, gopher, longnose, and night snakes such as striped whipsnake, rubber boa, western rattlesnake, and racer. The Mojave black-collared lizard and western ground, longnose, and common garter snakes are Idaho BLM Sensitive reptiles.

Pygmy Rabbit – The pygmy rabbit is the smallest North American rabbit species (USFWS 2010b). On September 30, 2010, USFWS determined that pygmy rabbits do not warrant listing under the Endangered Species Act; however, it is still managed as a special status species by both BLM and IDFG.

Pygmy rabbits are typically found in tall, dense sagebrush cover and considered a sagebrush obligate species because they are highly dependent on sagebrush to provide both food and shelter throughout the year (Green and Flinders 1980; Katzner *et al.* 1997). Pygmy rabbits have been found from 2,900 feet to over 6,000 feet in elevation in southwestern Idaho. The species was documented within the project area during 2011 surveys. Seventeen sites were identified, and and photo documentation was used to identify rabbits at several of them. All sites were in the ecological site with loamy soil 13”-16”, with vegetation dominated by mountain big sagebrush, bluebunch wheatgrass, and Idaho fescue. This species would be expected to exist in and around the project area anywhere there are deep loamy soils with sufficient annual precipitation to support suitable vegetation. Other ecological sites that may support pygmy rabbits include areas with a precipitation range of 12 to 16 inches with mountain and Wyoming big sagebrush species and an understory of Idaho fescue, and bluebunch wheatgrass; and dry meadow areas with an understory of Sandberg bluegrass, and mountain Timothy. While all of these ecological sites were surveyed, rabbits were detected in only one ecological site. There were approximately 30,336 acres of all the potentially suitable ecological sites within the project area and 25,027 acres of the ecological site type where pygmy rabbits were documented. However, after the 2012 Jacks Fire, those acres were reduced to an approximate total of 18,136 for all suitable ecological sites and 14,227 acres of the ecological site type where pygmy rabbits were documented. No mowing would occur within 50 feet of occupied pygmy rabbit burrows.

Several small mammals also occupy suitable habitat within the area, including coyote, black-tailed jack rabbit, white-tailed antelope squirrel, cottontail rabbit, least chipmunk, Belding’s ground squirrel, deer mouse, badger, bobcat, and Ord’s kangaroo rat.

Pronghorn Antelope – This species roams throughout the project area during the summer, and migrates to lower elevations where there is less snow and more forage during winter. Pronghorns are primarily a forb-eating species with strong requirements for open cover. Antelope in Management Unit 41 are meeting IDFG’s management objectives (J. Powell, IDFG Biologist, personal communication, 2011).

Other large area mammals include mule deer, Rocky Mountain elk, bighorn sheep, and mountain lion. Bighorn sheep are a BLM and IDFG special status species, but not included in the analysis

because they are generally found in canyon areas where no treatments would occur. The amount of roadside proposed for treatment near preferred bighorn habitat is minimal and effects to the species would be negligible.

3.3.2 Environmental Consequences

3.3.2.1 Alternative A

No fuel breaks would be created and areas of suitable wildlife habitat would remain in their current condition until a wildfire event occurs, at which point habitat would be degraded. Without fuel breaks, the likelihood of losing larger tracts of sage-grouse and other wildlife habitat from wildfire would remain. Habitat in the northeastern portion would continue to degrade, with the spread of invasive annuals, reducing the fire return interval. Because large fire risk would not be reduced under this alternative, its effects to representative species are discussed below.

Ferruginous Hawk –Habitat for ferruginous hawk would remain unaltered unless a fire was to occur. It is not realistic to forecast the amount of foraging and nesting habitat that could be lost to a wildfire. However, a wildfire that burns sage-steppe habitat would cause a reduction in jackrabbits and other prey species until suitable habitat re-established. Olendorf (1993, page 24 citing Schmutz and Hungle 1989, p. 368, and Woffinden and Murphy 1989, p. 1,128), stated that ferruginous hawk productivity is affected by the densities of major prey. Study results from White and Thurow (1985, p. 20), Smith et al. (1981, p. 54), and Woffinden and Murphy (1977, p. 422; 1989, p. 1,128) all indicate a correlation between the number of jackrabbits and the numbers of ferruginous hawks laying eggs, eggs laid, and young produced. Squirrel numbers have been shown to fluctuate and decrease due to the loss of suitable forage (Yensen et al. 1992). The loss of sagebrush habitat in the project area would reduce jackrabbits and other prey species, which would reduce the productivity of the area for ferruginous hawks at the local and possibly at a population scale.

Additionally, the conversion of native shrub-steppe habitats to non-native annual grasslands through altered fire regimes is identified as a serious threat to ferruginous hawks in the Intermountain West (Collins and Reynolds 2005 p. 24).

Greater Sage-grouse – Conditions for this species would remain unchanged, until a wildfire occurs. A large wildfire in sagebrush habitat would negatively impact sage-grouse for 25-120 years based on sagebrush species and growing conditions (Baker 2011 pp. 194-195). This alternative would not reduce the threat and potential for losing large habitat tracts would not be reduced. Research indicates that fire negatively impacts sage-grouse habitat for several years (USFWS 2010a; Knick and Hanser 2011; ISAC 2006), including areas where the habitat consisted of mountain big sagebrush (Nelle et al. 2000). Blaisdell et al. (1982) documented mountain big sagebrush response, in southeastern Idaho after a severe fire, and found it took 30 years for sagebrush to dominate the site. Nelle et al. (2000) also found that burning had a long-term negative impact on nesting habitat because sagebrush required over 20 years of post-burn growth for sufficient percent canopy cover. Various researchers have indicated that sagebrush areas destroyed by fire are of limited to no use to sage-grouse, resulting in long-term habitat loss that require decades to recover (Nelle et al. 2000; Beck et al. 2008; Connelly et al. 2000b;

Fischer et al. 1996). Slater (2003) observed sage-grouse using burned areas but they were never further than 60 meters from the burned/unburned edge. Other researchers have indicated that sage-grouse avoid burned areas in sagebrush landscapes because habitat characteristics, important for nesting, brood concealment, and food, are destroyed by fire and have slow recovery rates (USFWS 2010a; Knick and Hanser 2011).

Fire can also reduce connectivity over large geographic areas, potentially impacting sage-grouse at local, sub-population, and management zone scales. The negative effects of fragmentation on sage-grouse are diverse and include reduced lek persistence, lek attendance, winter habitat use, recruitment, yearling annual survival, and female nest site choice (USFWS 2010c).

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

In 2006, in the Burns (Oregon) District BLM, the Pueblo Mountain Fire burned approximately 60,000 acres; thousands of which supported both mountain big and Wyoming big sagebrush. Based on the recovery level thus far, it is estimated that mountain big sagebrush will take 20+ years on south slopes and flats and 10+ years on north slopes to attain 10 percent canopy cover, thus becoming suitable sage-grouse habitat (M. Obradovich, personal communication, 2011). The areas of Wyoming big sagebrush will likely take 40-50 years to become suitable habitat. This fire also burned across seven lek sites. Since the fire, male lek attendance has steadily decreased by 80 to 90 percent of pre-fire numbers. One lek, that had over 100 males attending before, is now down to 20.

Large scale habitat loss often leads to extirpation of sage-grouse from the impacted area, although this can take a few years to occur as birds demonstrate site fidelity such as that resulting in the Pueblo Fire example above. More recent data from the Murphy Fire Complex also illustrates a time lag in the decline of lek attendance and that over the long term, sage-grouse and sagebrush obligate species are expected to continue to decline due to habitat fragmentation effects such as lower reproductive rates, and higher predation and parasitism rates (Moser and Lowe 2011). While sage-grouse would likely return once suitable habitat has recovered, this could take many years to occur. Additionally, the area may not recover to suitable habitat due to invasive annuals and noxious weeds, and would be unsuitable for an unknown period of time.

Brewer's Sparrow – Habitat for Brewer's sparrow would remain unchanged unless a fire was to occur. Additionally, the ability to effectively manage large wildfires would not be improved, and loss of large tracts of sagebrush habitat would negatively impact the species. Holmes and Johnson (2005) identify fire as a threat because it removes shrub cover, fragments large sagebrush tracts, and can reduce patch size to unacceptable levels. Knick et al. (2005) indicate negative fire responses by the sparrows, except for one burn where only 45 percent of existing shrub vegetation was lost. Given that hundreds of thousands of acres of sagebrush habitat have recently burned in southern Idaho, additional large fires would cause even greater impacts to this species. The Murphy Complex alone burned over 500,000 acres.

Western Ground Snake – Habitat for western ground snake would be altered in the event of wildfire but there is little knowledge of the direct effects of habitat alteration. In regards to direct mortality from fire events, studies and monitoring of fire effects to reptiles indicate that there is relatively little wildfire mortality (Russell et al. 1999). Reptiles are thought to seek refuge below ground, under rocks or similar protective cover or move out of the fire's way. Russell et al. (1999) cite a five year study, completed by Means and Campbell (1981) that included five prescribed fires in the study area. During those five fires, they documented two of 68 marked rattlesnakes that died. Both of them were shedding their skin, which likely affected their ability to sense or escape the fire. Over several years of wildfire suppression and rehabilitation involvement, only a few reptile mortalities have been observed, while several species of lizards and snakes have been observed in burned areas (M. McGee, personal observations, 1993 – present). Although, two western ground snakes were found dead during post-fire monitoring of the fast moving 29,000 acre Crowbar Fire that burned part of the project area in 2010 (Ibid).

Indirect effects to reptiles from fire may have greater impacts over time. A study completed in California suggests that indirect effects to habitat such as habitat suitability and predator-prey interactions were largely responsible for the changes observed in abundance and diversity of reptiles (Rochester et al. 2010, p. 345). They found that species preferring more open habitats increased, while those that preferred greater levels of cover, decreased over time. The western ground snake prefers sandy desert type habitat, which are usually more open, and are mainly nocturnal, so it is likely that this species would not be as negatively impacted as those species that prefer more cover and are more diurnal.

Pygmy Rabbit – Suitable pygmy rabbit habitat would be degraded in the event of a large wildfire. Without fuel breaks, there would be no improvement in conditions to effectively suppress large-scale wildfire. The loss of suitable sagebrush habitat would have negative effects to pygmy rabbit. USFWS (2010b) cite Gates and Eng's 1984 study documenting the deaths of "several" pygmy rabbits in an area where fire advanced rapidly within an Idaho prescribed burn. Gates and Eng also reported that two months following fire in a big sagebrush-grassland community, only three of 11 radio-collared rabbits were alive. Of the eight lost, seven were due to predation. They speculated that the loss of big sagebrush from the rabbits' home ranges probably increased predator vulnerability. Additionally, losses of sagebrush cover from fire result in less forage, increased habitat fragmentation, and abandonment of home ranges (USFWS 2010b).

While Larrucea and Brussard (2008b) found fire to be the strongest loss predictor for pygmy rabbits from Nevada and California sites, observations have been made of pygmy rabbits existing within burned areas; however, the sightings were associated with smaller burned areas (USFWS citing Bockting 2007, White and Bartels 2002, and Waterbury 2005).

Pronghorn Antelope – Habitat would likely improve for this species in the event of a large wildfire. As a primarily forb-eating species with strong requirements for open cover, pronghorn are favorably influenced by herbaceous species' increases and shrub reduction after fire (Higgins et al. 1989). Pronghorn used burned range significantly more than unburned range during the fall, after snow cover is melted in winter, and early spring (Courtney 1989). Nutritional forage

benefits after fire, including higher levels of protein and minerals, may last up to four, post-fire years with an increase in primary productivity for a longer period, depending upon plant species (Howard 1995 citing USDI 1966). Although pronghorn benefit from fire as noted above, habitat loss to cheatgrass and increased fire frequency would not be beneficial.

3.3.2.2 Alternative B

Habitat composition and structure would be altered where treatments are completed through greenstrip establishment, herbicide spraying, and roadside mowing of shrubs. These actions are analyzed for the representative species.

Application of herbicides would occur over the 11 miles (400) acres of newly developed greenstrips. For this analysis, it is assumed that chemical treatment would occur over the remaining 117 miles (2,642) of existing greenstrips and mowed fuel breaks even though the actual miles treated may be much less. Treatments during the life of the project would be completed as needed to maintain the effectiveness of established fuel breaks.
Potential impacts of the chemical treatment to wildlife vary depending on type of herbicide and the duration and mechanism of exposure (Tables 6 and 7). 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). The PEIS (p. 4-102) 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. It further states that birds, mammals, or insects that eat grass that has been sprayed with herbicides have relatively greater risk for harm than animals that eat other vegetative material, because herbicide residue is higher on grass (Fletcher et al. 1994; Pfleeger et al. 1996); however, harmful doses of herbicide are not likely unless the animal forages exclusively in the treatment area for an extended period of time (USDI BLM 2007a). The likelihood of animals foraging for an extended period of time in the proposed fuel breaks is unlikely because they would be located next to roads and have reduced hiding cover. The probability of harmful contamination is further reduced by the minimal area treated across the large landscape in the project area. While adverse effects from herbicides to wildlife could occur, the actual risk is low based on the following rational:

- Harmful doses of herbicide are not likely unless the animal forages exclusively in the treatment area for an extended period of time. The likelihood of animals spending large amounts of time foraging in fuel breaks is low due to reduced cover and the fuel breaks are adjacent to roads. Additionally, there is a vast amount of suitable habitat available away from roads.
- The predictions of potential adverse effects from herbicides are overly conservative in that they assume 100% of the animal's diet would consist of contaminated vegetation, which would be unlikely unless the animal's entire habitat was treated (USDI 2007c).
- The number of acres treated in the project area is minimal when compared to the acres of suitable habitat within and surrounding the project area.
- Application would be applied under 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* (PEIS) (USDI BLM 2007a, Appendix B).

- Herbicide treatments would be target undesirable vegetation. Reduction of noxious weeds and invasive annuals would improve habitat conditions for wildlife.

Table 6. Risk of adverse effects to migratory birds and sage-grouse (large avian herbivores) from exposure to herbicides approved for BLM use[1].

Herbicide	Risk Level of Adverse Effects to Migratory Birds
2,4-D	Moderate to high risk to large avian herbivores from acute and moderate from chronic exposure. High risk to small avian insectivores from acute exposure.
Chlorsulfuron	No risk under any exposure scenario.
Clopyralid	Low risk to small avian insectivores and large avian herbivores for acute exposure at maximum application rate. Low risk to large avian herbivores for chronic exposure at maximum application rate.
Dicamba	Low to moderate risk to small avian insectivores from acute exposure. No risk to large avian herbivore.
Imazapic	No risk under any exposure scenario.
Glyphosate	Low risk to large avian herbivores from both acute and chronic exposure. Low to moderate risk to small avian insectivores from acute exposure.
Metsulfuron methyl	No risk under any exposure scenario.
Picloram	Low risk to large avian herbivores with chronic exposure at maximum application rate. No risk to small avian insectivores.
Tebuthiuron	Low risk to small avian insectivores from acute exposure and no risk to large avian herbivores.
Triclopyr	Low to moderate risk to large avian herbivores from both acute and chronic exposure. Low to moderate risk to small avian insectivores from acute exposure.

1 – Data compiled from (DOI-BLM 2007a: 4-103, 4-107).

Table 7. Risk of adverse effects to wildlife from exposure to herbicides approved for BLM use.

Herbicide	Risk Level of Adverse Effects to Wildlife[1]	
	Small Mammals	Large Mammals
2,4-D	Moderate to high risk from acute exposure associated with the consumption of contaminated insects. No risk from chronic exposure associated with the consumption of contaminated vegetation either on or off-site.	Moderate risk from acute exposure from the consumption of contaminated grass. Moderate risk from chronic exposure associated with the consumption of contaminated vegetation on-site. No risk from chronic exposure off-site.
Chlorsulfuron	No risk under any exposure scenarios.	No risk under any exposure scenarios.
Clopyralid	Low risk from acute exposure associated with the consumption of contaminated insects. No risk from chronic exposure associated with the consumption of contaminated vegetation either on or off-site.	Low risk from acute exposure associated with the consumption of contaminated grass. Low risk from chronic exposure associated with the consumption of contaminated vegetation on-site. No risk from chronic exposure off-site.
Dicamba	No to low risk under both acute and chronic exposure scenarios.	No to low risk under both acute and chronic exposure scenarios.
Imazapic	Low to moderate risk from acute exposure associated of the consumption of contaminated grass. No risk from chronic exposure.	Low to moderate risk of from acute exposure associated with the consumption of contaminated grass. Low risk from moderate exposure.
Glyphosate	No to low risk from acute exposure. No risk from chronic exposure.	No to low risk of acute exposure. No risk from chronic exposure.

Herbicide	Risk Level of Adverse Effects to Wildlife[1]	
	Small Mammals	Large Mammals
Metsulfuron methyl	Low to moderate risk from acute exposure. No risk from chronic exposure.	Low to moderate exposure from acute exposure. No risk from chronic exposure.
Picloram	Low risk from chronic exposure. No risk from acute exposure.	Low risk from chronic exposure. No risk from acute exposure.
Tebuthiuron	Low to moderate risk from acute exposure. Low to moderate risk from chronic exposure.	Low to moderate risk from acute exposure. Low to moderate risk from chronic exposure.
Triclopyr	No risk under any exposure scenarios.	No risk under any exposure scenarios.

1 – Data compiled from (DOI-BLM 2007a: 4-103, 4-107).

Ferruginous Hawk – Effects to this species would be negligible, consisting of temporary disturbance from mechanized equipment and human presence.

Greenstripping/Mowing Roadside Shrubs – Ferruginous hawks prefer open shrub steppe and grassland habitat, and they would not be negatively impacted by changes resulting from the proposed treatments. The seasonal restrictions would protect birds from disturbance during the nesting season. The minimal habitat alteration would not reduce prey numbers.

Application of Herbicides – Common prey of ferruginous hawks have a low probability of contamination from the herbicides proposed for use. The herbicide 2,4-D poses a moderate risk of adverse effects to jackrabbits and squirrels if they are directly sprayed, or if they were to consume contaminated vegetation. There are thousands of acres of suitable habitat for ferruginous hawk prey species so the percentage of prey that comes from treated areas would likely be low. The potential of adverse impacts to ferruginous hawks from application of herbicides would be low.

Greater Sage-grouse – During scoping, issues concerning the effects to sage-grouse were received. The issues and how they would be addressed or why they do not result in an impact is explained below:

1. Habitat fragmentation – There are no exact figures that define what constitutes fragmentation when considering areas of mowed sagebrush. Sage-grouse regularly utilize mowed alfalfa fields when available (USFWS 2010 p. 7 citing Schroeder et al. 1999; Connelly et al. 2000a p. 971), and open grassy meadows grazed by livestock (Beck and Mitchell 2000; USFWS 2010 p. 30 citing Klebenow 1981). Sage-grouse also utilize and travel through areas of low sagebrush, which often consists of vegetation around 12" in height. Low shrub height or grassy areas that would exist after mowing do not constitute fragmented habitat or a movement barrier because sage-grouse readily move from big sagebrush habitat into low sage areas. The project area is a mosaic of low sagebrush and big sagebrush species. In contrast, large fires do fragment habitat and can leave thousands of acres unsuitable to sage-grouse for decades.

2. Disturbance to lekking birds – From March 1 through July 31 treatments would be limited to actions and areas where effects to sage-grouse lek attendance, nesting, and early brood rearing would not occur (i.e. spot weed treatments, greenstrip seeding outside of occupied habitat). Jenni and Hartzler (1978) found that males began attending leks in early March in Montana. Dalke et al. (1963) indicated that in the Big Desert area of Idaho, male lek attendance begins in

March and increases rapidly during the first two weeks of April. Activity restrictions near leks normally begin March 15 at lower elevations in Idaho (Idaho BLM IB 2010-39) but restrictions for this project would begin March 1.

3. Loss of habitat from cheatgrass invasion – Those areas where cheatgrass is prevalent and in areas where it increases to moderate or thick densities after mowing or greenstrip development would be treated with an appropriate herbicide. Invasive annual grasses would likely be treated with imazapic. Baker and Lyon (2009) noted the use of imazapic led to a 67% reduction in cheatgrass in their study but they acknowledged other studies that have had near 100% reduction (Kyser et al. 2007; Shinn and Thill 2002). Herbicide treatments would impact some native vegetation as well but the area treated would be much less than the average acres burned each year in the BFO (approximately 16,326 acres) based on the last ten years of fire data. Post-project monitoring would be completed to identify areas that need treatment. The proposed treatment areas near roads would be much easier to monitor and treat in comparison to miles dozer lines associated with fire suppression.

Sage-grouse and their habitat would be impacted to varying degrees based on the treatment. Vegetation structure would be altered through mowing and greenstrip treatments, but sage-grouse would not avoid treated areas. Destin Harrell (BLM Biologist, Cody, Wyoming) observed sage-grouse roosting in mowed sagebrush strips (personal communication, 2011). Greenstrips development would alter less than < 20 total acres of sagebrush habitat and maintenance may remove scattered or isolated sagebrush plants but the overall characteristic of vegetation within greenstrip areas would remain the same as current condition.

