

HAWK CREEK FIELD RESTORATION
ENVIRONMENTAL ASSESSMENT
DOI-BLM-OR-135-2013-0017

Background

This field restoration project consists of approximately 460 acres of previously farmed lands within the boundaries of the Hawk Creek Allotment located approximately 8 miles west of Davenport, Washington (Map A). The 4,050 acre Hawk Creek Allotment was acquired by BLM in 2007 as part of the Columbia Basin Shrub-Steppe Assembled Land Exchange (EA#OR130-05-EA-1) for the following purposes: 1) contribute to more efficient Federal land management, 2) protect and preserve larger areas of contiguous native shrubsteppe habitat for sensitive plant and animal species, and 3) provide the public with greater access and recreational opportunities in the region.

Since acquiring this land, the BLM has conducted various resources inventories for range health and wildlife habitat. Since this parcel lies within recovery zones of two State-listed wildlife species, sage and sharp-tailed grouse, opportunities for improving the habitat for the two grouse species, while providing for livestock grazing and recreation were identified. Because restoration of old agricultural fields has proven to be highly beneficial to maintaining/improving grouse populations, we identified this opportunity at Hawk Creek.

Purpose and Need

Purpose: The purpose is to improve habitat suitability for sage and sharp-tailed grouse by increasing the species diversity and structure of vegetation on 460 acres of previously farmed lands within the Hawk Creek Allotment.

Need: Existing vegetation of the proposed treatment areas consists of a near monoculture of the introduced grass *Thinopyrum intermedium* (intermediate wheatgrass), which does not provide suitable habitat conditions for the two grouse species. This action is needed to meet the general management objective identified in the Spokane District Resource Management Plan of managing upland habitat to meet wildlife population targets. Furthermore, this action implements RMP direction to conduct habitat improvement projects where necessary to improve unsatisfactory wildlife habitat condition.

Compliance with Land Use Plans, Laws, Regulations, and Policy

This EA has been designed to conform to the following documents, which direct and provide the framework for management of BLM lands within the Spokane District:

- The National Environmental Policy Act (NEPA) (43 U.S.C. 4321-4347, 1970)

- Endangered Species Act (ESA; 7 U.S.C. § 136, 16 U.S.C. § 1531 et seq.1973) Sections 2 (c) and 7 (a) 1
- Federal Land Policy and Management Act (FLPMA) (43 U.S.C. 1701,1976)
- Public Rangelands Improvement Act (43 U.S.C. 1901, 1978)
- Spokane Resource Management Plan/Record of Decision/Rangeland Program Summary (May 1987)
- Spokane Resource Monitoring Plan (April 1988)
- Spokane Resource Management Plan Amendment/Record of Decision (December 1992)
- The Record of Decision (ROD) for the Vegetation Treatments Using Herbicides Programmatic Environmental Impact Statement (PEIS) on BLM Lands in Seventeen Western States (September 2007)
- State, local, and Tribal laws and regulations
- Section 106 of the National Historic Preservation Act (NHPA) of 1966 (36 CFR § 800.1(a)), as amended (2006)

Alternatives

Alternative A: No Action

No attempt to actively change the herbaceous plant species composition would occur on the 460 acres of previously farmed lands within the Hawk Creek Allotment.

Alternative B: Proposed Action

The proposed action includes the restoration of approximately 460 acres of previously farmed lands (Section 10, 372 acres and Section 20, 88 acres) primarily composed of intermediate wheatgrass with smaller amounts alfalfa, mustards, cheat grass, and non-native, introduced pasture weeds. The area would be site prepped using herbicide and mechanical methods and then seeded with a mix of native and non-native plants. Follow-up weed control would primarily be accomplished by mowing competitive weeds before they set seed in the spring following seeding. Spot treatments using herbicide may be conducted if noxious weeds are detected following the seeding. The following treatments would be conducted:

Fall, Year 1

- Mowing – Standing biomass of the existing vegetation would be mowed.
- Harrowing – Litter and any viable seed from mowing will incorporated into the soil surface to promote weed germination and to deplete the seed bank of intermediate wheatgrass.

Spring, Year 1

- Herbicide spraying – Herbicide will be applied to kill all existing vegetation in the field. Glyphosate (Round-up Pro) will be used at a rate of up to 7 pounds

acid equivalent per acre per year. Application method will be broadcast by tractor pulled boom. Timing of application will be between June 1 and June 31.