Lyon and Anderson (2003) determined that habitat near roads is of lesser quality due to disturbance. Disturbance levels along some roads in the project area during the time of lek attendance and nesting is minimal, so it would be expected that sage-grouse hens in the project area are not pressured to avoid establishing a nest near lesser used roads. To avoid disturbance during the breeding and nesting periods, seasonal restrictions would be implemented and ensure that lekking, nesting, and early brood rearing would not be interfered with (See project design features p. 15). Reducing sagebrush cover by developing fuel breaks near roads would have much less of an impact when compared to a large area of habitat lost to fire.

Mowing Roadside Shrubs – This action would alter sagebrush and other shrub habitat along roadsides in a 100 foot-wide swath by mowing shrubs to a height of 6”-12” on 50 feet of each roadside or 100 feet on one side. This action would reduce cover for sage-grouse and alter available forage by 12 acres per mile. There are 75 miles proposed for mowing, which equates to a approximately 909 acres. Of these 75 miles, 66 (800 acres) are in key sage-grouse habitat which is 0.5% of the key habitat present in the project area. In comparison, the proposed action would impact 58 miles of preliminary priority habitat or 694 acres, which is 0.5% of the preliminary priority habitat in the project area.

In contrast to the proposed action, approximately 157,573 acres have burned in the BFO since 2010. Also in those years, more than 101 miles of dozer line were put in and 72,669 acres of key habitat were consumed by wildfire. During 2012, approximately 52,146 acres of preliminary priority sage-grouse habitat in the BFO was burned, of which, 48,894 acres were burned in the Jacks Fire, impacting more than 50 leks. Analysis completed since the EA was originally signed indicates that there were approximately 87 active leks within 33.5 miles of the Jacks Creek Fire

burn area. Knick and Hanser (2011 p. 403) 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. While mowed strips do alter vegetation structure, it does not lead to complete habitat loss for sage-grouse as large scale fires does.

Greenstrips – Development would occur in areas previously greenstripped or burned, where the threat of cheatgrass invasion is a major concern, and where cheatgrass is established. Of the 51 miles to be managed as greenstrips, 42 miles already exist but need maintenance treatment of either herbicide, seeding or both. Eleven miles of greenstrip are to be developed. Three miles would be developed along a roadside that has been identified as perennial grassland but is actually dominated by cheatgrass. None of these three miles are in key habitat but 1.8 miles are within preliminary priority habitat. There is minimal sagebrush in the 1.8 mile section and this is a negligible amount when compared to the project area and field office perspectives. The three miles of greenstrip to be developed are on the north side of a road that is dominated by cheatgrass while the south side has more sagebrush. Very little sagebrush would be removed (less than 20 total acres) to develop the three miles of greenstrip.

The remaining eight miles proposed for development are within the perimeter of the Big Hill Fire, where key habitat was burned. Greenstrips would reduce the acreage burned by slowing the fire's progress and providing an area for fire fighters to safely engage in suppression actions. If the fire return interval could be increased (longer time periods between fire events) in grassland areas, sagebrush would have the opportunity to reestablish and lead to restoration of suitable sage-grouse habitat. Temporary fencing to control livestock may be required to allow greenstrips to establish. There are no greenstrips within 2 miles of an active lek. Fencing would be constructed according to specifications identified in IM No. ID-100-2011-001 to reduce collisions by sage-grouse and other wildlife species and following the guidelines specified in BLM IM 2012-043.

The Bruneau Field Office has approximately 1,306,291 acres of key sage-grouse habitat, 218,994 of which are within the project area. In the project area, there are only 1,006 acres of key habitat altered by the proposed action or 0.5%. That equates to less than 0.08% of the key habitat in the BFO (Table 8). Additionally, the proposed action would alter approximately 1,236 acres or 0.6% of perennial grassland R1 sage-grouse habitat in the project area. The amount of quality habitat impacted by the proposed action would have negligible effects to sage-grouse, especially since the area impacted is adjacent to roadways. Seasonal restrictions would provide extra protection to sage-grouse from potential effects due to project implementation.

Research into large scale fires, which this project would help prevent, have demonstrated detrimental impacts to multiple life stages of sage-grouse that can last for decades (see Alternative A - Impacts Analysis). Implementing the proposed action would reduce the likelihood of large scale fire and widespread habitat loss across thousands of acres, as well as the associated time necessary for vegetation recovery if the burned area were able to recover. There is habitat loss with the proposed action; however, this loss is negligible and not expected to have detrimental effects to sage-grouse. Protecting large tracts of sage-brush from wildfire would provide long-term benefits to sage-grouse.

Table 8. Alternative B: Miles of treatment in sage-grouse habitat types

Habitat Type	Mowing	Greenstrip Develop	Greenstrip Maintenance
Key	66	0	4*
Perennial Grassland (R1)	9	3	28
Annual Grassland(R2)	0.0	0.0	10
Burned (2011 Big Hill Fire)	0.0	8	0.0
Totals	75	11	42

*This key habitat is in an existing fuel break and is being maintained. These acres are not included in key habitat acres altered.

Because such a small proportion of the quality habitat available to sage-grouse in the project area and surrounding region is impacted from proposed actions and the treatments are next to roads, and because appropriate design features are incorporated, effects to sage-grouse would be negligible.

Application of Herbicides – The 12 Month Finding for sage-grouse stated that 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, p. 15) concluded that herbicides applied at recommended rates should not result in sage-grouse poisonings (USFWS 2010a). The USFWS indicate that impacts could occur from a reduction in forbs for nesting hens, but the probability of such impacts occurring within the project area are low due to the limited area treated and the location of treatments being near roads. The highest risk to sage-grouse would occur from acute consumption of grass sprayed by 2,4-D, with a moderate risk level at typical application rates and high risk at maximum application rates. Herbicide residue is higher on grass than other vegetation and seeds. However, the proportion of grass in the diet of sage-grouse is negligible (Wallestad and Eng 1975; Barnett and Crawford 1994; Drut et al. 1994); therefore, the risk of adverse effects from ingestion of 2,4-D is low.

Based on the information provided above and the herbicide information provided on pages 45 - 48, the risk of adverse effects to sage-grouse from the proposed herbicide treatments is low.

Brewer's Sparrow – Implementation of proposed action would lead to short-term displacement due to the presence of humans and mechanized equipment. Impacts due to changes in habitat structure and vegetation composition would be long-term impacts that would change bird species composition in mowed areas. The potential for direct mortality is low due to the high mobility of birds and the timing restrictions that would protect nests and young birds. Mowing would not occur until fall when fire danger is decreased.

Ingelfinger and Anderson (2004) studied the effects of roads developed for energy extraction on passerine birds. Overall, they 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 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 it is from a road.

Greenstrips – Development of greenstrips along three miles of road would lead to the estimated loss of less than 20 sagebrush acres. The sagebrush habitat along this road is marginal for Brewer's sparrow because it exists in small patches and is not part of a contiguous stand. Sagebrush in the other five miles of proposed development was burned during the 2011 Big Hill Fire. The amount of sagebrush habitat lost due to greenstrip development in the proposed action is minimal and would have negligible effects to Brewer's sparrow and other sagebrush obligate bird species. Migratory bird species that prefer grassland areas would have their habitat maintained or improved through the establishment and maintenance of greenstrips.

Mowing Roadside Shrubs – Mowing would reduce habitat for Brewer's sparrow by approximately 1,115 acres, which is less than 1% of the suitable habitat within the project area. While this would alter habitat structure and composition, negatively impacting some species of birds, the study by Ingelfinger and Anderson (2004) suggest that this area of habitat is marginal for sagebrush obligate species. Loss of marginal habitat from mowing along roads would be less of an impact than a fire that burned quality sagebrush habitat across hundreds or thousands of acres as has occurred in the project area over the last two years.

Application of Herbicides – In their publication on managing sagebrush habitats for birds, Paige and Ritter (1999) state that because non-native grasses and agricultural conversion now dominate so much area in the Intermountain West, it is especially important to sustain remaining native plant communities in a healthy state to support native birds and other wildlife. Concerning the invasion of non-native grasses such as cheatgrass, they recommend the use of herbicides as a tool to help in maintaining sagebrush.

The adverse effects associated with the ingestion of contaminated food items by small avian insectivores ranged from no risk to low risk in acute and chronic exposure scenarios at typical application rates for nine of the ten the herbicides proposed for use (Table 6). High risk to small avian insectivores is associated with 2,4-D. However, as identified previously, Brewer's sparrow tend to prefer habitat away from roads and therefore would likely not forage near treated roads at a level that would lead to negative impacts.

Western Ground Snake – There could be limited mortality to this or other snake species from project implementation but most snakes would be expected to move away from oncoming tractors. Additionally, implementation of proposed actions would likely begin in late September when snakes in the Northern Great Basin are beginning to concentrate near winter dens in rocky areas that would not be treated and implementation would be terminated before snakes emerge from dens in the spring.

Greenstripping – The areas where greenstrips would be maintained or created would not degrade habitat for this species or its prey. There would be minimal amounts of sagebrush disturbed.

Mowing – Some loss of canopy cover from mowing would occur, but there would still be cover present with 6" to 12" of shrub stubble, mowing debris, and grasses and forbs. Mowed areas

may attract some prey species, especially for the snakes that feed on mice, chipmunks, and ground squirrels.

Application of Herbicides – Little is known about the risks of adverse effects to reptiles from herbicide exposure; however, the overall risk is expected to be low. Most snakes would attempt to escape from approaching vehicles or workers, often by seeking refuge in burrows (USDI 2007c). Because most snakes would move away or seek refuge in burrows, most would not be exposed directly to herbicides. While there is the possibility that a reptile could ingest prey contaminated by herbicide, the level of risk is low because the prey species would also be expected to move away from vehicles or workers. The western ground snake is mainly nocturnal making the risk of direct contamination negligible. Adhering to the standard operating procedures for herbicide application would also reduce the possibility of adverse effects.

Pygmy Rabbit – Surveys for the presence of pygmy rabbits were completed during summer 2011. Surveys involved walking and looking for burrows in potential habitat, as defined by Ulmschneider et al. (2004) in potential treatment areas. Trail cameras were also used to determine if burrows were active, which has been shown to be the most effective method for documenting presence of pygmy rabbit (Larrucea and Brussard 2008a). Areas where active burrows were identified and ecological sites identified as potential habitat would be resurveyed one week before treatment to determine if burrows are still active or if new burrows are present. Potential habitat may be impacted but the area was surveyed and active pygmy rabbit burrows would be buffered 50' from mowing. Burak (2006 p. 83) documented that pygmy rabbits utilize low sagebrush sites in their home range. While the 50' buffer would be on both sides of the burrow and extend back to un-mowed shrub cover to provide a travel corridor without open areas, Burak's (2006) documentation of pygmy rabbits use of low would indicate that they would not be adverse to utilizing or travelling across mow strips.

Seventeen burrow sites were located during the surveys; all were in the ecological site loamy 13-16 inches, with vegetation dominated by mountain big sagebrush, bluebunch wheatgrass, and Idaho fescue. Distribution of pygmy rabbits within the project area is closely tied to one ecological site, which correlates closely to where rabbits have been found throughout southwestern Idaho during other surveys. Other ecological sites that may support pygmy rabbits include areas with a precipitation range of 12 to 16 inches with mountain and Wyoming big sagebrush species and an understory of Idaho fescue and bluebunch wheatgrass, and dry meadow areas with an understory of Sandberg bluegrass, and mountain Timothy. While these ecological sites were surveyed, no rabbits were detected.

Greenstripping – Greenstripping would not involve removal of suitable sagebrush habitat; and most greenstrip areas would basically remain the same. Over time (30-60 years), successful greenstrips would allow sagebrush to re-establish in interior areas that have lost sagebrush from frequent burning.

Mowing – Fourteen miles of mowing is proposed in the ecological site that supports pygmy rabbits in the project area. The mow would reduce sagebrush cover over approximately 170 of the 14,227 acres, or 1.2%, of that ecological site in the project area.

Wilson et al. (2011) studied the effects of sagebrush treatments to pygmy rabbits in patches varying from 12 to 138 acres. They did not observe that treatments affected the general placement of pygmy rabbit home ranges, and that limiting treatment placement, by creating large no-treatment buffers, may be unnecessary. Treatments near occupied pygmy habitat should be small, narrow, and widely spaced. They further recommend that, in lieu of islands of intact sagebrush in a matrix of treatments, treatment mosaics should more closely resemble islands of treatment in an untreated matrix. In other words, instead of having many small patches of sagebrush, five to ten acres for example, surrounded by hundreds of acres of treated sagebrush, it should be reversed so that small areas of treated sagebrush are surrounded by large areas of untreated sagebrush.

The proposed action follows guidelines identified in this research. The BLM would buffer occupied habitat, and mow strips would be narrow, small (area actually treated in a square mile), and widely spaced across the landscape. The proposed treatments would also have treated areas surrounded by large areas of untreated sagebrush stands. Effects from the proposed action would be minimal, due to project design, small percentage of suitable habitat impacted, and surveys in preferred habitat would be completed, within one week before treatment, to identify new burrows. Active burrows would have 50-foot buffers.

Application of Herbicides – In September 2010, the USFWS published its 12-month Finding for pygmy rabbit (USFWS 2010b). The USFWS determined that the use of herbicides occurring on federal lands as regulated by various policies, guidance, and laws, was not significantly impacting pygmy rabbits. The pygmy rabbit diet consists of 99% sagebrush during the winter and approximately 51% sagebrush, 39% grasses, and 10% forbs in the summer (Utah Division Wildlife Resources 2003). Pygmy rabbits can be active at any time of the day, but activity levels appear to increase from dusk to dawn. Activity is likely influenced by climatic conditions such as temperature, wind, and precipitation (Keinath and McGee 2004). At a study site in Idaho, daily, above-ground activity levels peaked in May and August, with lows in July and December – January (Bradfield 1974).

Acute exposure from direct spray is highly unlikely due to the species' tendency to flee to its burrows when disturbed. However, the pygmy rabbit diet consists of approximately 39% grasses during summer months and 2,4-D has moderate to high risk levels of acute contamination when grasses are consumed. Therefore, it may be expected that application of 2, 4-D may result in moderate to high risk of exposure for some rabbits. To reduce the potential for pygmy rabbits to experience acute exposure to 2,4-D, the following stipulations for application of 2,4-D would apply (See also Project Design Features p. 18):

- No use of 2,4-D within 1/4 mile of active burrows.
- No application of herbicides (not including 2,4-D) above the typical application rate would occur within 100 yards of active burrows from one hour before sunset to one hour after sunrise, to minimize the chance of direct contamination.
- Application of herbicides other than 2,4-D would be applied using a backpack sprayer within 100 yards of active burrows.

Due to the project design features identified for use of 2,4-D and other herbicides near active burrows, and based on the information provided above and on pages 45 - 48, the risk to this species from application of herbicide would be low.

Pronghorn Antelope – Pronghorn would be temporarily disturbed by project implementation, but would benefit from the habitat changes. Mowing sagebrush does reduce winter habitat for ungulates (Davies et al. 2009), however the amount of habitat impacted by the proposed action would have negligible impacts to wintering ungulates in the project area. In contrast, impacts from burning thousands of acres of quality habitat away from roads would potentially have severe impacts to wintering ungulates that would last for decades.

Greenstripping – Seed selection for greenstrips would include site-appropriate species and of value to ungulates. A reduction of non-native annuals would result, benefitting desirable plant species and animals that utilize them as forage. Greenstrips would reduce the likelihood of fires crossing roads and burning through large grass stands. Reducing fire across the landscape would augment sagebrush establishment to provide future pronghorn cover. Sagebrush establishment could take 30 to 60 years or more.

Mowing – This action would reduce cover in the 100-foot wide area near roads; however, this would have no measurable effect on pronghorn. They are sensitive to traffic and flee by running away from approaching vehicles. There would still be vast areas available for fawning when sagebrush cover is needed. The mowing may increase desirable forage, including forbs and grasses.

Application of Herbicides – Pronghorn have hundreds of thousands of acres of habitat in the BFO, and the area proposed for herbicide treatment is a minute fraction of that available habitat. The likelihood of pronghorn foraging for an extended period of time within the treatment areas is very low. The greatest risk would be from 2,4-D. Based on this information and the information presented on pages 45 – 48, the risk from application of herbicides to this species is low.

3.3.2.3 Alternative C

Greenstrips provide greater effectiveness in controlling wildfire, but they alter a greater number of wildlife habitat acres. The vegetation community would be altered by replacing existing shrub communities along roadsides with low growing or fire resistant vegetation in swaths of 300 feet (150 feet on each side or 300 feet on one side). The amount of sage steppe habitat established to greenstrips would be 36 acres/mile for 73 miles or 2,654 acres. Roadside vegetation within the greenstrip would be replaced with species known to be effective fuel breaks and able to successfully establish in a given soil type and precipitation regime. Overall, there would be an increase of 1,539 acres of sage steppe habitat alteration when compared to the proposed action. Treatment widths would be three times greater than the proposed action and this alternative may require more temporary fencing to protect greenstrips from livestock while the seeded vegetation becomes established. Fence building would follow guidelines and management direction identified in BLM IM 2012-043.

Application of herbicides would occur over the 87 miles (3,127 acres) of greenstrips being developed. This would reduce competition with undesirable greenstrip species and enhance the

establishment of functioning greenstrips. It is unknown how many miles of existing greenstrips would require herbicide treatment but for this analysis we assume that the entire 42 miles (1,527 acres) would be treated even though the actual miles treated may be much less. The total amount of acres that could be treated with herbicides is 4,654, which is 1,612 acres more than the proposed action.

The risk of adverse impacts from application of the herbicides proposed for use is discussed in Alternative B on pages 46 and 47. There would be greater risk of adverse effects with Alternative C due to the increase of treated acres. However, the proportion of treated acres compared to the available acres of habitat within and surrounding the project area is still minimal. While the risk of adverse effects to wildlife due to contamination from the proposed herbicide treatment is greater in Alternative C, the likelihood of negative effects occurring is still low. The determination of low risk is based on the following rational:

- Harmful doses of herbicide are not likely unless the animal forages exclusively in the treatment area for an extended period of time and the likelihood of animals spending large amounts of time foraging in fuel breaks is low due to reduced cover, treatments are adjacent to roads, and the vast amount of suitable habitat that is located away from roads.
- The predictions of potential adverse effects from herbicides are overly conservative in that they assume 100% of the animal's diet would consist of contaminated vegetation, which would be unlikely unless the animal's entire habitat was treated (USDI 2007c).
- The number of acres treated in the project area is minimal when compared to the acres of suitable habitat within and surrounding the project area.
- Application would be applied under 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 (PEIS) (USDI BLM 2007a, Appendix B).
- Herbicide treatments would be target undesirable vegetation. Reduction of noxious weeds and invasive annuals would improve habitat conditions for wildlife.

Ferruginous Hawk – Negative impacts to this species would be negligible. Other than temporary disturbance, ferruginous hawks would benefit from the proposed action by reducing the likelihood of large wildfires. Additionally, small mammal populations, such as jackrabbits and squirrels, may increase in the seeded areas (Fagerstone et al. 1980).

Greater Sage-grouse – There would be more sage-grouse habitat impacted by establishing greenstrips throughout the project area, as compared to Alternative B. Treated roadsides would be 300 feet wide (150 feet on each side or 300 feet on one side), and planted with fire resistant or low stature vegetation. A three hundred foot wide fuel break would likely lead to restricted use nearer to roadsides. Greenstrips would be representative of R1/perennial grassland habitat (Table 5), which is a habitat type that sage-grouse use. Sage-grouse would be expected to forage closer to sagebrush edges, which would be 150 feet from roadsides and that could benefit sage-grouse by reducing disturbance from vehicles and reduce hunter success. Seasonal restrictions for project implementation would protect sage-grouse from disturbance during lekking, nesting, and early brood rearing. Temporary fencing would have a higher likelihood of impacting sage-

grouse because the greenstrips would be developed in areas with higher concentrations of sage-grouse.

There would be approximately 3,491 acres (36.36 acres/mile) of key sage-grouse habitat impacted by development and maintenance of greenstrips or 1.6% of the key habitat in the project area and 0.3% of the key habitat in the BFO (Table 9). There would be approximately 2,763 acres of preliminary priority sage-grouse habitat impacted by development and maintenance of greenstrips or 1.5% of the preliminary priority habitat in the project area. While this treatment would lead to greater habitat alteration acres near roads, when compared to Alternative B, it would provide better protection for large, intact sagebrush habitat. Greenstrips would provide greater possibility of successfully holding fire within treated areas and keeping fires small, which would benefit sage-grouse.