Summer, Year 1

- Disking – Disking will be light (approximately 4-6 inches deep) to uproot any establishing weeds, incorporate biomass, and form a soil mulch to maintain soil moisture.
- Packing – Soil clods would be crushed and soil firmed to produce a smooth seedbed.
- Herbicide spraying – Glyphosate will be applied as a follow up to the initial herbicide treatment if needed. Application methods and rates will be the same as previous not to exceed 7 pounds acid equivalent per acre per year.

Fall, Year 2

- Seeding – Tractor-based seeding using either a seed broadcaster or no-till rangeland drill (see Table 1).

Spring/Summer, Year 2

- Mowing – Weeds would be mowed to prevent their seed set and reduce competition with the establishing seeded vegetation.

Table 1: Depending on availability and cost, the seed mix would consist of a combination of the following species.

Common Name	Scientific Name	Origin
Bluebunch Wheatgrass	<i>Pseudoroegneria spicata</i>	Native
Basin Wildrye	<i>Leymus cinereus</i>	Native
Idaho Fescue	<i>Festuca idahoensis</i>	Native
Sandberg's bluegrass	<i>Poa secunda var. secunda</i>	Native
Big bluegrass	<i>Poa secunda var. ampla</i>	Native
Prairie Junegrass	<i>Koeleria macrantha</i>	Native
Arrowleaf Balsamroot	<i>Balsamorhizza sagitata</i>	Native
Flax	<i>Linum spp.</i>	Native
Yarrow	<i>Achillea millefolium</i>	Native
Sainfoin	<i>Onobrychis viciaefolia</i>	Introduced
Small Burnett	<i>Sanguisorba minor</i>	Introduced
Alfalfa	<i>Medicago sativa</i>	Introduced
Birdsfoot trefoil	<i>Lotus corniculatus</i>	Introduced
Wyoming big sagebrush	<i>Artemesia tridentata var. wyomingensis</i>	Native

Herbicides

Herbicide treatment will be implemented in accordance with the Vegetation Treatments Using Herbicides Programmatic Environmental Impact Statement (PEIS) (BLM 2007), and any subsequent updates, revisions, or replacements. Herbicide applications would comply with label

restrictions, federal and state regulations, and standard operating procedures (SOPs) described in the PEIS. The following SOPs would be adhered to in order to minimize risk from the treatment to sensitive resources.

- Herbicide applicators would be required to be certified by Washington State Department of Agriculture, wear required personal protective equipment (PPE), and comply with specimen label requirements
- To control drift, broadcast applications would be prohibited when winds exceed 15 mph
- No chemical mixing would occur within a 150-foot buffer of any live water resources (e.g. springs, wetland/riparian areas, reservoirs, or streams).
- Equipment used to apply herbicide would not be rinsed, cleaned, or drained into any water source. Excess herbicide or fluid used in cleaning equipment will be disposed of in authorized facilities.
- Livestock would not be present within the treatment area when applying herbicides without written consent of livestock operator.
- Herbicide applications would not occur when high temperatures (over 85° Fahrenheit) can cause volatilization.

Livestock Grazing

Short term livestock management of the treated areas would consist of resting the treated areas from livestock use for two growing seasons after seeding to ensure establishment of the re-vegetation effort. This will be accomplished by temporary electric fence to be established around the treated areas.

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section provides a description of the general environmental setting and resources within that setting that could be affected by the proposed action and alternative(s). In addition, the section presents an analysis of the direct, indirect, and cumulative environmental impacts likely to result from the implementation of the various alternatives.

General Setting: The project area is located in the northern portion of the Columbia Plateau Ecoregion in northern Lincoln County. Natural vegetation surrounding the project is composed of shrub-steppe transitioning to ponderosa pine. Farm fields, predominantly wheat, are nearby on private lands. Elevation is approximately 2300 feet. Topography is flat. Annual precipitation averages 10-16 inches. Soils are predominantly silt loams. The presence of resources in the project area is summarized in Table 2.