Table 9. Alternative C: Miles of treatment in sage-grouse habitat types

Habitat Type	Mowing	Greenstrip Develop	Greenstrip Maintain
Key	0	75	4*
Perennial Grassland (R1)	0	12	28
Annual Grassland(R2)	0	0	9
Total Miles	0	87	41

*This key habitat is in an existing fuel break and is being maintained. These acres are not included in key habitat acres altered.

Brewer's Sparrow – The treatment would lead to a loss of approximately 3,491 acres of sagebrush habitat for this species.

There would be negative impacts to this species from the extent of habitat alteration. Impacts must be weighed against the loss that would occur from a large fire, which could have far greater impacts, i.e., 3,491 acres versus the ≈157,573 acres burned in 2010 and 2011. While there would be habitat loss, the objective is to protect thousands of acres for a more imperiled species (sage-grouse); which, in turn, would benefit Brewer's sparrow.

Western Ground Snake – There would be no direct effects from greenstrip establishment because implementation would likely begin in late September when snakes, in the Northern Great Basin, are preparing to enter winter dens and likely near rocky den sites. Greenstrips would not reduce prey species or habitat suitability for this or other snake species.

Pygmy Rabbit – There would be a loss of sagebrush cover over approximately 509 of the 14,227 acres, or 3.6%, within the ecological site where rabbits were found. This is an increase of 339 acres when compared to the proposed action. Effects from the proposed action would be minimal, due to project design, small percentage of suitable habitat impacted, and additional surveys in ecological sites that may support pygmy rabbits would be completed within one week before treatment to identify new burrows. Active burrows would have 50-foot buffers.

Pronghorn Antelope – Since pronghorn prefer open sagebrush and grassland habitats, there would be no direct effect except temporary disturbance. The greenstrips would benefit

pronghorn by increasing grass and suitable forb species within the treated areas. There would be a reduced risk of large scale fire. Greater amounts of winter habitat for other ungulate species would be altered, with the greatest impact to mule deer that feed extensively on sagebrush. The greenstrips would provide some forage versus a large scale fire that could lead to widespread habitat loss for several years.

3.3.3 Cumulative Impacts

The scope of cumulative effects varies by wildlife species; therefore, the scope is discussed by species. Past actions that have occurred in the analysis area are listed on pages 22 and 23. The temporal scope of analysis for the proposed action would be five years following treatment. It is expected, based on observations of wildlife response to similar treatments in eastern Oregon (Michael McGee, Personal Observations), that wildlife would not avoid treated areas and there may not be any adjustment period necessary.

The cumulative impacts scope of analysis for Alternative A in conjunction with a large fire event would include the project area and the surrounding burned habitat. An exact boundary for scope of analysis would be speculative, due to variable conditions resulting from and unknown size of future fire events. Cumulative impacts from past, present and foreseeable actions, in conjunction with large fire effects, as described in the environmental effects, would occur if the impacts degraded habitat in and near the burned area. This scope of analysis does not apply to sage-grouse, Brewer's sparrow, and pygmy rabbit.

Cumulative effects for Brewer's sparrow and pygmy rabbit are considered the same as those for sage-grouse. Recent literature supports the idea that because of the broad range of sagebrush habitats used by the sage-grouse on the landscape, it can be considered as an umbrella for other sagebrush obligate or associated species (Hanser and Knick 2011). The scope of analysis for sage-grouse differs from the other wildlife analyzed in this EA (Map 8). The analysis area for Brewer's sparrow and pygmy rabbit does not need to extend to the same magnitude as sage-grouse, but the effects of fire and actions that would impede recovery of suitable habitat following fire would have similar negative cumulative effects to all of these species. Sage-grouse in and near the project area are migratory and recent data analysis of sage-grouse tracked by IDFG from April 2002 through December 2011 showed that birds travelled an average of 17.4 miles annually (sexes, ages, and years combined; BLM 2011). Those IDFG data represent the greatest straight line distance from the earliest location during the breeding period to all subsequent locations within an annual cycle and only data from birds characterized with information spanning breeding through winter seasons were used. The greatest distance documented for a single bird from the project area was 42 miles. The cumulative effects analysis area for sage-grouse begins at the project boundary and extends outward for 52 miles to include all areas of preliminary priority and general habitat in Idaho, several thousand acres of core habitat in eastern Oregon, and several thousands of acres of important and essential habitat in Nevada. Core habitat in Oregon and important and essential habitat in Nevada are synonymous with preliminary priority habitat in Idaho. This analysis area was determined to be sufficient because:

- The furthest movement of a sage-grouse near the project area, documented from over nine years of telemetry surveys, was 42 miles. This 42 mile distance was then buffered by broadening it an additional 10 miles to include potential outliers.

- This area incorporates all seasonal habitats identified for sage-grouse in the project area,
- Knick and Hanser (2011 p. 403) 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 exceeds the premise that landscape characteristics at a 34 mile (54km) radius may influence sage-grouse seasonal movements and incorporate habitats used outside of the breeding season (Knick and Hanser 2011, pg 386; Leonard et al. 2000).

Additionally, because the analysis area is larger for sage-grouse, there are a greater number of actions occurring across the landscape and more actions are analyzed in the sage-grouse cumulative effects section for Alternative A.

3.3.3.1 Alternative A

By not implementing the proposed action, habitat would remain at risk and the ability to successfully control wildfire would not be enhanced. Since control of wildfire would not be enhanced, cumulative impacts analysis for this alternative are analyzed in relation to how past, present, and future actions would affect habitat recovery after a fire. Effects from large fire to each species being analyzed were previously discussed in the environmental effects and will not be re-stated here.

Ferruginous Hawk –
Livestock Grazing and Trailing – Sagebrush habitat provides necessary cover for jackrabbits and other important prey items for ferruginous hawk. Depending on the level of grazing, effects from the reduction of cover and forage from grazing have varied across the landscape. Impacts to 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 ferruginous hawks 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 below; 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 can be avoided.

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

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

Power line Maintenance – Maintenance actions would not cause measurable cumulative impacts due to their short duration and limited area impacted. Power lines would be repaired before the burned area recovered enough to provide suitable habitat. Additionally, power lines provide nesting sites for ferruginous hawks, especially when platforms are installed, such as those along Baja Road on the Boise District.

Greater Sage-grouse, Brewer's Sparrow, and Pygmy Rabbit – As mentioned above, because the analysis area is much broader for sage-grouse compared to other species in this analysis, the cumulative effects analysis covered more actions including wildfire, energy development, recreation, juniper (conifer) control, and urban development.

Wildfire – Past wildfires have destroyed millions of acres of sage-grouse and sagebrush obligate species' habitat across the west. This loss of habitat has led to reduced populations for some species, especially as cheatgrass and other invasive annuals have become more prevalent. Fire is considered the biggest threat to the sagebrush ecosystem in southern Idaho and throughout much of the range of sage-grouse in Oregon, Nevada, and Idaho. Large wildfires are predicted to increase in the west as a result of trends in climate change (Baker 2011). Future wildfires would lead to greater habitat loss and stress on sagebrush obligate species including sage-grouse.

Livestock Grazing and Trailing – Suitable sage-grouse habitat takes many years to reestablish after being destroyed by fire. Sometimes there is no recovery, due to establishment of non-desirable vegetation and altered fire regimes. There are differing views on the impacts of grazing in recently burned areas. Bates et al. (2009) found no difference between grazed and ungrazed plots after a low severity, fall season prescribed fire. The fire in their study caused minimal, if any, mortality to perennial bunchgrasses 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 that 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 that "if livestock have premature access to a burned area, negative impacts to vegetation recovery may result unless management of the livestock occurs" (Bunting et al. 1987). They also identify that the amount of non-use necessary after a fire varies considerably with the vegetation composition, site conditions, and objectives of recovery (Bunting et al. 1987). Grazing typically resumes within two growing seasons after a fire. Post-fire management of livestock, both short and long-term, is essential for long-term maintenance of desired sagebrush canopy cover and herbaceous understory (Wyoming Interagency Vegetation Committee (WIVC) 2002, pp. 19-20). The WIVC guide (2002) indicates that 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 that was not managed to promote the recovery of sagebrush with the appropriate herbaceous understory would have negatively impacted sage-grouse and sagebrush obligate species. Cumulative effects of livestock grazing would occur if future burned areas are not allowed an adequate period of rest and if grazing is not properly managed.

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

Noxious Weed Treatment – Treatments would reduce the spread of noxious weeds that would compete with desirable vegetation trying to re-establish following fire. Noxious weed treatments

would benefit the recovery of burned areas. There would be no negative impact from treatment of noxious weeds in burned areas across the analysis area.

Energy Development, Electrical Transmission, Power line Maintenance, Communication Towers – Of the sagebrush obligates grouped in this analysis; sage-grouse would be impacted most by energy development and communication towers. Power lines and communication towers can lead to direct mortality of sage-grouse from collisions with wires. Structures also provide perching sites used by sage-grouse predators. Associated with energy development is the network of roads that is constructed. It is apparent from the scientific evidence that past and present energy development degrades habitat and is impacting sage-grouse populations (Naugle et al. 2011 p. 500).

The BLM has been working on an EIS for a wind development project on China Mountain, which is in Jarbidge FO in Idaho and the Wells FO in Nevada. The proposed action is for the development of up to a 425 megawatt wind energy facility. The applicant's proposal consists of up to 170 wind turbines, 83 miles of all-weather gravel roads, 19 miles of overhead electric transmission line, up to 3 permanent meteorological towers, 3 electric substations, and 2 operation and maintenance facilities. The project area consists of the 30,700-acre area ROW preference area. This decision for this project was recently deferred until completion of the Idaho/Montana sub-regional sage-grouse EIS/Resource Management Plan amendments and Jarbidge Resource Management Plan revision.

Gateway West is a proposal to construct 1,103 miles electrical transmission lines from Glenrock, Wyoming to Hemmingway Butte in Idaho. The preferred or proposed route for the power lines crosses through 50 miles of key and 54 miles of R2 (perennial grassland) sage-grouse habitat in Idaho. None are crossed in the project area. Several alternative routes are identified some of which could reduce the miles of suitable habitat impacted.

Any future communication towers or energy infrastructure constructed using current design methods would degrade habitat for sage-grouse and most sagebrush obligate species through the analysis area. This loss or degradation of habitat when added to the effects of fire would lead to long-term cumulative impacts.

There are several power lines throughout the analysis area for sage-grouse. Power line maintenance is usually of short duration but could impact sage-grouse lek behavior if work were to begin before 9:00 AM (ISAC 2006) and nesting hens could be disturbed by maintenance activities through June. However, in the event of a large wildfire, power lines would be repaired before the burned area recovered enough to provide suitable habitat for these species so there would not be cumulative effects from maintenance activities associated with wildfire. Cumulative impacts to Brewer's sparrow and pygmy rabbits would not occur because power lines are not a habitat limiting structure for these species and maintenance actions would be limited in duration.

Recreation – Of the recreational activities that occur on public lands, sage-grouse hunting and OHV riding pose the biggest threats to habitat and population numbers. Sage-grouse hunting still occurs throughout the analysis area. Off-highway vehicle (OHV) within the project area and

through much of the analysis area is low but there are areas with high levels of use in suitable sage-grouse habitat. Most areas of high OHV use occur near population centers, such as the Murphy OHV area, which is used heavily by people living in Boise and surrounding cities. OHV use is higher in the more remote areas during the fall hunting seasons but this limited period of use appears to have minimal impacts. There are no positive effects to sage-grouse from hunting or OHV use and these activities have and continue to have negative impacts to sage-grouse.

Hunting of sage-grouse is a direct reduction to the sage-grouse population and reproductive potential throughout the analysis area. The ten year average for annual sage-grouse harvest in southwest Idaho is 1,445 birds (IDFG 2010). As more and more suitable sagebrush habitat is destroyed by fire across the analysis area, the greater the impact hunting would have on maintaining viable populations and the possibility of sage-grouse expanding their range as habitat recovers from fire. Hunting would have cumulative impacts in association with the loss of suitable habitat from large wildfires.

As levels of recreation increase across public lands, in particular OHV use, pressures on wildlife and their habitat would continue to increase. Areas that are remote with suitable sage-grouse habitat and low levels of OHV use will increase in their importance to sage-grouse persistence as areas with high levels of OHV would continue to have degraded habitat. Effects from OHVs include disturbance from noise and presence, causing abandonment of suitable habitat (extirpation), and fragmentation of habitat. Off-highway vehicles can cause direct mortality through collisions and indirectly from wildlife collisions with fences installed to control use (BLM 2009; Aldridge and Brigham 2001). Impacts from OHV use in conjunction with habitat loss from fire would lead to cumulative impacts to sage-grouse and sagebrush obligate species.

Juniper Control Projects – Juniper control has been ongoing at the mid- and broad scale levels in various locations throughout the Northern Great Basin including the Boise District BLM (i.e. Castle Creek). This is because juniper has been encroaching into sagebrush steppe across millions of acres throughout the west, which has led to the loss of thousands of acres of sage-grouse habitat. The Upper Castle Creek Project has treated on approximately 17,027 acres, which is far fewer than the acres that have burned in recent years. These projects would likely continue to be implemented to maintain and restore sagebrush steppe habitat with a focus on areas that would benefit sage-grouse. Effects of this action and large fire would not be cumulative because the effects of restoring and maintaining habitat are positive and would help offset the losses that occur from fire throughout the analysis area.

Fuel Break Development – The Twin Falls District of the BLM is proposing to develop 166 miles of fuel breaks in the Jarbidge FO. These fuel breaks would likely be greenstrips 400 feet wide, 200 feet on each side of a road in areas that are occupied by vegetation that readily burns during the peak of fire season. There is little sage-grouse habitat in the area of their proposed fuel breaks, most of it being destroyed by large wildfires. Since there would be minimal loss to sage-grouse habitat, there would be no cumulative effects with the proposed action.

Human Development – Sagebrush steppe habitat lost to agriculture, rural, and urban development is occurring to some degree across the area. Human development in sagebrush steppe would be

cumulative to sage-grouse, Brewer's sparrow, and pygmy rabbit with loss of suitable habitat from fire throughout the analysis area, although human development in the remote portions of the area is minimal.

Western Ground Snake –
Livestock Grazing and Trailing – Livestock grazing and large wildfire would not be expected to cause cumulative effects to this species if grazing is restricted for at least two growing seasons and sufficient cover has re-established.

Noxious Weed Treatment – **See**: Ferruginous Hawk.

Power line Maintenance – Maintenance actions would not cause measurable cumulative impacts due to their short duration and limited area impacted.

Pronghorn Antelope –
Livestock Grazing and Trailing – Since pronghorn are primarily a forb-eating species with strong requirements for open cover; they are favorably influenced by the increase in herbaceous species and shrub reduction following fire (Higgins et al. 1989). Cattle prefer and primarily consume grass. Livestock grazing and trailing after wildfire would have minimal impacts to the forage that pronghorn prefer. There would be no cumulative impacts from these actions to pronghorn antelope.

Noxious Weed Treatment – **See**: Ferruginous Hawk.

Power line Maintenance – Maintenance actions would not cause measurable cumulative impacts due to their short duration and limited area impacted.

3.3.3.2 Alternative B and Alternative C

Ferruginous Hawk, Western Ground Snake, and Pronghorn Antelope – Because there are no direct or indirect impacts from project activities to these species, no cumulative effects would occur.

Greater Sage-grouse, Brewer's Sparrow, Pygmy Rabbit – The environmental analysis of the action alternatives determined that effects to sage-grouse, Brewer's sparrow, and pygmy rabbit would be negligible. The reasons there would not be measurable effects to these species from either action alternative include the following:

- The minimal amount of key (sagebrush habitat used by Brewer's sparrow and pygmy rabbit) and preliminary priority habitat impacted relative to the amount available in the project area;
- Treatments are adjacent to roads;
- Actions include design features that protect habitat and important life history activities for these species.

Therefore, implementing Alternative B or C in combination with current and foreseeable projects would not cause measurable negative cumulative impacts to sage-grouse or other sagebrush

obligate species beyond what any of the actions cause on their own. As identified in the environmental effects analysis, the proposed action would impact 0.5% of the key/preliminary priority habitat in the project area. In the analysis area, the sum of Idaho's key habitat, Oregon's Core habitat, and Nevada's Essential and Important habitat is 4,157,459 acres. The percentage of key/preliminary priority habitat impacted in the project area compared to the amount of those four habitat classifications (basically the same as preliminary priority habitat) in the cumulative effects analysis area for sage-grouse would be 0.02%.

3.4 Soils

3.4.1 Affected Environment

Soil information is derived from the Soil Survey of Elmore County Area, Idaho, Parts of Elmore, Owyhee, and Ada Counties, Idaho (NRCS, 1991) and Soil Survey of Owyhee County Area, Idaho (NRCS, 2003). Major landforms within the project area include dissected piedmonts and terraces in the northeastern section, and foothills, structural benches, and tablelands in the remainder of the project area. Common soils are Shoofly-Ornea-Abgese on alluvial plains and fan terraces, Typic-Torriorthents-Mazuma-Vanderhoff on dissected terraces, Willhill-Dougal on foothills and structural benches, Wickahoney-Monasterio-Yatahoney on foothills, tablelands and structural benches, Bruncan-Troughs-Snowmore on calderas, tablelands and structural benches, and Arbidge-Bedstead-Buncelvoir on calderas, tablelands, and foothills.

The northeast region of the project area is the lowest in elevation. Typical soils in this region formed from mixed alluvium and loess, soil depths range from moderately deep to very deep and are well drained to excessively drained. Surface soil textures range from loams and silt loams to sandy loams. Soils in the remaining regions of the project area generally formed in residuum and slope alluvium derived from welded rhyolitic tuff. Soil depths are generally shallow to moderately deep and well drained. Surface soil textures range from loam to silt loams with varying amounts of rock fragments.

The wind erodibility indexes for soils in the project area have low to moderate ratings. This index is closely linked to surface layer texture, size and durability of surface clods, percentage of rock fragments, organic matter and calcareous reaction (Soil Survey Staff, 2011). Biological soil crusts are common on soils throughout this region and provide additional resistance to erosion.

3.4.2 Environmental Consequences

3.4.2.1 Alternative A

Under this alternative the increased potential for large scale and more frequent wildfires could lead to exposed soil and increases in invasive annual plants. Annual plants would provide limited soil protection from wind and raindrop impacts. Annual plant roots are not as extensive as perennial plants and thus do not provide the same soil holding capacity and resistance to soil movement. Annual plant roots also do not provide the same level of organic matter and porosity as perennial plants, which allow deeper infiltration of moisture.

3.4.2.2 Alternative B

Mowing equipment could create localized and short-term disturbance to soil surfaces and biological crusts. The disturbance effects would be confined to structural breakdown of soil aggregates and biological soil crusts from tires. Mowing would not remove vegetation; therefore, erosion would not be expected to increase. These effects are expected to be inconsequential and not long-term.

Drill seeding equipment would disturb soil approximately 2 to 4 inches deep creating more pronounced disturbance to the soil and biological soil crusts than mowing. Drill seeding would generally occur in areas previously disturbed during emergency fire rehabilitation treatments or where invasive annual grasses are dominant. Only a very small percentage of the proposed greenstripping would occur in native plant communities. The establishment of the herbaceous perennial plants in the greenstripped area could require subsequent seedings to ensure a functional fuel break. Multiple passes would create more disturbance than a single pass.

3.4.2.3 Alternative C

The effects described from drill seeding in Alternative B would occur throughout the proposed treatment area. Additional disturbance under this alternative would result from removing existing native plant communities, especially if removal is accomplished by plowing or disking. Prescribed fire would have less impact to soil than plowing. Effects from prescribed fire would be confined to the release of nitrogen which favors annual plant growth. Altering the structural composition of the plant community from shrub/grass to grass could alter the ability of those areas to retain snowfall which increases infiltration; however on a landscape scale this effect would be very minimal.

3.4.3 Cumulative Impacts

The area directly affected by the proposed actions accounts for approximately 0.7 percent of the project area; therefore the spatial scale for cumulative impacts is confined to the project area. The temporal scale for cumulative impacts to soil is 10 years; which includes the time during the phased in implementation which is expected to be approximately 5-10 years. Of the actions identified for consideration of cumulative effects, livestock grazing and recreation have shown to have the most potential for impact. Since 2010, approximately 101 miles of dozer line was created in efforts to contain wildfires. This impact, although effective, results in long-term soil disturbance and exposure.

Recreation impacts are largely from dispersed activities and with the phased in implementation of the project, no cumulative impacts would be expected. Soil impacts from livestock grazing would largely be dispersed, although concentrated impacts occur especially near gates, water troughs, mineral supplementation sites, and where trailing occurs. The impacts from livestock grazing, recreation, and fuel break construction and maintenance would not be expected to have cumulative impacts to the soil resource in the project area. More disturbances would occur, as a result of creating and maintaining fuel breaks (Alternative C) than mowing, creating, and maintaining fuel breaks under Alternative B.