Table 2: Resources Considered in the Impact Analysis:

Access		X		The proposed action would not result in changes in access to the area.
Air Quality		X		The implementation of the proposed action or no action Alternative would not result in the production of vehicle or equipment emission or particulate matter above incidental levels.
Areas of Critical Environmental Concern (ACEC's)	X			The proposed project area is not located within or near an ACEC.
Cultural Resource			X	Impacts are disclosed under <u>Environmental Consequences</u> .
Economic and Social Values		X		The permitted number of AUMs for livestock grazing would not be changed. No other economic values are present. Access for recreation would not be changed.
Environmental Justice	X			There are no minority or low income populations residing near the proposed project area.
Fisheries	X			There are not fisheries in the proposed project area.
Floodplains	X			There are no floodplains in the proposed project area.
Forest Resources	X			The proposed action or alternatives do not contain forest resources.
Noxious Weeds and Invasive Plant Species			X	Impacts are disclosed under <u>Environmental Consequences</u> .
Mineral Resources		X		Mineral resources will not be impacted by the proposed action or alternatives.
Migratory Birds			X	Impacts are disclosed under <u>Environmental Consequences</u> .
Paleontological Resources	X			There are no paleontological resources located in the area.
Prime and Unique Farmlands	X			There are no prime or unique farmlands located within the proposed project area.
Soil Resources			X	Impacts are disclosed under <u>Environmental Consequences</u> .
Threatened, Endangered, and Sensitive Plants		X		There are no threatened, endangered or sensitive plants within the 460 acre proposed project area.
Threatened, Endangered, and Sensitive Animals			X	Impacts are disclosed under <u>Environmental Consequences</u> .
Threatened, Endangered, and Sensitive Fish	X			There are not threatened, endangered, and sensitive fish species or any water features within the project area.
Range Resources			X	Impacts are disclosed under <u>Environmental Consequences</u> .
Recreational Use		X		Recreation uses consist of hiking and hunting and would not be changed as a result of implementing the proposed action or alternatives.
Vegetation			X	Impacts are disclosed under <u>Environmental Consequences</u> .
Visual Resources		X		The proposed action or alternatives would not change the existing character of the landscape.
Wastes, Hazardous and Solid	X			There are no solid or hazardous wastes in the project area and none would be created during the implementation of the proposed action or no action alternative.

Resource				
Water Quality (Surface and Ground)	X			There are no water features, nor potential for erosion to water in the project area.
Wetland and Riparian Zones	X			There are no wetlands or riparian zones in the project area.
Wild and Scenic Rivers	X			There are no Wild and Scenic Rivers near the project area.
Wilderness	X			There are no wilderness areas or WSAs within or near the proposed project area.
Wildlife Resources			X	Impacts are disclosed under <u>Environmental Consequences</u> .

The environmental consequence section presents the potential changes to the environment due to implementation of the alternatives. This chapter describes all effects including direct, indirect, and cumulative on resources from enacting the each alternative.

AFFECTED ENVIRONMENT

Soil Resources

Three soil types are present in the fields proposed for restoration:

Benge silt loam 0-15% slopes (350 ac) – This is a very deep, well-drained soil on terraces in the channeled scablands. It formed in glacial outwash and the overlaying loess. The native vegetation is mainly grasses and forbs. The surface layer is typically a dark silt loam about 11 inches thick. The subsoil is a gravelly silt loam 14 inches thick. Below that, a substratum to a depth of 40-60 inches or more is extremely gravelly, loamy, coarse sand. The effective rooting depth is 60 inches or more. Permeability is moderate above the substratum, and available water capacity is moderate. Surface erosion is medium, and the hazard of erosion is moderate. This soil is well suited for rangeland and non-irrigated crops are commonly grown.

Anders silt loam 0-5% slopes (88 ac) – This is a moderately deep and well-drained soil on basalt plateaus. It formed in loess over fractured basalt. The native vegetation is mainly grasses and forbs. The surface layer typically a dark silt loam 12 inches thick. The subsoil is a pale silt loam 16 inches thick. The depth to basalt and effective rooting depth ranges from 20-40 inches. Permeability is moderate, and the available water capacity is low. Surface runoff is slow, and the hazard of erosion is slight. This soil is well suited for rangeland, and is also used for non-irrigated cropland. The main limitation to the use of this soil for cropland is the moderate depth to basalt, which limits the available water holding capacity.