3.5 Livestock Grazing Management

3.5.1 Affected Environment

The BLM authorizes livestock use on eleven (11) grazing allotments within the project area (Map 9). The following table provides a summary of permitted livestock use by allotment.

Table 10. BLM allotments in the project area

Allotment Name/ Number	BLM Acres	Permittee(s)	Number and Kind of Livestock	Season of Use	AUMs[2]
Blackstone 00941	72,397	Strickland YT Ranches, Inc.	198 Cattle	12/8 – 2/28	540
			198 Cattle	3/1 – 4/4	228
			416 Cattle	4/5 – 6/5	848
		Tom & Carmen Buckingham	56 Cattle	4/8 – 6/5	109
			56 Cattle	6/6 – 8/10	122
			46 Cattle	8/11 – 11/15	147
Center 00809	64,038	JR Simplot Company/Battle Creek	446 Cattle	11/1 – 3/25	2,126
		Les & Leona Hatch	269 Cattle	11/16 – 5/31	1,742
China Creek 00883	33,450	Les & Leona Hatch	193 Cattle	5/1 – 11/30	1,352
			21 Cattle	5/1 – 11/30	102
Crab Creek 00841	7,242	Tindall & Sons Ranches LLC	191 Cattle	3/15 – 4/20	232
East Canyon View 00869	4,283	JR Simplot Company/Battle Creek	218 Cattle	3/1 – 3/31	222
			218 Cattle	11/1 – 2/28	860
Louse Creek 00842	12,878	Tindall & Sons Ranches LLC	220 Cattle	3/1 – 4/20	369
			220 Cattle	1/1 – 2/28	427
Miller Table Seeding 00812	6,158	JR Simplot Company/Battle Creek	223 Cattle	11/16 – 2/24	740
Northwest 00808	193,060	David Lahtinen	203 Cattle	4/1 – 5/31	408
		Chester Sellman	113 Cattle	4/1 – 5/31	227
		Dickshooter Cattle Company	1429 Cattle	3/1 – 8/1	7,235
			22 Horse	3/1 – 8/1	111
			1451 Cattle	8/1 – 8/31	1,479
			301 Cattle	9/1 – 11/30	901
			1058 Cattle	12/1 – 2/28	3,131
		Craig Gillespie	48 Cattle	4/1 – 11/30	385
		John B. Urquidi	50 Cattle	4/1 – 5/31	100
Owens 01348	22,475	David Lahtinen	204 Cattle	6/1 – 7/15	302
			204 Cattle	7/16 – 9/30	516
		Chester Sellman	113 Cattle	6/1 – 7/15	167

[2] Animal Unit Month: means the amount of forage necessary for the sustenance of one cow or its equivalent for a period of one (1) month.

Allotment Name/ Number	BLM Acres	Permittee(s)	Number and Kind of Livestock	Season of Use	AUMs[2]
			113 Cattle	7/16 – 9/30	286
		John B. Urquidi	66 Cattle	6/1 – 7/15	98
			66 Cattle	7/16 – 9/30	167
Table Butte 00812	30,976	JR Simplot Company/Battle Creek	223 Cattle	11/16 – 2/24	740
West Canyon View 00811	3,353	Dickshooter Cattle Company	203 Cattle	3/1 – 4/30	407
			201 Cattle	11/1 – 2/28	793

The permitted use shown in the above table includes movement of livestock between pastures of an allotment. In addition, the BLM authorizes trailing across BLM lands for access to other allotments through separate permits. They include a route used by Dave Lahtinen and Chet Sellman in fall to exit their permitted use area in Owens Allotment, which coincides with a short segment of the proposed mowing treatments within the Northwest Allotment. An alternate spring trailing route for Joseph Black & Sons within the Northwest Allotment coincides with a longer segment of proposed mowing treatments, and a potential trailing route along the CCC (Civilian Conservation Corp) road that may be authorized in the future coincides with several segments of the greenstrip maintenance treatments. If trailing were to be authorized along this route, it would occur only during the dormant season (i.e., fall or winter). The trailing permits stipulate that "livestock trailing on routes in or adjacent to, burned areas that have been temporarily closed to grazing will be kept on the route (within 50 feet of the route)". This would also apply to livestock trailing on routes in or adjacent to vegetation treatment areas until treatment objectives have been achieved "unless the specific trailing event would not conflict with treatment objectives".

During the last three years in the project area, approximately 145,497 acres have burned in 8 of the 11 allotments. Burned areas on public lands are typically closed to livestock use until emergency stabilization and rehabilitation objectives are achieved or until the authorized officer determines that grazing can resume.

3.5.2 Environmental Consequences

In all cases, the Field Manager has the discretion to close or modify portions of allotments or to reroute any coincident trailing events to allow establishment of recently seeded species. Options are generally available to reduce or minimize disruption to ongoing, authorized livestock grazing, within the flexibility offered by the existing grazing and crossing permits. None of the alternatives would result in changes to the mandatory terms and conditions of the livestock grazing permits. In some cases, improved control of use distribution, or temporary changes to the timing of use within the permitted period of use would be adequate to restrict livestock use in the fuel break areas during establishment. Temporary closures would be implemented through documented agreement or through full force and effect grazing decisions (43 CFR 4160.3(f)).

3.5.2.1 Alternative A

Under this alternative, livestock grazing management in the project area would be as shown in Table l0, unless wildfires burn substantial acres in a given allotment, in which case those acres would be closed to livestock use to allow recovery of existing plants or establishment of seeded plants following the fire. In the short-term, temporarily resting burned areas from grazing

disrupts livestock operations. In the long-term, areas that become dominated by cheatgrass following failed seeding treatments or due to repeat fires do not provide reliable forage to sustain the permitted AUMs, especially during periods of drought. Without the proposed fuel breaks, large scale fires, as described in the fuels and fire section (3.1) could burn multiple allotments, potentially resulting in several pastures or allotments closed to livestock concurrently. This scenario would result in more extensive and potentially longer term disruptions to livestock operations than either Alternative B or C.

3.5.2.2 Alternative B

The creation of effective fuel breaks to enhance fire suppression opportunities would be expected to result in smaller fires and consequently reduce the amount of burned areas rested from livestock grazing. Compared to Alternative A, there would potentially be less disruption from wildfires and temporary protective closures associated with fire rehabilitation efforts. Herbicide use within the proposed fuel breaks would have negligible impacts to livestock use due to the limited acres of treatment in comparison to the thousands of acres within the allotments. Timing of herbicide use would be coordinated with the livestock period of use to minimize the potential for impacts to livestock. Maintenance treatments would increase the effectiveness of the fuel breaks, further reducing the impacts of wildfires to livestock operations. Mowing vegetation along roads in shrub communities has the potential to promote drifting snow, which could result in reduced access for livestock management purposes during winter months.

3.5.2.3 Alternative C

Effects of this alternative on livestock grazing management would be similar to those described for Alternative B. In addition, the increase in proposed greenstrip seeding under this alternative, compared to Alternatives A or B would result in increased coordination to restrict livestock use during seeding establishment. Establishing seeded fuel breaks would likely take more time to attain adequate plant density, which would potentially extend the time that livestock would be excluded from the seedings. Several routes currently authorized in crossing permits coincide with proposed locations of new greenstrip seedings (same as those proposed for mowing in Alternative B). The requirement to restrict trailing livestock to within 50 feet of the centerline of the route would restrict effects from authorized trailing to the narrow corridor and not affect the entire fuel break area. Mowing vegetation along roads in shrub communities has the potential to promote drifting snow which could result in reduced access for livestock management purposes during winter months. Herbicide use in this alternative would have the same impacts identified for Alternative B.

3.5.3 Cumulative Impacts

The project area is of sufficient scope for analysis of cumulative effects of past (10 years), present, and foreseeable future actions (up to 3 years) for effects to livestock grazing, because the actual affected area within the project area is so small (0.7%). However, none of the actions listed in Section 3.0 above, would affect livestock grazing in addition to the effects discussed for the proposed action or any of the alternatives.

3.6 Recreation

3.6.1 Affected Environment

Special Recreation Management Areas (SRMAs) are land use plan decisions and designations which intensify management of areas where outdoor recreation is a high priority. It helps direct recreation program priorities toward areas with high resource values, elevated public concern, or significant amounts of recreational activity. The project is not within an SRMA. No Special Recreation Permit applications (commercial use of public lands for guided and/or outfitted activities) have been received in the project area.

Defining recreational opportunities helps recreation managers create and maintain the appropriate experiences that suits various land and visitor types. The recreation opportunity spectrum (ROS) characterizes recreation in terms of setting, activity, and experience. It contains six classes: primitive, semi-primitive non-motorized, semi-primitive motorized, roaded natural, rural, and urban. The ROS classes, in the project area, include roaded natural and semi-primitive motorized. These broad scale settings provide opportunities for non-developed, resource dependent, and dispersed recreation experiences. Common recreational activities include, but are not limited to, big and small game hunting, off-highway vehicle (OHV) use, camping, hiking, nature viewing, and photography. Area visitation occurs primarily in the fall, coinciding with pleasant weather and various hunting seasons.

3.6.2 Environmental Consequences

3.6.2.1 Alternative A

The absence of fuel breaks and mowing under the No Action alternative would not result in any direct impacts to visitor use and experience. However, in the long term there would be an increased potential for more intense and severe wildfires that could affect the recreation experience. Large burned areas would reduce the amount of recreation opportunities in the area and would cause a short to long-term reduction in scenic integrity and visitor enjoyment.

Additionally, dozer lines created during suppression actions are often times utilized by OHV operators, and they can develop into OHV routes.

3.6.2.2 Alternative B

Under the Proposed Action, direct impacts are expected to be minimal. Indirect impacts to the quality of the visitor recreation opportunities may be slightly degraded in the short-term (2-5 years following implementation) from impacts related to scenic integrity expected from manipulation of the vegetation communities (see Visual Resource Management) adjacent to vehicle routes used by the public. Short duration direct impacts (slightly diminished recreational experiences) are possible during project implementation, where area visitors encounter those activities' sights and sounds, i.e., a visitor expecting a primitive, wildlife viewing experience, and it being diminished due to sagebrush mowing equipment.

Mowing shrubs along project area roadsides would not facilitate use outside the current roadway or increase the current width of treated roads. There would be no increase in the use of mowed roadsides (i.e., camping or OHV use) due to the 6" to 12" of tough sagebrush stubble. This stubble would also preclude the roadways from becoming wider as it is not pleasant to drive

across. In contrast, dozer lines do increase off-road use because they resemble trails, even after they have been rehabbed following suppression actions.

Direct effects from herbicide use to recreation resources would not occur. Enhancing and maintaining the effectiveness of the fuel breaks with herbicides would benefit recreation resources and opportunities by reducing the negative effects of large wildfires.

3.6.2.3 Alternative C

Recreation impacts from green-stripping would be similar to those described for Alternative B.

3.6.3 Cumulative Impacts

The project area is of sufficient scope for analysis as it is within a driving distance of 2-3 hours from regional urban centers of Ada and Canyon Counties (Boise, Nampa, Meridian) where recreation visitors are likely to be traveling from. Visitation within an hour of these population centers is slightly greater than the project area and areas over 3 hours from the Boise metropolitan area have very low recreation visitation. Based on traffic data, it is estimated an average of 20 visitors travel routes within the project area per day from May-November with very few visitors during the winter months. Further, it is estimated by the timing of the traffic that only about half of this visitation is recreational in nature. In other words, about half is related to grazing administration and/or natural resource management.

Past, present, and ongoing actions considered to have effects on the quality of recreation opportunities include livestock grazing and livestock grazing management facilities (primarily fences). The foreseeable extent of this land use is expected to continue at current levels.

Five years is an appropriate temporal scale for recreation as many factors including population growth, fuel prices, the regional economy, media coverage, and recreation trends all can influence recreation demand. These dynamics which influence visitor use can be very speculative to predict beyond five years.

There would not be cumulative effects from herbicide use.

3.6.3.1 Alternative A

The potential indirect impacts to recreation opportunities if future wildfire events were larger in size, compared to Alternatives B and C, in combination with past, current, and foreseeable future land uses would not be measurable. It is difficult to quantify impacts to the quality of a visitors experience in much of the project area. However, the quantity of visitor use is thought to decrease in the short term (2-3) after large fire events such as the Jacks Fire of 2012. This observed change results from the lack of wildlife cover after a fire which negatively impacts the quality of hunting opportunities in these areas.

3.6.3.2 Alternative B

The direct effects to visitors include their encounters with the sights and sounds of project implementation. Short possible delays could occur when equipment used for mowing sagebrush and vehicles used by visitors are in close proximity. Visual impacts could be considered as indirect as they relate to the visitor's experience with the project area. A slight negative impact

to the scenic values is expected during the lifetime of the project (20 years). Visual resources effects are also considered a direct impact on scenic resource values. These impacts would conform to visual resource management classes. Analysis of the potential impacts from this alternative to scenic values used the visual contrast rating worksheet (USDI BLM Form 8400-4) to help determine the potential impacts to visual resources. While impacts will vary across the project area, using this process at three locations (key observation points) in the project area resulted in a none-to-weak visual contrast rating for this alternative. In other words, the impacts are thought to be not noticeable to slight. The above-mentioned individual impacts in combination with past, present, and foreseeable future effects are minimal to the quality of recreational opportunities in the project area. The direct impacts of project implementation are of short duration and therefore are likely to impact only a few visitors directly for a brief period of time (up to several minutes). The direct and indirect impacts on visual resources would likely not be noticed to slightly apparent to the visitor.

3.6.3.3 Alternative C

The cumulative effects would be similar to Alternative B.

3.7 Visual Resource Management

3.7.1 Affected Environment

Public lands have a variety of visual resource values. The BLM is responsible for ensuring that the scenic values of these lands are considered before allowing uses that may have adverse visual effects. These different values warrant different levels of management; this is accomplished through the Visual Resource Management (VRM) system. Visual resources are assigned management classes in a land use plan decision. Classes I and II are the most valued, Class III represents a moderate value, and Class IV is of the least value.

The VRM classes in the proposed project area consist primarily of III (72.5 miles of treatments or 50%) and IV (55 miles or 38%). About 18.5 miles (12%) are within Class II areas, primarily along State Highway 51 from Wickahoney Road to Blackstone Road (12 miles) as a ½-mile wide corridor on either side of the highway.

While VRM classes determine the allowable level of visual impacts which may be authorized, inventories represent the most current resource conditions. In 2010, the BFO interdisciplinary team (IDT) conducted a visual resource inventory (VRI) resulting in broad scale classes, according to BLM Manual 8410-H. The project area is entirely within Visual Resource Inventory Class III.

3.7.2 Environmental Consequences

The visual contrast rating system (BLM Manual 8431) provides a systematic means to evaluate proposed projects and determine whether they conform to VRM class objectives. It also provides a means to identify mitigation measures that can be taken to minimize adverse visual effects.

3.7.2.1 Alternative A

There would be no direct effect on the project area's visual resources under the No Action alternative. Wildfire has the ability to severely alter the landscape character through vegetation

loss which, often in sagebrush steppe, does not return to pre-burn conditions. While wildfire will continue to occur, wildfire size would likely be larger than compared to the other alternatives. If this were to occur, the scenic values (patterns and texture) associated with the areas' vegetative diversity would be diminished.

3.7.2.2 Alternative B

Implementation of the Proposed Action alternative would comply with the visual quality objectives for the project area. The Class III VRM would be maintained. The direct effects of wildfire fuel breaks, created by sagebrush mowing, proposed green strips, and maintenance of existing seedings adjacent to motorized routes, would not change the characteristic landscape or dominate the casual observer' view . Vegetation mowing, adjacent to primitive or two-track vehicle routes, would be more visually apparent (noticeable) but less visually sensitive (fewer visitors or viewers) than the mowing of vegetation adjacent to paved roads (State Highway 51) and maintained gravel roads (Wickahoney, CCC, and Blackstone).

A weak degree of visual contrast to the characteristic landscape, within the 12 miles (8%) of VRM Class II along State Highway 51, would be expected, created by mowing vegetation strips, up to 50 feet, paralleling this paved road. Although this area is managed as VRM Class II, it is within the highway and transmission line right-of-way. The proposed project area has been mowed and seeded to crested wheatgrass by the Idaho Department of Transportation.

Weak to moderate degrees of contrast would be expected along the 56 miles (38%) of improved gravel roads within the project area, mostly VRM class III. A weak to moderate degree of contrast is expected from the proposed treatments adjacent to the 80 miles (55%) of two-track vehicle routes, primarily managed as VRM class IV. These would be in conformance with the VRM classes II, III, and IV objectives within the project area.

Project areas identified for green strip development would maintain the characteristic landscape. The visual contrast created in areas proposed for greenstrip maintenance would be minimal (none-weak), as these areas are already located within established seedings. The impacts would be the same over the short- and long–term, since these treatments would be maintained, as needed, for fuel breaks.

Negative effects from herbicide use to visual resources would not occur. Reducing the negative effects of large wildfires would maintain the visual resources found within the project area.

3.7.2.3 Alternative C

This alternative would comply with VRM class objectives and retain the visual inventory class III, if implemented. The direct effects to visual resources would be similar to Alternative B. The degree of contrast would be slightly greater, as compared to Alternative B areas identified for mowing (up to 100 feet wide), as developed green strips are up to 300 feet.

Herbicide use in this alternative would have the same impacts identified for Alternative B.

3.7.3 Cumulative Impacts

The geographic scope or cumulative impact analysis area (CIAA) includes BLM managed lands within the Field Office boundary as sufficient for analysis because the vegetative fuel treatments are a small percentage of Field Office but in combination with other past, present, and foreseeable future actions within the project area could have impacts to scenic values. Temporal

scope for this analysis is five years as Alternatives B and C's impacts to visual resources would be negligible to the casual observer as vegetation is reestablished. It is recognized that the two alternatives propose to re-treat vegetation, as needed, for wildfire fuel breaks.

Past actions and developments are few within the CIAA. Past or existing projects, which would be noticeable to visitors, include the 138 kV transmission line adjacent to State Highway 51 built in 2008; El Paso Gas pipeline, a buried natural gas pipeline right-of-way bisecting the area in a southeast-northwest direction, built in 1956; and Ant Hill water storage tank, located on private property, but noticeable to visitors driving the Owyhee Uplands Backcountry Byway. An existing, beneficial impact was the designation of about 270,000 acres of wilderness in 2009, within the Field Office, to be permanently managed as VRM Class I.

Present actions in the northwest area include several thousand acres of scattered vegetation treatments which were recently implemented (Western juniper wildfire fuels reduction/wildlife habitat improvement project). The public can collect firewood, by permit, in the juniper vegetation treatment area. As downed trees are removed, the visual impact, within 2-3 years, will be negligible.

While livestock grazing is the major land use in the Field Office, there are no reasonably foreseeable projects planned for grazing or other land use activities, such as energy development facilities or recreational site construction, which may adversely impact visual resources. The direct effects of a recreational visitor experiencing aspects of project implementation, including machinery operation, and the indirect impacts, of weak to moderate degrees of visual contrast, conform to the area's VRM classes for either Alternative B or C. Because of these factors, cumulative effects that would occur would be minimal and do not contribute significantly to the degree of intensity of the direct impacts.

No cumulative impacts from herbicide use would occur.

3.8 Cultural Resources

3.8.1 Affected Environment

The proposed project covers a wide geographic area in the BFO in southwestern Idaho. The majority of the project area is physically characterized as a "Dissected High Lava Plateau," bounded by the Bruneau River to the east and Battle Creek to the west. This area is at the boundary of the Great Basin and Columbia Plateau cultural groups and was occupied by the Northern Shoshone, Northern Paiute and Bannock peoples (Palmgren, 1999). Although populations were mainly centered along the Snake River to the north, the Bruneau plateau lands provided a variety of plant and animal subsistence resources, utilized for over 10,000 years. Site types include temporary camps, rockshelters, petroglyphs, and rock alignments and complexes that may be associated with hunting practices. Currently no Traditional Cultural Properties or Native American Religious concerns have been identified by Tribal members through the scoping and consultation process.

Research identified 28 previously recorded Native American sites along the proposed treatment roads. Ten had been determined potentially eligible for listing on the National Register of Historic Places (NRHP), due to their unique qualities and potential to add knowledge of Native

American use of the area. Sixteen require further research to determine their listing status; two were determined ineligible due to lack of information potential.

Historically, Euro-Americans first entered southwestern Idaho in the early 1820s for fur trapping and exploration expeditions. In 1845, people began traveling west along the Oregon Trail through southwest Idaho, north of the project area. The discovery of gold in Idaho in the 1860s brought the area's first true settlers. In support of the mines, scattered ranches and farms were soon established. Wagon roads and trails were developed, linking these ranches and the small developing communities. As communities grew in importance and size, additional roads were developed, creating a network of travel corridors across the project area. Some of those roads are still in use. Ranching has continued as the main economic pursuit. Various site types can be found, including historic roads, residential sites, short term camps along old roads, simple trash scatters, and historic ranching features with water developments.

Research identified 13 previously recorded historic sites in the proposed project area. Of these, four had been determined potentially eligible for NRHP listing, three were left unevaluated pending further research, and the remaining six were determined ineligible, due to their lack of information potential.

New cultural resource surveys, covering 3,286 acres, were conducted for this project, and resulted in ten new sites recorded: seven historic, one Native-American, and two multicomponent (both historic and Native-American elements). Seven were determined ineligible for NRHP listing and three were left unevaluated, pending further research. In addition to the new sites, six previously recorded sites were revisited. One was reevaluated as ineligible, four were left unevaluated pending further research and one eligible site was updated. Through consultation with the Idaho State Historic Preservation Office, not all mow roads were surveyed since it was determined that mowing will have no adverse effect to historic properties. No Native American Traditional Cultural Properties were identified during these new surveys.

During August 2011, the Big Hill Fire burned across much of the area. Soil stabilization efforts, i.e., drill seeding, was proposed. In response, additional roads were proposed for development as greenstrips. Prior to drill seeding, an archeological contractor conducted cultural resource surveys that encompassed 3.96 miles of new greenstrip roads. During those surveys, one multi-component site was recorded within 150 feet of a greenstrip road; site eligibility is pending.

3.8.2 Environmental Consequences

3.8.2.1 Alternative A

There will be no effects to any historic property because no ground disturbing activities will occur.

3.8.2.2 Alternative B

Under this alternative, eligible sites or unevaluated sites along the greenstrip development and greenstrip maintenance roads will be flagged and avoided by ground disturbing activities. Pending evaluation, all unevaluated sites are treated as eligible until their eligibility is determined. Drill seeding has the potential to impact the site's spatial and vertical integrity by

digging up artifacts and features and dispersing them. In addition, significant artifacts may be broken or uncovered exposing them to potential unauthorized collection. If a site is within a treatment area and contains a significant quantity of cheatgrass, then a backpack sprayer will be used to apply herbicides. Two of the unevaluated sites are historic roads; one is the Blackstone to Grasmere Road. Both roads remain unevaluated for NRHP listing, pending further research. No adverse effect is expected to the historic roads since all ground disturbing activities will take place outside the road prism. A few recorded historic road alignments outside the prism of the existing drivable road may be drill seeded; however, drill seeding will not obliterate the road since these sections are typically very rocky reducing the drill's impact and penetration into the soil.

Under this alternative livestock use in the area may need to be restricted to allow seeded vegetation to become established. This may be accomplished through construction of temporary fences or moving salt and/or existing watering troughs to a disturbed site at least ½ mile away from greenstrips. These areas have not been identified for this EA, but will be surveyed for cultural resources when identified. Any eligible or unevaluated cultural resources found will be avoided by these proposed activities.

The third treatment type is mowing 100-foot wide strips along 75 miles of road using a rubber-wheeled tractor with a mower attachment. The use of rubber tired equipment and mowing vegetation to no less than 6 inches reduces the potential for ground disturbing activities; therefore, mowing is not expected to have an adverse effect to any historic property. Few sites with features or artifacts above 6 inches are in the project area. An occasional tin can or other artifact may be crushed by the mowing (tires) but this will not affect the site's eligibility.

Maintaining the effectiveness of fuel breaks by applying herbicides would benefit cultural resources by protecting them from direct effects of wildfire and the indirect effects of being exposed by the loss of vegetation.

3.8.2.3 Alternative C

Under this alternative, 300-foot wide greenstrips will be newly developed along 87 miles of road and existing greenstrips maintained along 42 miles. Establishment of greenstrips will include drill-seeding with a rangeland drill, application of herbicides to reduce invasive annuals, and, possibly, mowing. Temporary fencing and relocation of salt blocks and existing watering troughs may also occur to allow establishment of the newly seeded areas.

Cultural resource surveys have been completed along the 42 miles of existing greenstrip roads; however, only a few of the 87 miles of new roads have been surveyed. Based on past surveys, the likelihood that sites would be found is low to moderate, with some of the roads themselves being historic. Prior to any ground disturbing activities along these roads, cultural resource surveys will be conducted, as required under Section 106 of the National Historic Preservation Act. Any eligible or unevaluated sites will be avoided by ground disturbing activities.

Herbicide use in this alternative would have the same impacts identified for Alternative B.

3.8.3 Cumulative Impacts

The scope of analysis for cumulative impacts to cultural resources is the project area since cultural sites can be directly impacted by actual project activities and potentially indirectly impacted as a result of those activities. The temporal range for cumulative impacts would be the life of this project. Five actions that happened in the past, and are expected to occur in the immediate future have been identified. Of these, livestock grazing and trailing, and recreation are the two which would potentially impact cultural resources, and are discussed under each alternative. Military training, which predominately takes place in the airspace above the project area, is not a ground disturbing activity and has no potential to adversely impact cultural resources. The impacts of noxious weed treatments on cultural resources were previously analyzed under Environmental Assessment #ID-100-2005-EA-265. It was determined that adverse impacts would be minimal as treatment areas are small and scattered. Power line construction and maintenance along State Highway 51 will not cumulatively impact sites, since the power line corridor was surveyed for cultural resources prior to installation. Any cultural resource concerns were addressed at that time.

Alternative A – Cultural resource sites would continue to experience ground disturbing impacts from livestock congregating or trailing through sites, and recreationists if they camp where sites are located. Livestock can adversely impact sites directly through trampling of soil deposits and artifact breakage and indirectly through reducing excess vegetation causing soil erosion. Recreationists can impact sites by fire pit excavation, collection of artifacts, and denuding a site of vegetation, thus enhancing soil erosion and causing a horizontal dispersion of artifacts.

Alternative B - The combined impacts to cultural resources in the treatment areas from the proposed action, livestock grazing and trailing, and recreation may slightly increase under this alternative. If an increase in livestock use occurs, due to forage increases from herbaceous plants where fuels treatments were done, then additional impacts may occur if livestock congregate on an eligible cultural resource site. In the Bruneau Field Office's 2012 Trailing EA defined preferred alternative one national register eligible cultural resource site that was in jeopardy of being adversely impacted by trailing was identified along a designated route (Environmental Assessment DOI-BLM-ID-B010-2012-0003-EA). This site is not within a route identified for this Fuel Breaks project therefore there will be no cumulative impacts to the site from the proposed projects. Any livestock overnighting areas identified along trailing routes through the Fuel Breaks project area will be surveyed for cultural resources and if national register eligible sites are identified their impacts will be mitigated as required under Section 106 of the Historic Preservation Act, thus there will be no cumulative impacts to those sites. Given the relatively small percentage of sites along treatment roads, few known sites would be impacted. However, since many of the roads proposed for mowing have not been surveyed, it is difficult to determine if or how many sites may be at risk from increased livestock use. Based on existing data, the number of NRHP-eligible sites should be low.

An increase in recreational use is not expected from the proposed project. However, if people camp or recreate on or near a recently mowed cultural resource site, then artifacts may be more visible, and there may be a higher tendency towards unauthorized collection. No known NRHP-eligible sites are within or near dispersed camping areas along designated mow roads; therefore, an increase in impacts would be negligible.

There would be no cumulative impacts from herbicide use.

Alternative C – The combined impacts to cultural resources in the treatment areas from the proposed action, livestock grazing, and recreation would be similar to Alternative B.

Given the low density of sites in the analysis area, and the conclusion that direct and indirect effects are not expected since mitigation measures are in place to protect NRHP-eligible sites, there will be no incremental impact, beneficial or adverse, to cultural resources.

4.0. Consultation and Coordination

4.1 List of Preparers

List of Preparers	Title	Responsibility
Michael McGee	Wildlife Biologist, BLM	Project Lead, Wildlife, Special Status Animals
Sarah Heide	Fire Use Specialist, BLM	Fuels, Fire Behavior, Air Quality
Kathi Kershaw	Ecologist, BLM	Vegetation, Special Status Plants, Noxious Weeds, Soils
Karen Kumiega	Archaeologist, BLM	Cultural Resources
Dianna Sampson	GIS Specialist, BLM	GIS Analysis and Maps
Dave Draheim	Recreation, BLM	Recreation, Visual Resource Management
Jon Haupt	Range Specialist, BLM	Rangeland Management
Mike Boltz	Range Specialist, BLM	Rangeland Management
Seth Flanigan	NEPA Specialist, BLM	NEPA Compliance

4.2 List of Agencies, Organizations, and Individuals Consulted

- Shoshone-Paiute Tribes
- Idaho Conservation League
- Idaho Department of Fish and Game
- Idaho Army National Guard
- Owyhee Cattlemen's Association
- U.S. Fish and Wildlife Service
- Western Watersheds Project
- Idaho State Historic Preservation Office

4.3 Public Participation

External scoping was conducted in November 5, 2008, through letters and maps sent to adjacent landowners and interested organizations, tribes, and individuals. The project appeared in the online Bruneau Field Office Schedule of Proposed Actions in December 2009 and January 2010. A copy of this EA is available upon request from:

BUREAU OF LAND MANAGEMENT
Boise District, Bruneau Field Office
3948 Development Avenue
Boise, ID 83705-5389.

5.0. Literature Cited

Albini, F. A. 1976. Estimating wildfire behavior and effects. Gen. Tech. Rep. INT-30. Ogden, Utah: Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 92 p.

Aldridge, C. L., and R. M. Brigham. 2001. Nesting and Reproductive Activities of Greater Sage-Grouse in a Declining Northern Fringe Population. The Condor. 103:3:537-543.

Anderson, H. E. 1982. Aids to determining fuel models for estimating fire behavior. Gen. Tech. Rep. INT-122. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 22 p.

Andrews, P. L.; Bevins, C. D.; Seli, R. C. 2003. BehavePlus fire modeling system, version 2.0: User's Guide. Gen. Tech. Rep. RMRS-GTR-106WWW. Ogden, UT: Department of Agriculture, Forest Service, Rocky Mountain Research Station. 132 p.

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

Baker, W. L., J. Garner, and P. Lyon. 2009. Effect of imazapic on cheatgrass and native plants in Wyoming big sagebrush restoration for Gunnison sage-grouse. Nat. Areas J. 29:204–209.

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

Beck, J. L., and D. L. Mitchell. 2000. Influences of livestock grazing on sage grouse habitat. Wildlife Society Bulletin 28:993-1002.

Beck, J.L., J.W. Connelly and Kerry P. Reese. 2008. Recovery of Greater Sage-Grouse Habitat Features in Wyoming Big Sagebrush following Prescribed Fire. Restoration Ecology 17(3): 393-403.

Blaisdell, J. P., R. B. Murray, and E. D. McArthur. 1982. Managing Intermountain rangelands - Sagebrush-grass ranges. USDA, For. Serv. Gen. Tech. Rep. INT-134. Intermt. For. and Range Exp. Sta., Ogden, UT. 41 p.

Bradfield, T. D. 1974. On the behavior and ecology of the pigmy rabbit Sylvilagus idahoensis. M. S. Thesis. Idaho State University, Pocatello. 43 pp.

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

Bureau of Land Management. 2011. Southwestern Idaho Fire Planning Unit, Fire Management Plan. U.S. Department of Interior, Bureau of Land Management, Boise District. 331 pp.

_____. 2009. Murphy Subregion Travel Management Plan: Boise District and Owyhee Field Office (Environmental Assessment No. ID-130-2007-EA-3431): Bureau of Land Management.

_____. 2007. Noxious and Invasive Weed Treatment: Boise District and Jarbidge Field Office (Environmental Assessment No. ID-100-2005-EA-265): Bureau of Land Management.

Burak, G. S. 2006. Home ranges, movement, and multi-scale habitat use of pygmy rabbits (Brachylagus idahoensis) in Southwestern Idaho. M. S. Thesis. Boise State University, Boise, Idaho. 106 pp.

Burgan, R. E.; Rothermel, R. C. 1984. BEHAVE: Fire behavior prediction and fuel modeling system – FUEL subsystem. Gen. Tech. Rep. INT-167. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 126 p.

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

Collins, C.P. and T.D. Reynolds (2005, September 2). Ferruginous Hawk (*Buteo regalis*): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/ferruginoushawk.pdf [9/12/2011].

Connelly, J. W., and C. E. Braun. 1997. Long-term changes in Sage Grouse Centrocercus urophasianus populations in western North America. Wildlife Biology 3:229–234.

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

Connelly, J. W. K. P. Reese, R. A. Fischer, and W. L.Wakkinen. 2000b. Response of a Sage Grouse breeding population to fire in southeastern Idaho. Wildlife Society Bulletin 28:90–96.

Connelly, J. W., C. A. Hagen, and M. A. Schroeder. 2011. Characteristics and Dynamics of Greater Sage-grouse Populations. Pp 53-68 *in* S. T. Knick and J. W. Connelly (Editors). Greater Sage-grouse: Ecology and Conservation of a Landscape Species and Its Habitats. Studies in Avian Biology (Vol.38), University of California Press, Berkeley, CA.

Courtney, R. F. 1989. Pronghorn use of recently burned mixed prairie in Alberta. Journal of Wildlife Management 53:302-305.

Dalke, P. D., D. B. Pyrah, D. C. Stanton, J. E. Crawford, and E. F. Schlatterer. 1963. Ecology, productivity, and management of sage grouse in Idaho. Journal of Wildlife Management 27:811-841.

Davies, K.W.; J.D. Bates; D.D. Johnson; A.M. Nafus. 2009. Influence of mowing Artemisia tridentata ssp. wyomingensis on winter habitat for wildlife. Environmental Management. 44(1):84-92.

Dechant, J. A., M. L. Sondreal, D. H. Johnson, L. D. Igl, C. M. Goldade, A. L. Zimmerman, and B. R. Euliss. 2003. Effects of management practices on grassland birds: Ferruginous Hawk. Northern Prairie Wildlife Research Center, Jamestown, ND. Northern Prairie Wildlife Research Center Online. http://www.npwrc.usgs.gov/resource/literatr/grasbird/feha/feha.htm (Version 12DEC2003).

Dobkin, D. S., and J. D. Sauder. 2004. Shrubsteppe landscapes in jeopardy. Distributions, abundances, and the uncertain future of birds and small mammals in the Intermountain West. High Desert Ecological Research Institute, Bend, OR.

"Endangered and Threatened Wildlife and Plants: Listing *Lepidium papilliferum* (Slickspot Peppergrass) as a Threatened Species Throughout Its Range." Federal Register 74:194 (October 8, 2009) p. 52014

Fagerstone, K. A., G. K. Lavoie, and R. E. Griffith Jr. 1980. Black-tailed jackrabbit Diet and Density on Rangeland and near Agricultural Crops. J. Range. Manage. 33:229-233.

Finney, M. A. 1998. FARSITE: Fire Area Simulator—model development and evaluation. Res. Pap. RMRSRP-4. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 47p.

Fischer, R.A., K.P. Reese, and J.W. Connelly. 1996. An investigation on fire effects within xeric sage grouse brood habitat. Journal of Range Management 49:194-198.

Floyd, Todd. Personal interview. 4 April 2011.

Garton, E. O., J. W. Connelly, J. S. Horne, C. A. Hagen, A. Moser, and M. A. Schroeder. 2011. Greater Sage-Grouse Population Dynamics and Probability of Persistence. Pp. 293-382 *in* S. T. Knick and J. W. Connelly (Editors). Greater Sage-grouse: Ecology and Conservation of a Landscape Species and Its Habitats. Studies in Avian Biology (Vol.38), University of California Press, Berkeley, CA

Goodrich, S. 2005. Classification and capabilities of woody sagebrush communities of western North America with emphasis on sage-grouse habitat. Pages 17-37 in Sage-grouse habitat restoration symposium proceedings. Proc RMRS-P-38. U.S. Department of Agriculture Forest Service, Rocky Mountain Research Station, Fort Collins, CO, Fort Collins, CO.

Green, J. S. and J. T. Flinders. 1980. Mammalian Species, Brachylagus idahoensis. The American Society of Mammalogists 125:1-4.

Hanser, S. E., and S. T. Knick. 2011. Greater Sage-grouse as an umbrella species for shrubland passerine birds: a multiscale assessment. Pp 472-487 *in* S. T. Knick and J. W. Connelly (Editors). Greater Sage-grouse: Ecology and Conservation of a Landscape Species and Its

Habitats. Studies in Avian Biology (Vol.38), University of California Press, Berkeley, CA.

Higgins, Kenneth F., Arnold D. Kruse, and James L. Piehl. 1989. Effects of fire in the Northern Great Plains. U.S. Fish and Wildlife Service and Cooperative Extension Service, South Dakota State University, Brookings, South Dakota. Extension Circular 761. Jamestown, ND:Northern Prairie Wildlife Research Center Online. http://www.npwrc.usgs.gov/resource/habitat/fire/index.htm (Version 16MAY2000).

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

Howard, Janet L. 1995. Antilocapra americana. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2012, April 25].

Idaho Department of Fish and Game. 2003--2010. Progress Report, Upland Game, Study II, Job 1. Idaho Department of Fish and Game, Boise, ID

_____. 1994. Idaho's Amphibians and Reptiles. Idaho Department of Fish and Game, Boise, Idaho. 12 pp.

_____. 2004. Idaho's Amphibians and Reptiles: Description, Habitat, and Ecology. Nongame Wildlife Leaflet, IDFG, Boise ID.

_____. 2005. Idaho Comprehensive Wildlife Conservation Strategy. Idaho Conservation Data Center, Idaho Department of Fish and Game, Boise, ID. http://fishandgame.idaho.gov/cms/tech/CDC/cwcs.cfm

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

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

Ingelfinger, F., and S. Anderson. 2004. Passerine response to roads associated with natural gas extraction in a sagebrush steppe habitat. Western North American Naturalist 64:385 395.

Jenni, D. A., and J. E. Hartzler. 1978. Attendance at a sage-grouse lek: implications for spring census. Journal of Wildlife Management 42:46-52.

Katzner, T. E. and K. L. Parker. 1997. Vegetative characteristics and size of home ranges used by pygmy rabbits (Brachylagus idahoensis) during winter. Journal of Mammalogy 78:1063-1072.

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

Keinath, D. A. and M. McGee. 2004. Species assessment for pygmy rabbit (Brachylagus idahoensis) in Wyoming. Prepared for Bureau of Land Management. Wyoming Natural Diversity Database, Laramie. 82 pp.

Knick, S. T., and J. T. Rotenberry. 2002. Effects of habitat fragmentation on passerine birds breeding in intermountain shrubsteppe. *Studies in Avian Biology* 25:130–140.

Knick, S. T., D. S. Dobkin, J. T. Rotenberry, M. A. Schroeder, W. M. Vander Haegen, and C. van Riper III. 2003. Teetering on the edge or too late? Conservation and research issues for avifauna of sagebrush habitats. Condor 105:611–634.

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

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

Kyser, G. B., J. M. DiTomaso, M. P. Doran, S. B. Orloff, R. G. Wilson, D. L. Lancaster, D. F. Lile, and M. L. Porath. 2007. Control of medusahead (*Taeniatherum caput-medusae*) and other annual grasses with imazapic. *Weed Technology* 21:66-75.

Larrucea, E. S., and Brussard, P. F., 2008a: Efficiency of various methods used to detect presence of pygmy rabbits in summer. Western North American Naturalist, 68: 303–310.

Larrucea, E. S., and Brussard, P. F., 2008b: Habitat selection and current distribution of the pygmy rabbit in Nevada and California, USA. Journal of Mammalogy, 89: 691–699.

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

Lyon, A. G., and S. H. Anderson. 2003. Potential Gas Development Impacts on Sage-grouse Nest Initiation and Movement. Wildlife Society Bulletin, Vol. 31, No. 2 (summer 2003), pp. 486-491.

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

Meinke, C. W., S. T. Knick, and D. A. Pyke. 2009. A spatial model to prioritize sagebrush landscapes in the Intermountain West (U.S.A.) for restoration. Restoration Ecology **17:**652–659.

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

Miller, M., and J. Findley. 2001. Plants. Pages 141–165 in M.Miller, editor. Fire effects guide. NFES 2394, National Interagency Fire Center, Boise, Idaho (available from http://www.nwcg.gov/pms/RxFire/FEG.pdf) (accessed on 15 April, 2011).

Miller, R. F. and L. E. Eddleman. 2000. Spatial and temporal changes of sage grouse habitat in the sagebrush biome. Agricultural Experiment Station, Oregon State University Technical Bulletin No. 151.

Moser, A., and B. Lowe. 2011. Wildlife Monitoring on the Murphy Complex Fire. Idaho Department of Fish and Game. Boise, ID. Final Report 40pp.