Anders gravelly silt loam 0-15% slopes (22 ac) – The characteristics of this soil are similar to those of the Anders silt loam except there is a gravelly component to both the surface and subsoil

layers, and there may be cobble at the surface in some areas. Surface runoff is medium and hazard of erosion is moderate.

Vegetation and Botanical Resources

Prior to BLM ownership, the project area consisted of cultivated fields farmed for dryland wheat and subsequently taken out of production and seeded to intermediate wheatgrass. Intermediate wheatgrass is an introduced species used for hay and pasture. It grows to 3 to 4 feet tall and is a long-lived, rhizomatous grass. Also in the fields, are small amounts alfalfa, mustards, cheat grass, and non-native, introduced pasture weeds.

The federally-listed Spalding's catchfly (*Silene spaldingii*) inhabits moist, north facing swales in the region and is present on the allotment. However, old farm fields converted to non-native grasses, such as in this project area, are not considered suitable habitat. Extensive surveys for *Silene* have been conducted on this and other allotments, and the plant has never been found in a previously cultivated farm field. Because *Silene* does not occur in the project area, it will not be discussed further.

The historic climax plant community for the project area would have been similar to that described by NRCS's ecological site description for Loamy 9-15 inch precipitation sites. That description shows perennial, cool season, mid-statured, decreaseers (i.e., plants that decrease with heavy grazing) such as bluebunch wheatgrass and Idaho fescue as the dominant plant functional group. Perennial increaseers such as Sandberg's bluegrass and prairie Junegrass are described as sub-dominants in the historic climax. Other functional groups such as perennial tall-statured (basin wildrye), native annual grasses (sixweeks fescue), upland sedge, and a high diversity of fibrous and tap rooted forbs would have been present in minor amounts but collectively would have composed approximately 10% of the biomass. Shrubs such as big sagebrush, three-tip sage, rabbitbrush, bitterbrush, and others would have been present in various amounts depending on time since last fire.

In the area around the fields, the allotment has been assessed for rangeland health. Results showed there is a slight to moderate departure from historic conditions due to the presence of cheatgrass and other agricultural weeds, which makes up a minor component of the surrounding plant communities. Otherwise, most of the native plant functional groups are represented in the amounts expected for the site.

Noxious Weeds and Invasive Plant Species

According to Spokane District weed inventory data on the allotment, scattered small populations of noxious weeds and invasive plants are known to occur within the Hawk Creek allotment.

Noxious weed species found on the allotment include: diffuse and spotted knapweed, Canada and bull thistle, houndstoung, St. Johnswort, Dalmatian toadflax, Russian knapweed, rush skeletonweed and common mullein. Invasive annual grasses, such as cheatgrass, are known to occur in low to moderate densities (up to 40% canopy cover) throughout the allotment but do not form monotypic stands.

Noxious weeds and invasive plants do not presently dominate the proposed project area but do occur both within and adjacent to the old fields. These weed populations in the allotment surrounding the fields have resulted in a slight to moderate departure of biotic integrity according to the rangeland health evaluation for Hawk Creek in 2010. The lack of plant community diversity may be susceptible to future weed invasions if rangeland health declines.

Current treatment methods for weed control include manual, mechanical, spot treatments of herbicides, and biological controls. Designated noxious weeds are controlled within the allotment based on priorities determined by legal requirements, regional concerns, availability of funding, and BLM strategic plans and policy.

Range Resources

The proposed action is located in the Hawk Creek grazing allotment, which is grazed May 1 through October 13 with the permitted active use set at 500 AUMs. A rotational grazing system is in place utilizing 10 pastures. The grazing lease establishes a utilization limit of <50% of key upland bunchgrasses. Monitoring in 2012 showed that allotment-wide utilization on bluebunch wheatgrass averaged approximately 10%. The proposed action occurs in portions of three of the 10 pastures (Pasture 4, 10, and 11). Utilization on bluebunch in the affected pastures was <5% in 2012, except for Pasture #11, which was 35%. Intermediate wheatgrass in Pasture #4 was used at 20% utilization in 2012.

Wildlife Resources

There are no federally-listed threatened, endangered, or proposed wildlife species or their habitat found within the project area.