National Wildfire Coordination Group. 2011. Glossary of Wildfire Terminology. PMS 205. May, 2011. Available *online* at: www.nwcg.gov/pms/pubs/glossary/n.htm

Naugle, D. E., K. E. Doherty, B. L. Walker, M. J. Holloran, and H. E. Copeland. (2011). Energy development and Greater Sage-Grouse. Pp. 489-503 *in* S. T. Knick and J. W. Connelly (Editors). Greater Sage-grouse: Ecology and Conservation of a Landscape Species and Its Habitats. Studies in Avian Biology (Vol.38), University of California Press, Berkeley, CA.

Nelle, P.J., K.P. Reese, and J.W. Connelly. 2000. Long-term effects of fire on sage-grouse nesting. Journal of Range Management 53:586-591.

Olendorff, R.R. 1993. Status, biology, and management of ferruginous hawks: a review. Raptor Res. And Tech Asst Cen., Spec. Rep. BLM-ID-PT-93-13-4350. USDOI, BLM, Boise, ID 84 pp.

Owyhee County Sage-grouse Local Working Group. 2004. Sage-grouse Management Plan. Owyhee County, ID. 31Pp.

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

Palmgren, L. 1999. Bruneau and Owyhee Field Office Background Document. Manuscript on file at the Bruneau Field Office, Boise, Idaho.

Pyke, D. A. 2011. Restoring and Rehabilitating Sagebrush Habitats. Pp. 531-549 *in* S. T. Knick and J. W. Connelly (Editors). Greater Sage-grouse: Ecology and Conservation of a

Landscape Species and Its Habitats. Studies in Avian Biology (Vol.38), University of California Press, Berkeley, CA

Rochester, C. J., C. S. Brehme, D. R. Clark, D. C. Stokes, S. A. Hathaway, and R. N. Fisher. 2010. Reptile and Amphibian Responses to Large-Scale Wildfire in Southern California. Journal of Herpetology, Vol 44, No. 3, pp. 333-351.

Rothermel, R. C. 1972. A mathematical model for predicting fire spread in wildland fuels. Res. Pap. INT-115. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 40 p.

Russell,K.R., D. H. Van Lear, and D. C. Guynn Jr. 1999. Prescribed fire effects on herpetofauna:review and management implications. Wildlife Society Bulletin. 27(2): 374-384.

Scott, J. H. and R. E. Burgan. 2005. Standard fire behavior fuel models: a comprehensive set for use with Rothermel's surface fire spread model. Gen. Tech. Rep. RMRS-GTR-153. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 72 p.

Slater, S. J. 2003. Sage-grouse (*Centrocercus urophasianus*) use of different-aged burns and the effects of coyote control in southwestern Wyoming. Thesis, University of Wyoming, Laramie.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Soil Survey Geographic (SSURGO) Database for Soil survey of Elmore County Area, Idaho, Parts of Elmore, Owyhee and Ada Counties, Idaho. Available online at http://soildatamart.nrcs.usda.gov. Accessed July 15, 2011.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Soil Survey Geographic (SSURGO) Database for Soil survey of Owyhee County Area, Idaho, Available online at http://soildatamart.nrcs.usda.gov. Accessed July 15, 2011.

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

Smith, D. G., J. R. Murphy, and N. D. Woffinden. 1981. Relationships between jackrabbit abundance and Ferruginous Hawk reproduction. Condor 83:52- 56.

Ulmschneider, H, D. Hays, H. Roberts, J. Rachlow, T. Forbes, J. Himes, E. Sequin, M. Haworth, T. Katzner, A. Kozlowski, R. Rauscher, and P. Lauridson. 2004. Surveying for Pygmy Rabbits. Fourth Draft. Boise District BLM, 25 pp.

USDI Bureau of Land Management. 2009. Rapid ecological assessment of the Northern Basin and Range and Snake River Plain. BLM/OC/ST-10/002+1636. Denver, CO. 43pp.

USDI BLM. 2011a. Greater sage-grouse interim management policies and procedures. Instruction Memorandum IM 2012-043, Washington Office BLM. Washington, D.C.

USDI BLM. 2011b. National Greater Sage-Grouse Land Use Planning Strategy. Instruction Memorandum IM 2012-044, Washington Office BLM. Washington, D.C.

USDI BLM. 2010. Gunnison and Greater Sage-grouse Management Considerations for Energy Development (Supplement to *National Sage-Grouse Habitat Conservation Strategy*). Instruction Memorandum IM 2010-071, Washington Office BLM, Washington, D.C.

USDI BLM. 2009. Seasonal Wildlife Restriction and Procedures for Processing Requests for Exceptions on Public Lands in Idaho. Information Bulletin IB 2009-039, Idaho State Office BLM. Boise, ID.

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

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

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

USDI Fish and Wildlife Service, Snake River Basin Office. 2002. Section 7 Guidelines – Snake River Basin Office. *Spiranthes diluvialis,* Ute ladies'-tresses (threatened).

USDI Fish and Wildlife Service. 2002. Birds of conservation concern 2002. U.S. Department of the Interior, Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, VA.

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

_____. 2010b. Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition to List the Pygmy Rabbit as Endangered or Threatened. Federal Register, 75 FR 60516 60561.

_____. 2010c. Questions and Answers for the Greater Sage-Grouse Status Review. http://www.fws.gov/mountain-prairie/species/birds/sagegrouse. 8 pp.

_____. 2002. Endangered and Threatened Wildlife and Plants; 12-Month Finding for a Petition To List the Wasatch Front Columbia Spotted Frog as Threatened Throughout Its Range. Federal Register, 67 FR 55758 55767.

U.S. Department of the Interior, National Park Service, Wind Cave National Park. 1966. Conservation plan: Wind Cave National Park, Custer County Conservation District. Wind Cave National Park, SD: U.S. Department of the Interior, National Park Service, Wind Cave National Park. 46 p.

Utah Division of Wildlife Resources. 2003. The Pygmy Rabbit *Brachylagus idahoensis*. http://wildlife.utah.gov/habitat/pdf/pygmy_rabbit.pdf.

Whisenant, S.G. 1990. Changing fire frequencies on Idaho's Snake River Plains: ecological and management implications. Pages 4-10 In: McArthur, E.D., E.M. Romney, E.M. Smith and P.T. Tueller, Compilers. Proceedings: Symposium on Cheatgrass Invasion, Shrub Die-Off, and Other Aspects of Shrub Biology and Management, Las Vegas, NV, April 5-7, 1989. U.S. Forest Service, Intermountain Research Station, GTR INT-276, Ogden, UT.

White, C. M., and T. L. Thurow. 1985. Reproduction of Ferruginous Hawks Exposed to Controlled Disturbance. Condor 87:14-22.

Wisdom, M. J., C. W. Meinke, S. T. Knick, and M. A. Schroeder. 2011. Factors Associated with Extirpation of Sage-Grouse. Pp. 451-474 *in* S. T. Knick and J. W. Connelly (Editors). Greater Sage-grouse: Ecology and Conservation of a Landscape Species and Its Habitats. Studies in Avian Biology (Vol.38), University of California Press, Berkeley, CA

Wilson, T. L., F. P. Howe, and T. C. Edwards Jr. 2011. Effects of Sagebrush Treatments on Multi-Scale Resource Selection by Pygmy Rabbits. Journal of Wildlife Management 75(2):393–398.

Woffinden, N.D. and J.R. Murphy. 1977. Population dynamics of the ferruginous hawk during a prey decline. Great Basin Naturalist 37: 411-425.

Woffinden, N.D. and J.R. Murphy. 1989. Decline of a ferruginous hawk population: a 20-year summary. Journal of Wildlife Management 53:1127-1132.

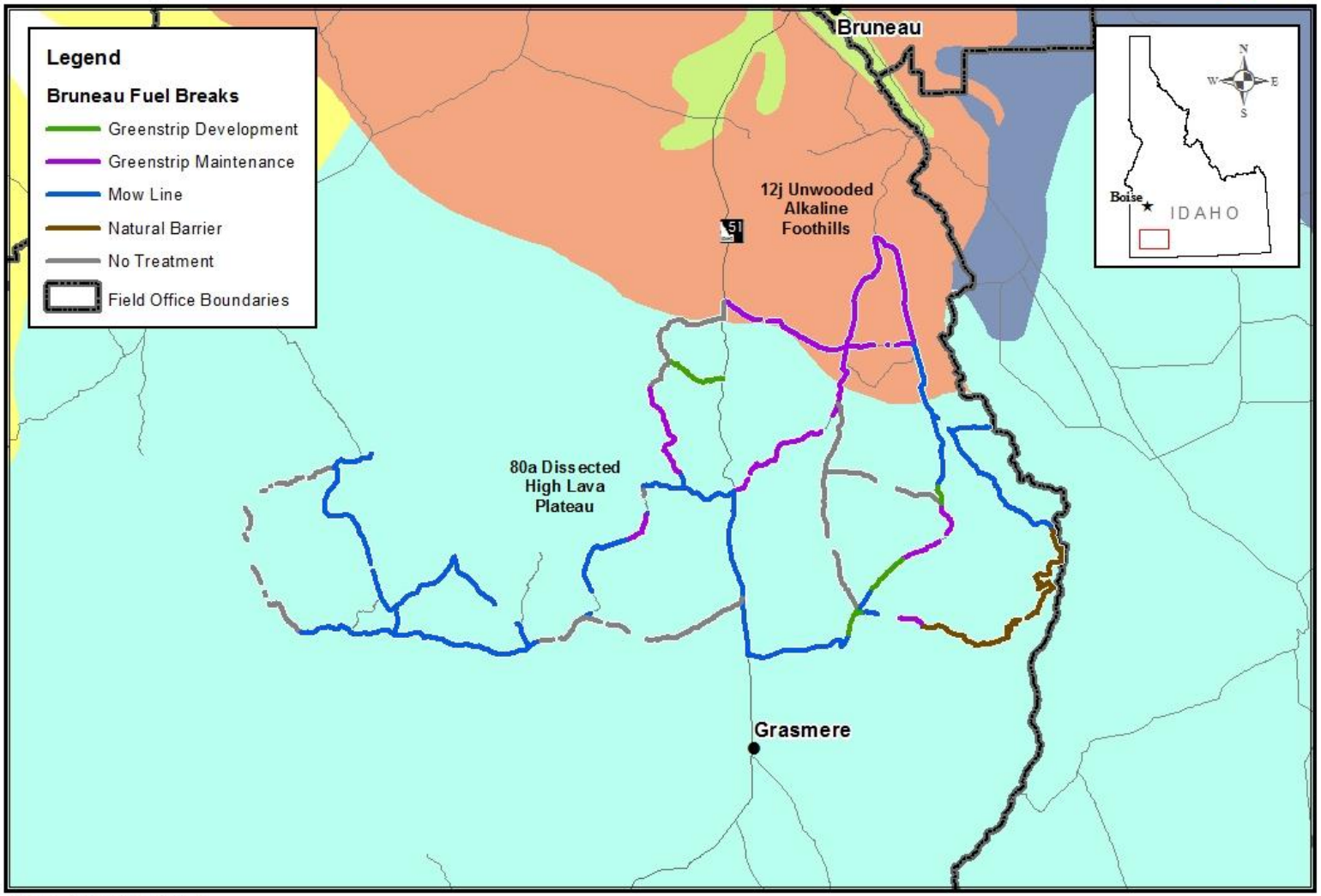
Wyoming Interagency Vegetation Committee. 2002. Wyoming Guidelines for Managing Sagebrush Communities with Emphasis on Fire Management. Wyoming Game and FishDepartment and Wyoming BLM. Cheyenne, WY. 53 pp.

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

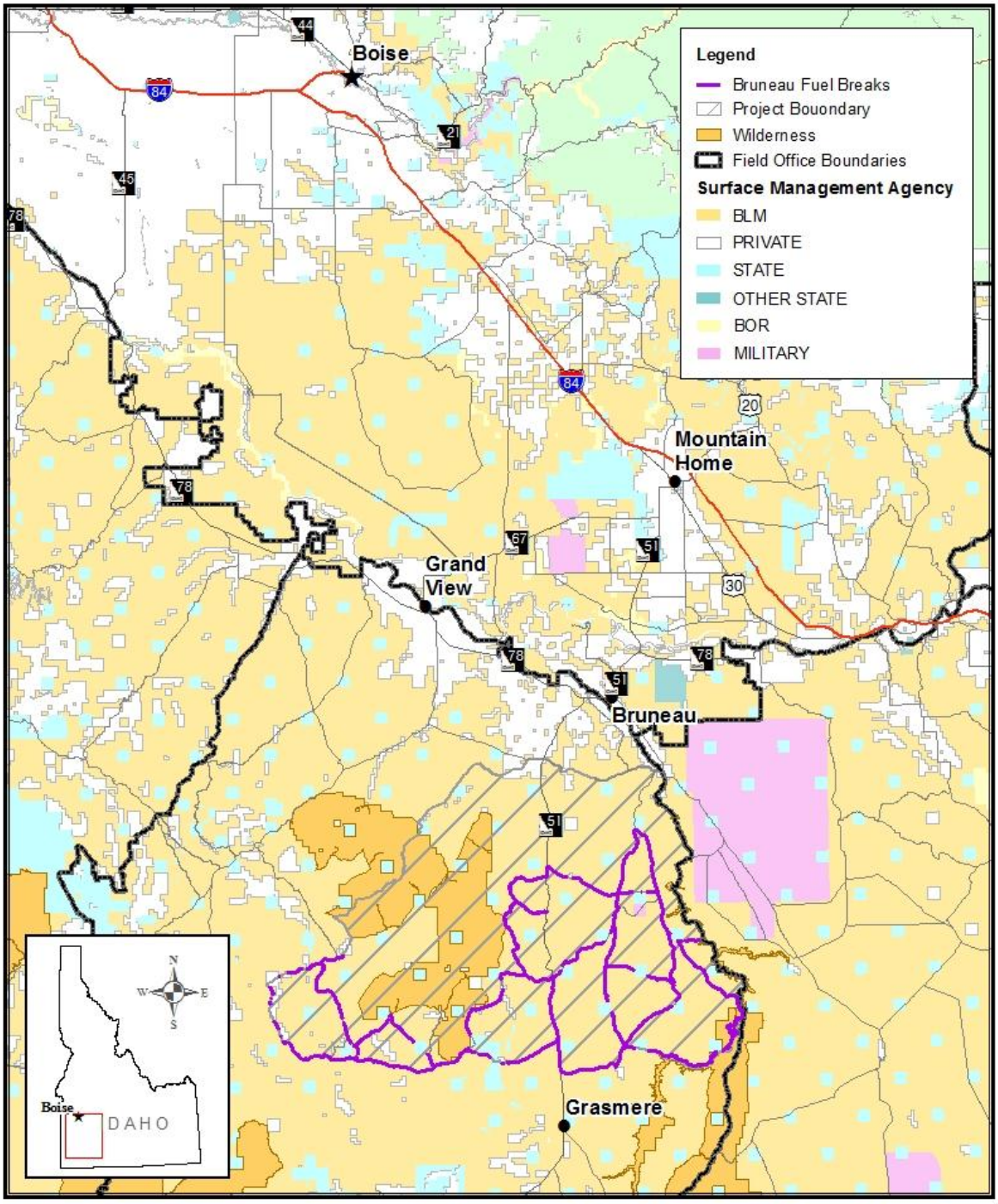
.

6.0. Maps

Map #1 - US Ecoregion Level IV



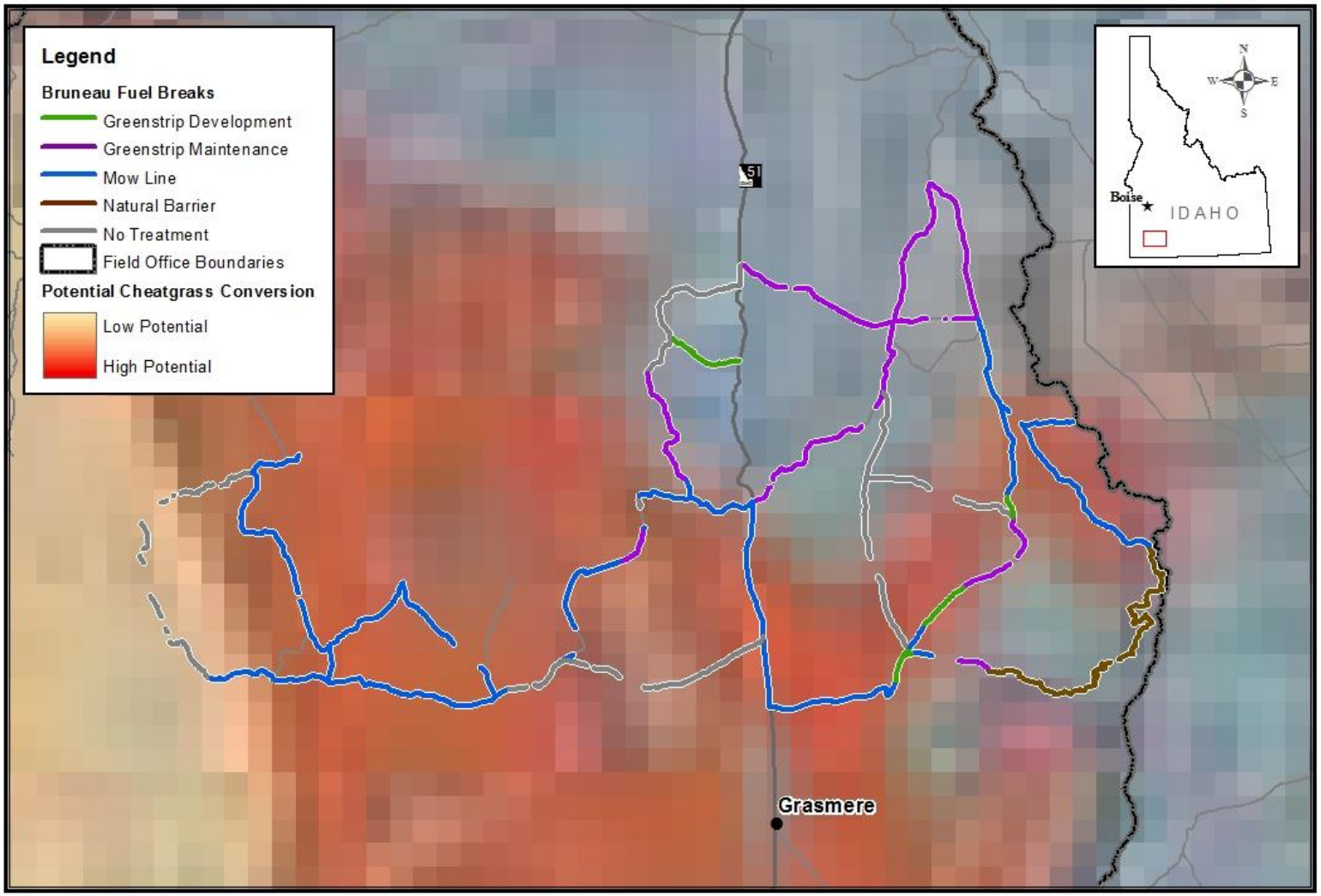
Map #2 - Bruneau Fuels Break Vicinity Map



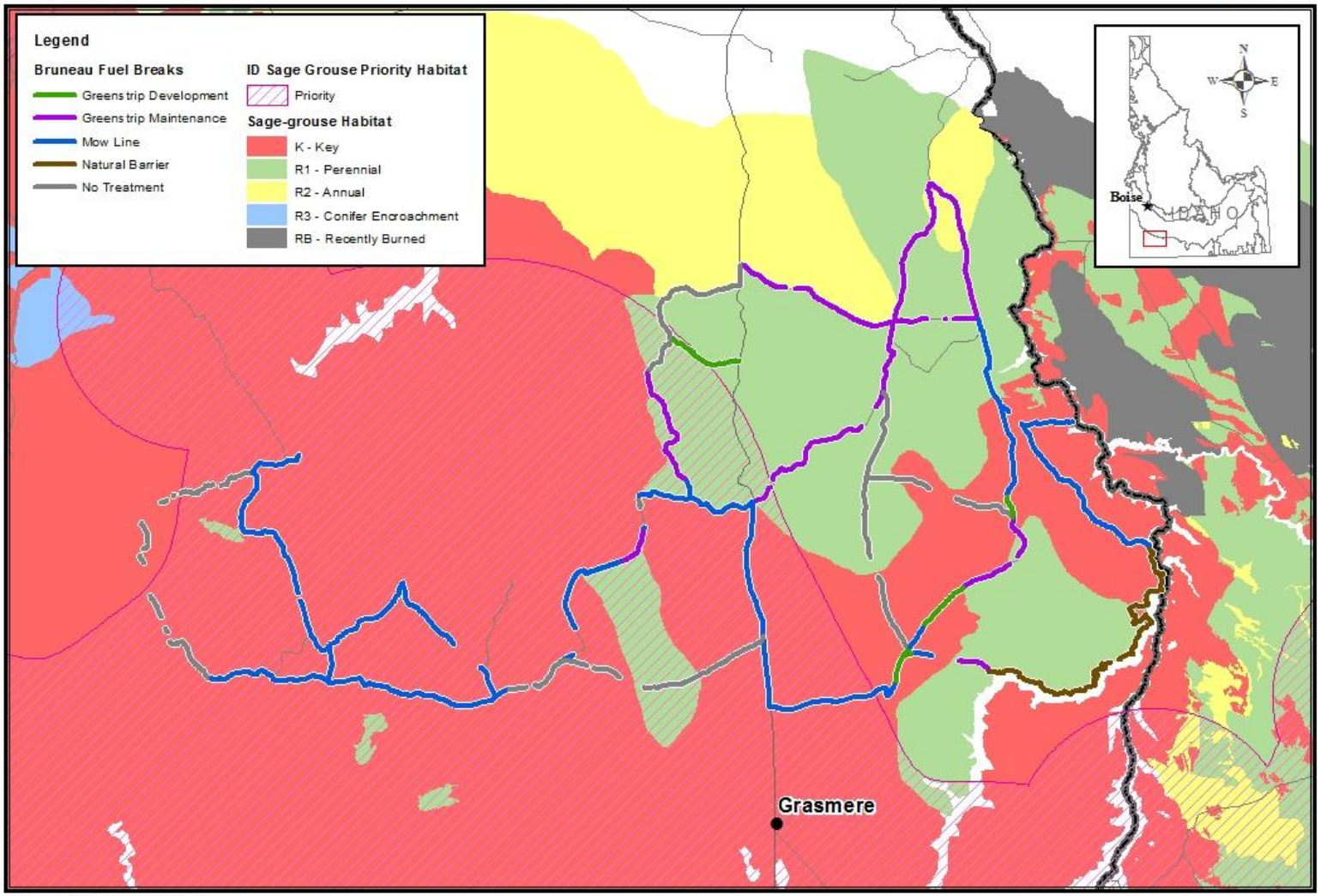
The sources of the data are from Idaho-BLM Corporate Data, and the USGS.
5/1/2013

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

Map #3 - Potential for Large Fires



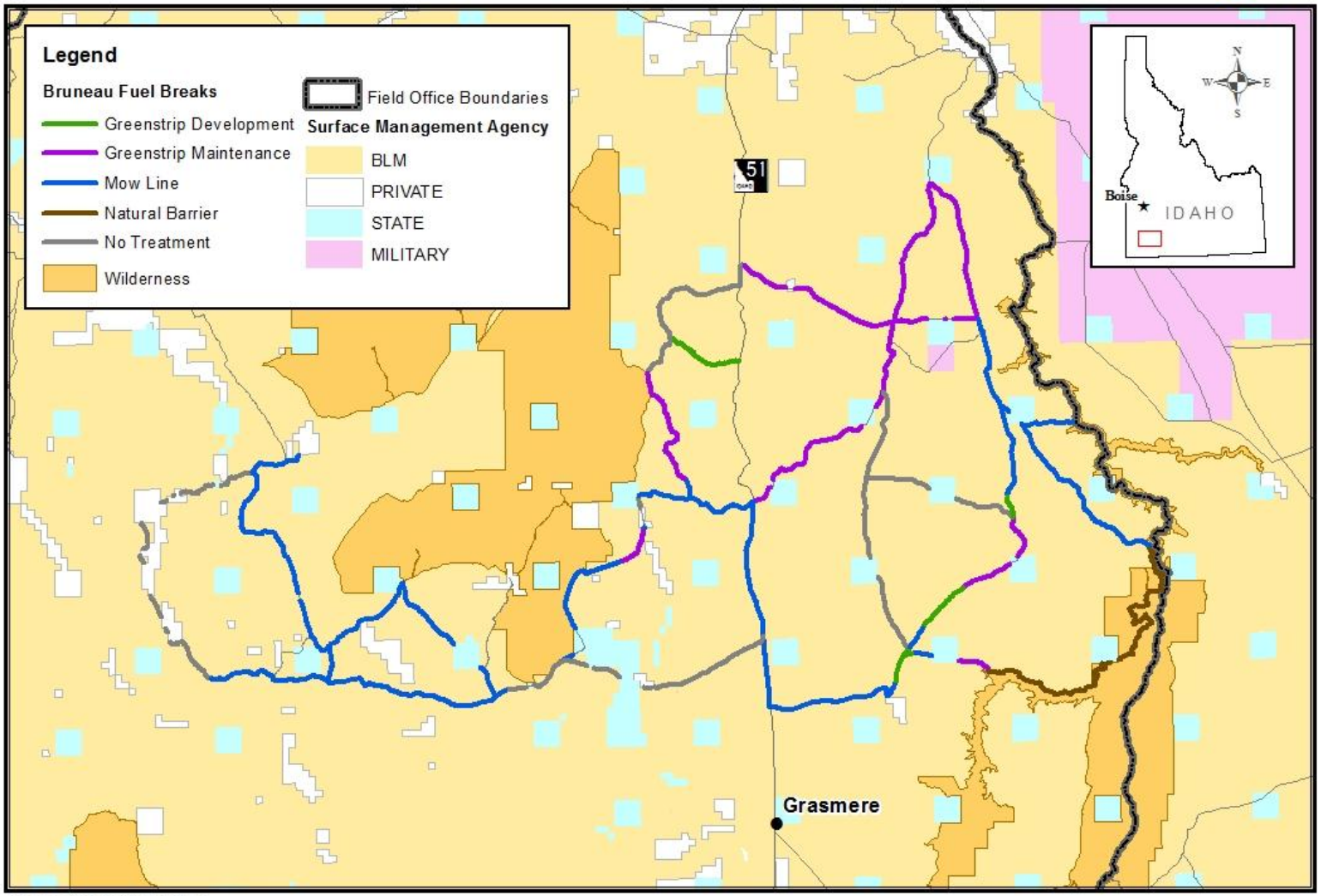
Map #4 - Sage-grouse Habitat & Proposed Action (Alt B)



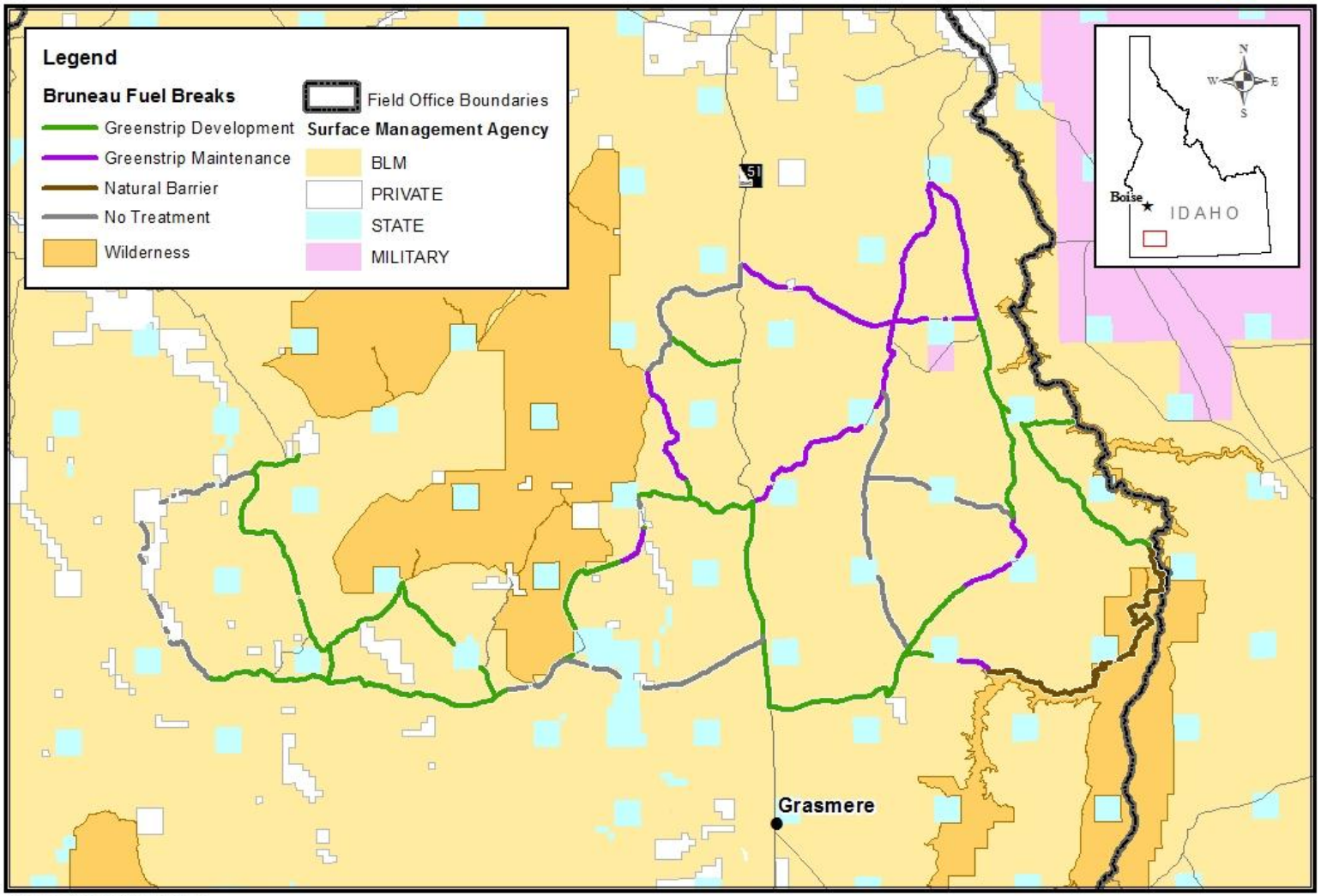
The sources of the data are from Idaho-BLM Corporate Data, and the USGS.
5/1/2013

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

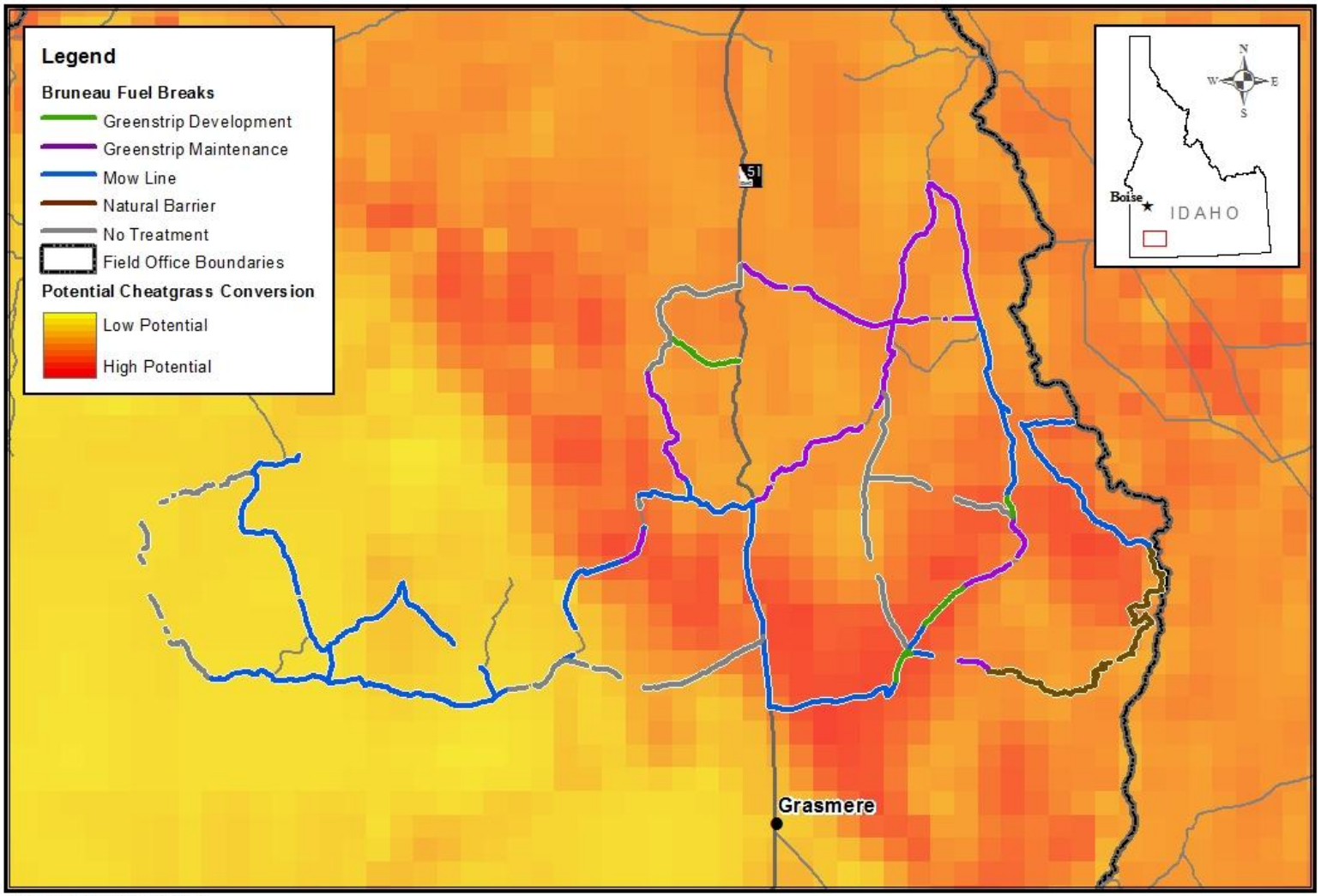
Map #5 - Bruneau Fuel Breaks (Alt B)



Map #6 - Bruneau Fuel Breaks (Alt C)



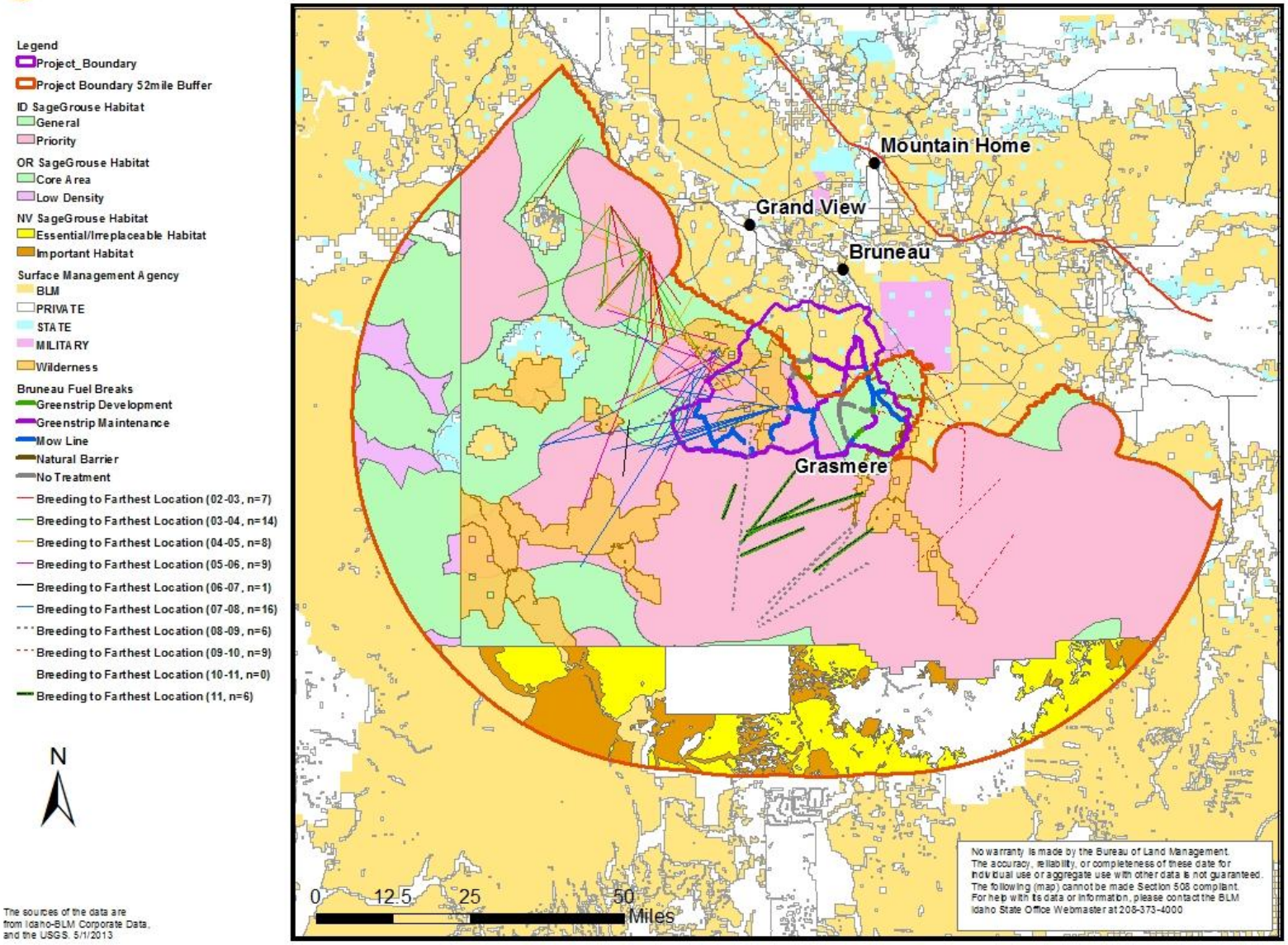
Map #7 - Potential for Conversion to Cheatgrass (Alt B)



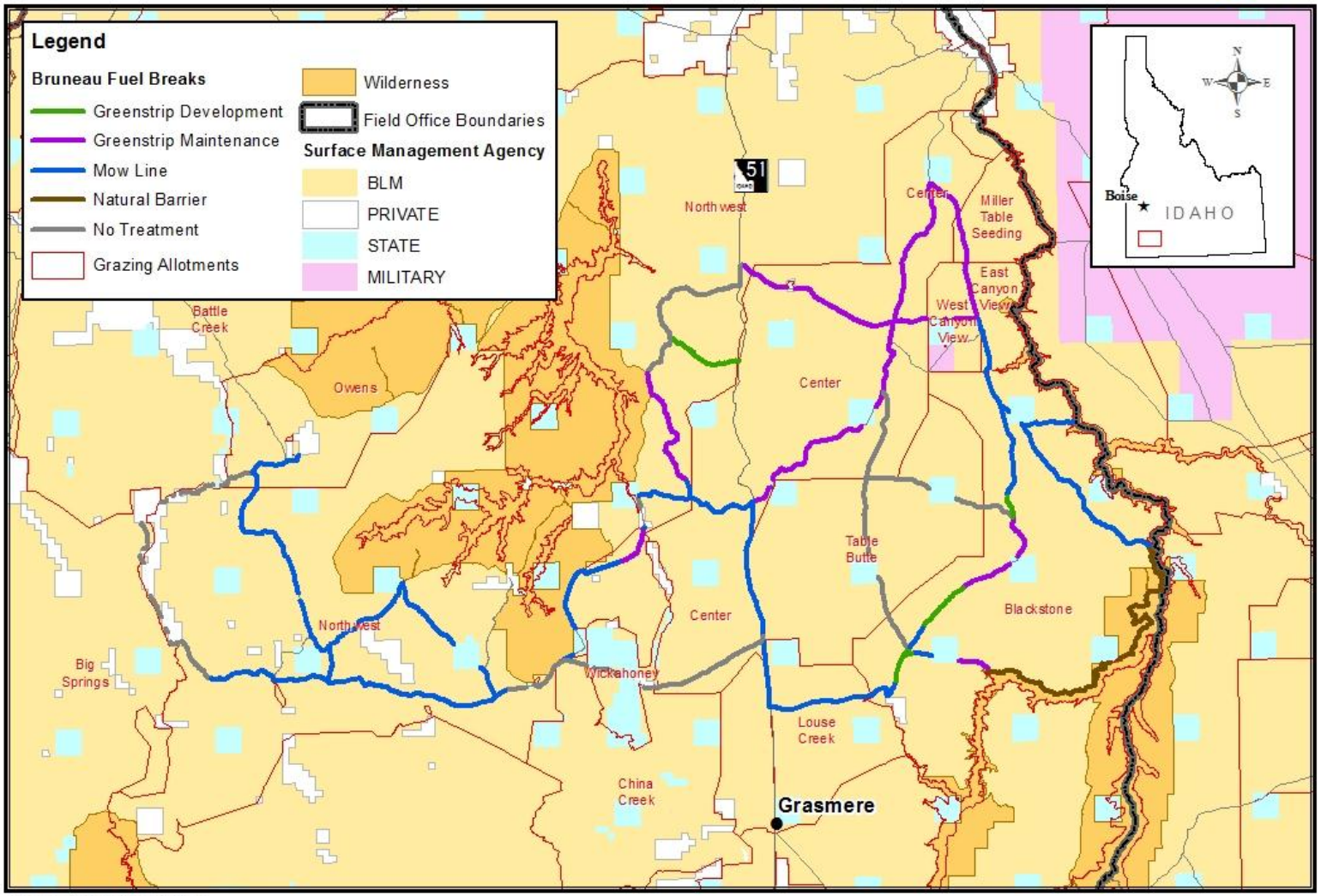
The sources of the data are from Idaho-BLM Corporate Data, and the USGS.
5/1/2013

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

Map #8 - Cumulative Effects Analysis Area for Sage-grouse



Map #9 - Allotments Affected by Bruneau Fuel Breaks (Alt B)



7.0. Appendices

7.1 Glossary of Terms

Anchor Point - An advantageous location, usually a barrier to fire spread, from which to start constructing a fireline. The anchor point is used to minimize the chance of being flanked by the fire while the line is being constructed.

Backfiring - A tactic associated with indirect attack, intentionally setting fire to fuels inside the control line to slow, knock down, or contain a rapidly spreading fire. Backfiring provides a wide defense perimeter and may be further employed to change the force of the convection column. Backfiring makes possible a strategy of locating control lines at places where the fire can be fought on the firefighter's terms.

Chain - Unit of measure in land survey, equal to 66 feet (20 meters) (80 chains equal 1 mile). Commonly used to report fire perimeters and other fireline distances, this unit is popular in fire management because of its convenience in calculating acreage (e.g., 10 square chains equal one acre).

Direct Attack - Any treatment applied directly to burning fuel, such as wetting, smothering, or chemically quenching the fire, or by physically separating the burning from unburned fuel.

Fire Front - The part of a fire within which continuous flaming combustion is taking place. Unless otherwise specified, the fire front is assumed to be the leading edge of the fire perimeter.

Fire Intensity - The rate of heat release per unit time per unit length of fire front. Numerically, it is the product of the heat yield, the quantity of fuel consumed in the fire front, and the rate of spread.

Flaming Front - That zone of a moving fire where the combustion is primarily flaming.

Flame Length - The distance between the flame tip and the midpoint of the flame depth at the base of the flame (generally the ground surface); an indicator of fire intensity.

Fuel Bed - An array of fuels usually constructed with specific loading, depth, and particle size to meet experimental requirements; also, commonly used to describe the fuel composition.

Fuel Bed Depth - Average height of surface fuels contained in the combustion zone of a spreading fire front.

Fuel Loading - The amount of fuel present expressed quantitatively in terms of weight of fuel per unit area. This may be available fuel (consumable fuel) or total fuel and is usually dry weight.

Fuel Model - Simulated fuel complex for which all fuel descriptors required for the solution of a mathematical rate of spread model have been specified.

Haines Index - An atmospheric index used to indicate the potential for wildfire growth by measuring the stability and dryness of the air over a fire. The index can range between 2 and 6, with 6 indicating a very dry and unstable atmosphere with high potential for wildfire growth.

Indirect Attack - A method of suppression in which the control line is located some considerable distance away from the fire's active edge. Generally, conducted in a fast-spreading or high-intensity fire to utilize natural or constructed firebreaks, fuel breaks, and favorable breaks in the topography. The intervening fuel is often backfired, but occasionally, depending on conditions, the main fire is allowed to burn to the line.

Mid-flame Wind Speed - The speed of the wind measured at the midpoint of the flames, considered to be most representative of the wind speed affecting fire behavior.

Particle Size - The size of a piece of fuel, often expressed in terms of size classes.

Rate of Spread - The relative activity of a fire in extending its horizontal dimensions. It is expressed as rate of increase of the total perimeter of the fire, as rate of forward spread of the fire front, or as rate of increase in area, depending on the intended use of the information. Usually, it is expressed in chains or acres per hour for a specific period in the fire's history.

7.2 Monitoring Plan

Implementation monitoring would be completed by the project inspector. Documentation of the implementation monitoring would be recorded in the daily diary.

Effectiveness monitoring would be conducted at 3-5 year intervals in treated areas to determine whether vegetation conditions achieve the identified decision criteria. The monitoring would be completed using a standard interagency monitoring tool called FFI (FEAT/FIREMON Integrated). The methods described below adhere to established FFI guidelines and would address most objectives pertaining to various fuel break treatments, including mowing, and vegetative greenstrips. 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. Effective fuel breaks would lead to successful maintenance of sage-grouse habitat. Effectiveness of fuel breaks would be documented using the Fuels Treatment Effectiveness Monitoring protocol. This protocol is an online tool to be used by all DOI Bureaus and the U.S. Forest Service to track the effectiveness of fuels treatments.

Based on decision criteria, vegetation characteristics to be measured would include, but not be limited to:

- average brush height and percent canopy cover
- height, density, and species composition of all species
- presence/density/spread of cheatgrass or other invasive species of concern in the treatment area
- percent ground cover

Permanent transects would be established where conditions are representative of the various prescribed treatments in the project area. At these locations, a witness post would be placed at the treatment area's interior edge to permanently mark the monitoring site. To eliminate potential impacts to transects from post placement, the post would be located a minimum of five meters away from the transects' start points. Two transects would be established at the monitoring location, one inside the treatment and one outside. A 100-meter transect would be located within the treatment area and run parallel with the treatment. Data collected along this transect would document species diversity, invasive species density, and brush data. A second 100-meter transect would be located outside of the treated area and run perpendicular to the treatment. Data from this transect would document impacts to the untreated areas from the treatment, including species drift and bare ground. Additionally, Universal Transverse Mercator (UTM) coordinates will be recorded for both the start and end points of each transect so that transects may be repeated in subsequent years.

Information recorded along transects would depend on the monitoring objectives identified in the decision. It would include, but not be limited to, plot description, location, and photographs. For greater information, line and point intercept and density data would also be collected. All data would be recorded using the methods found in *Monitoring Manual for Grasslands, Shrubland, and Savanna Ecosystems, Volume 1* (USDA-ARS Jornada Experimental Range).

Plot Description

Record general information related to the macro plot (i.e., plot number, 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 will 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 two meter intervals along the 100 meter transect, for a total of 50 points.

Density

Density of all species would be recorded using a 1 meter x 1 meter nested plot frame at 20 meter intervals along the 100 meter transect, for a total of five plots. Density data would be used to determine species density and composition.

Line Intercept

Canopy cover and height will be measured along the length of each transect.

7.3 Special Status Wildlife Species

Special Status Species for the Bruneau Field Office and likelihood of occurrence in the Bruneau Fuel Breaks Project Area (PA).

Species (Status[1]/Type[2])	Key Habitat Associations	Probability of Occurrence	Rationale
Mammals			
California Bighorn Sheep *Ovis canadensis californicus* (S/3)	Rugged desert canyonlands and mountains in sagebrush steppe/grassland habitat	Documented	Species exists in canyon areas within PA.
Kit Fox *Vulpes velox* (S/4)	Open desert and greasewood, sagebrush habitat south of the Snake River	Documented	Species is considered scarce in Idaho but sightings have occurred near or in PA.
Pygmy Rabbit *Brachylagus idahoensis* (S/2)	Tall dense stands of big sagebrush in deep loamy or sandy-loam soils (USFWS 2010b).	Documented	Likely exists where habitat conditions are met within PA.
Spotted Bat – *Euderma maculatum* (S/3)	Roosting: cracks and crevices in cliffs Foraging: xeric shrublands, some needleleaf forests, lava, and vegetated lava cover types (	Documented	Canyon areas provide suitable roosting habitat and there is suitable foraging habitat in PA.
Townsend's Big-eared Bat - *Corynorhinus townsendii* (SSC, S/3)	Roosting/hibernation: caves, abandoned mines, buildings, bridges, rock crevices, and hollow trees Foraging: mesic and xeric shrublands, forest uplands, most needleleaf forests	Documented	Canyon areas provide suitable roosting habitat and there is suitable foraging habitat in PA.
Wyoming Ground Squirrel *Spermophilus elegans nevadensis* (S/4)	Variety of sagebrush plains and grassland habitats such as meadows, valley bottoms, foothills, cultivated fields, and rocky slopes	Likely to Occur	The species has been documented near the PA and suitable habitat is present in PA.
Birds			
American White Pelican – *Pelecanus erythrorhynchos* (S/2)	Inland shallow lakes, marshes, rivers. Breeds on isolated islands (Ehrlich et al. 1988)	Not Likely to Occur	No suitable habitat within PA.
Bald Eagle – *Haliaeetus leucocephalus* (BGEA/2)	Rivers, lakes, and reservoirs. Usually nests in snags (Ehrlich et al. 1988)	Not Likely to Occur	Limited suitable habitat within PA.
Black-throated Sparrow – *Amphispiza bilineata* (S/3)	Open areas with scattered shrubs and trees including deserts and semi-desert grasslands (Ehrlich et al. 1988)	Likely to Occur	Suitable habitat is present in PA.
Brewer's Sparrow – *Spizella breweri* (S/3)	Closely associated with sagebrush preferring dense stands broken up with grassy patches (Ehrlich et al. 1988)	Documented	Species has been documented in PA.
Calliope Hummingbird - *Stellula calliope*	Riparian forests, willow and alder thickets,	Not Likely to	Limited suitable habitat within PA.

Species (Status[1]/Type[2])	Key Habitat Associations	Probability of Occurrence	Rationale
(S/3)	mountain shrub, montane forests (Ehrlich et al. 1988)	Occur	
Columbian Sharp-tailed Grouse – *Tympanuchus phasianus columbianus* (S/3)	Grass and grassland–shrub habitats (Ehrlich et al. 1988)	Not Likely to Occur	Not known to occur within PA and limited distribution in the region.
Ferruginous Hawk – *Buteo regalis* (S/3)	Arid to semi-arid regions, grasslands and agricultural areas (Ehrlich et al. 1988)	Likely to Occur	Suitable habitat is present throughout PA.
Golden Eagle – *Aquila chrysaetos* (BGEA/2)	Open habitats such as sagebrush. Usually nests on cliff faces but will use power poles or snags (Ehrlich et al. 1988)	Documented	Species has been documented in PA.
Greater Sage-grouse – *Centrocercus urophasianus* (C/1)	Sagebrush, sagebrush steppe, riparian areas (Ehrlich et al. 1988)	Documented	Species has been documented in PA.
Lewis Woodpecker - *Melanerpes lewis* (S/3)	Open woodland and forests, including riparian woodland (Ehrlich et al. 1988)	Low	Limited suitable habitat within PA.
Loggerhead Shrike – *Laniu ludovicianus* (S/3)	Short grass, sagebrush patches with isolated trees (Ehrlich et al. 1988)	Documented	Species has been documented in PA.
Mountain Quail - *Oreortyx pictus* (SSC, S/3)	Overgrown clearings in montane coniferous forests (Ehrlich et al. 1988)	Not Likely to Occur	Limited suitable habitat within PA and thought to be extirpated from the region.
Northern Goshawk - *Accipiter gentilis* (S/3)	Forests, forest edges, open woodlands (Ehrlich et al. 1988)	Not Likely to Occur	No suitable habitat within PA.
Peregrine Falcon – *Falco peregrines* (S/3)	Wide variety of habitats including forests and deserts. Usually nests on cliffs. (Ehrlich et al. 1988)	Moderately Likely to Occur	Species was observed near PA.
Prairie Falcon – *Falco mexicanus* (S/3)	Open habitat in mountainous regions, shortgrass prairie, alpine tundra (Ehrlich et al. 1988)	Documented	Species has been documented in PA.
Sage Sparrow – *Amphispiza belli* (S/3)	Sagebrush obligate that needs large continuous stands of sagebrush or sage steppe (Ehrlich et al. 1988)	Documented	Species has been documented in PA.
Trumpeter Swan *Cygnus buccinator* (S/3)	Lakes, ponds, marshes, sluggish rivers with emergent vegetation (Ehrlich et al. 1988)	Not Likely to Occur	No suitable habitat within PA.
White-faced Ibis *Plegadis chihi* (S/4)	Marshes, swamps and wetlands (Ehrlich et al. 1988)	Not Likely to Occur	No suitable habitat within PA.
Willow Flycatcher – *Empidonax trailii* (S/3)	Riparian thickets, especially willows (Ehrlich et al. 1988)	Not Likely to Occur	Limited suitable habitat within PA, but it may be found in canyon areas with thick riparian cover.

Species (Status[1]/Type[2])	Key Habitat Associations	Probability of Occurrence	Rationale
Yellow-billed Cuckoo – *Coccyzus americanus* (C/1)	Open woodland with dense undergrowth, riparian woodland and thickets (Ehrlich et al. 1988)	Not Likely to Occur	Limited suitable habitat within PA, but it may be found in canyon areas with thick riparian cover.
Reptiles			
Common Garter Snake - *Thamnophis sirtalis* (S/3)	Usually found near water and swims readily (IDFG 2004)	Moderately Likely to Occur	Species was observed near PA.
Longnose Snake – *Rhinocheilus lecontei* (S/3)	Upland habitat with sandy to sandy loam soils with a shrub and forb component (IDFG 2004)	Not Likely to Occur	Not known to occur in PA.
Great Basin Collared Lizard – *Crotaphytus bicinctores* (S/3)	Lower elevation rocky canyon with sparse vegetation, strongly associated with rock cover (IDFG 2004)	High	Species has been documented in PA.
Western Ground Snake – *Sonora semiannulata* (S/3)	Desert habitats with loose or sandy soils (IDFG 2004)	High	Species has been documented in PA.
Amphibians			
Columbia Spotted Frog *Rana luteiventris* (S/1)	Marshy edges of ponds and lakes or near the edges of slow moving streams (IDFG 2004)	Likely	Species has been documented near the PA.
Northern Leopard Frog – *Rana pipiens* (S/2)	Marshes and wet meadows from low valleys to mountain ridges (IDFG 2004)	Not Likely to Occur	Limited suitable habitat within PA.
Western Toad - *Bufo boreas* (S/3)	Ephemeral pools and streams, all upland habitats (IDFG 2004)	Documented	Species has been documented in PA.
Woodhouse Toad – *Bufo woodhousii* (S/3)	Lower elevation habitats, sagebrush desert, woodlands, grasslands, farmlands (IDFG 2004)	Low	Species has not been documented within or near PA.
Fish			
Bull Trout – *Salvelinus confluentus* (T/1)	Cold water streams and rivers with complex habitat and with lots of large woody debris	The Bruneau River is designated Critical Habitat	Habitat is east of the PA boundary. Treatment areas are at least 800' from Bruneau River.
Redband Trout - *Oncorhynchus mykiss gibbsi* (S,SSC/2)	Found in many streams and rivers throughout southwest Idaho.	Documented	Species has been documented in PA.
Invertebrates			
Bliss Rapids Snail – *Taylorconcha*	Cobble boulder substrate in water temperatures	Not Likely to	Outside the documented range of the

Species (Status[1]/Type[2])	Key Habitat Associations	Probability of Occurrence	Rationale
serpenticola (T/1)	between 59 – 61 degrees Fahrenheit in cold water springs and spring-fed tributaries to the Snake River and in some reaches of the Snake River	Occur	species.
Bruneau Dunes Tiger Beetle *Cicindela waynei waynei* (S/2)	Only known to occur at Bruneau Dunes State Park and one site just east of the park. Occurs primarily in the sparsely vegetated margins of sand dunes.	Not Likely to Occur	Outside the documented range of the species.
Bruneau Hot Springsnail *Pyrgulopsis bruneauensis* (S/1)	Warm water springs in Hot Creek and along an 8 mile stretch of the Bruneau River	Documented near PA	Habitat borders short section (< 8 miles) of the north-eastern PA boundary.
California Floater *Anodonta californiensis* (S/3)	Lakes and large streams at lower elevations in areas with soft substrates and relatively slow currents	Not Likely to Occur	Not known to occur in PA.
Columbia Pebblesnail *Flumincola fuscus* (S/3)	Gravel and boulder substrates in small to large rivers with cold, highly oxygenated and unpolluted waters.	Not Likely to Occur	No suitable habitat within PA.
Shortface Lanx *Fisherola nuttalli* (S/2)	Gravel and boulder substrates in swift highly oxygenated water of large rivers	Not Likely to Occur	Outside the documented range of the species.
Snake River Physa Snail *Physa natricina* (S/1)	Confined to the Snake River and distributed over 300 river miles (RM) from Ontario, OR, (RM 368) to just below Minidoka Dam, ID, (RM 675). Found in swift current on sand to boulder substrate.	Not Likely to Occur	Outside the documented range of the species.
Utah Valvata Snail *Valvata utahensis* (S/2)	Exist in the Snake River from RM 585 just below Thousand Springs Reserve to RM 837 at the confluence of the S. Fork and Henry's Fork of the Snake River. Also found in Box Canyon Creek and the Big Wood River ID. Can exist in reservoirs, springs and riverine habitat.	Low	Outside the documented range of the species.

1 = Status SSC - State of Idaho Species of Special Concern, S - BLM Sensitive Species, C - Candidate Species,

2 = Type – **1** is Federally Threatened or Endangered Proposed or Candidate Species, **2** is Rangewide/Globally Imperiled Species: Includes species with a high likelihood of being listed under the Endangered Species Act in the foreseeable future due to their rarity and/or significant endangerment factors, **3** is Regional/State Imperiled Species: Includes species that are experiencing declines in population or habitat and are in danger of regional or local extinctions in Idaho in the foreseeable future, **4** is Peripheral Species; Includes species in Idaho that are generally rare in Idaho with the majority of their breeding range outside the state.

7.4 Documented Effectiveness of a Roadside Fuel Break, Ben Dyer: July 12, 2012

Cox's Well Fire G1Q8/Big Desert Fuel Breaks

In the spring of 2012 the Upper Snake Field Office implemented its first phase of the Big Desert Fuel Breaks Project as identified in the March 2012 Environmental Assessment of the Big Desert Roads Fuel Breaks Project EA# DOI-BLM-ID-I010-2011-0014-EA. The intent of the plan was to reduce the spread potential and intensity of fires adjacent to road corridors in order to protect the remaining intact sagebrush habitat within the field office as well as improve firefighter safety. The initial treatment phase of this plan consisted of mowing approximately 30 miles (1,130 acres) of vegetation adjacent to strategic road corridors throughout the Big Desert resource area. Fuel break construction was initiated on April 30, 2012 and consisted of roto-mowing the existing vegetation to a height of roughly 8 inches at a distance between 100-150 feet from the centerline, creating fuel breaks 200-300 feet in width (Figure 1). Additionally, the new plan allowed for areas previously treated under the 2002 Big Desert Fuel Break Plan EA# ID-074-2002-0008 to be retreated either mechanically or with a cocktail of approved herbicides to reduce shrub densities and reduce fuel continuity by removing annual grasses from within the interspaces. To date approximately 230 acres have been retreated using the chemical method.

The Cox's Well Fire ignited on the afternoon of July 10, 2012 within the National Park Services (NPS) Craters of the Moon National Monument and Preserve (CMNMP). Day time temperatures during the fire ranged between 85-98°F, while live herbaceous fuel moistures averaged 78%, which correlated to an extreme fire behavior potential. Fuels within the area of the fire were classified as a GS2 (Moderate load, dry climate grass-shrub) and Fire Regime Group IV (35-100 year frequency, replacement severity). Vegetation consisted mainly of Wyoming big sagebrush (*Artemisia tridentata* spp. *wyomingensis*) and bluebunch wheatgrass (*Pseudoroegneria spicata*). Due to the passage of numerous thunderstorms fire activity was erratic, resulting in the fire actively burning on multiple flanks. Strong, gusty winds and hot dry conditions allowed the fire to quickly spread to the north, east, and south through the CMNMP/Upper Snake BLM boundary resulting in the consumption of approximately 4,575 acres of public lands administered by the Bureau of Land Management's Upper Snake Field Office and 3,225 acres of BLM Monument lands located within the CMNMP.

Suppression operations of the Cox's Well Fire began around 13:30 with initial attack crews attempting to anchor and tie the fire into the Great Rift within the BLM Monument Lands. When direct attack failed to produce results, crews backed out to the Arco/Minidoka Road and started improving the road grade and back burning off the road. Consequently, portions of the Arco/Minidoka Road were treated during the spring of 2012 for the purpose of fuel break establishment and ultimately aided in suppression operations. During firing operation of the Arco/Minidoka Road flame lengths in the treated fuels compared to the untreated fuels were substantially lessened, averaging a height of approximately two foot flame lengths. While the fuel breaks were never tested to the full extent for which they were created (running head fire), they did provide an area for suppression crews to safely and effectively implement a back burn operation (Figure 2).

Ben Dyer, Upper Snake Field Office Fire Ecologist 8/20/2012

Figure 1. Overview of the fuel breaks size and vegetative height and distribution.

Figure 2. Overview of the burned and unburned portions of the fuel breaks following the Cox's Well Fire.

7.5 Standard Operating Procedures for Herbicide Application from BLM Vegetation Treatments Using Herbicides Final Programmatic EIS