Greater sage-grouse and sharp-tailed grouse, both BLM Sensitive Species, are Washington State threatened species and are known to use the allotment. Sage-grouse use can be characterized as occasional (no known nesting or wintering) as a result of temporary movements from re-introductions approximately 12 miles southwest of the allotment. The allotment is not within a mapped habitat concentration area (HCA) for sage-grouse (WHCWG 2012) but is within the occupied Crab Creek sage grouse management area (Stinson et al 2004).

The allotment is relatively more important to sharp-tailed grouse, which breed at a lek on private property near the east end of the allotment and near the 372 acres of proposed restoration in Section 10 (Pasture #4). The current status of this lek is unknown. It was last active in 2009, but

habitat conversion to agriculture the vicinity occurring in 2012 seems to have disrupted the lek and it has not been found since. The fields proposed for restoration in Pasture #4 are within a mapped habitat concentration area (HCA) for sharp-tailed grouse (WHCWG 2012) and may be used for nesting, brood rearing and wintering. The fields in Pasture #10 and 11 are within ¼ mile of the HCA.

The only other BLM sensitive wildlife species known to inhabit this allotment is the long-billed curlew, and there have been regular observations of curlews in the north portion of Pasture #4 (near the proposed seeding). White-tailed jackrabbit (BLM sensitive) could be present in the fields based on habitat and range but no detections have been made. BLM sensitive species that could be present in the allotment but not expected to use the fields because of unsuitable habitat include Lewis' woodpecker, pallid bat, and moose.

Migratory bird surveys in the general project area were conducted on June 2, 2012 with assistance from the Audubon Society's Spokane Chapter. The fields proposed for this restoration were not surveyed due to poor habitat quality and low likelihood of detecting birds. In the allotment surrounding the fields 74 species were documented. Shrub-steppe and grasslands in the allotment contain all seven species of sparrows expected for the area. The following Birds of Conservation Concern (USFWS 2008) were documented on the allotment: bald eagle (foraging only), willow flycatcher, Brewer's sparrow, and sage thrasher.

Mule deer utilize the allotment year-round including during fawning and fawn-rearing periods, which provide lush, nutritious forage, water and security cover. In the Columbia Basin and the Hawk Creek allotment, fawning and fawn-rearing habitats are probably the most limiting factors for mule deer and are most available in riparian areas including streams and ponds, but also mesic vegetation in lowlands and irrigated pastures (WHCWG 2012). Presently, the fields contain trace amounts of alfalfa, which is nutritious to deer, but cover for fawning and concealment is low due to the lack of shrubs and rhizomatous stature of intermediate wheatgrass.

Cultural Resources

The project occurs within traditional use areas of the Spokane Tribe and members of the Confederated Tribes of the Colville Reservation (Miller 1998:254; Ray 1936:116, 118,119; Ross 1998:271; Teit 1928:93; Wazaney 2007). Previous cultural resources inventories of the allotment have identified both historic and prehistoric sites (Perry 2002; Schlegal 2010). The Hawk Creek allotment also includes diverse habitats such as upland plant communities, ponderosa pine forestlands, and seasonally important wildlife habitat. These habitats support plant and wildlife species of cultural value to Native Americans. A large number of plant species that are common and abundant on lithosols in the parcel are important traditional "first foods" for local tribes (Ross 1998; Wazaney 2007). Historically, camas, bitterroot, and several species of *Lomatium* or biscuit root were the main plant species gathered.

The Department of Archaeology and Historic Preservation's predictive model for site occurrence shows the Hawk Creek Allotment at moderate to high potential to contain historical and archaeological resources. Results of inventories conducted in the nearby Telford parcels confirm this (Boyd 2009; Perry 2008; Smith 2007). As a result of this project 100% of the proposed

seeding area has been inventoried for cultural resources, resulting in the recordation of 59 historic and prehistoric sites and isolates. Surveys have revealed that the area contains historic homesteads, rock features, and prehistoric lithic scatters. The majority of these sites lay just outside of the seeding area and will not be affected by associated project activities. The sites that do occur within the restoration fields include: historic isolates, homesteads, objects (such as machinery), and rock features (walls, fieldstone piles) sometimes associated with historic dumps.

ENVIRONMENTAL CONSEQUENCES

Soil Resources

Alternative A (No Action): Soils would be not affected because no treatments including harrowing or disking of the soil would be conducted. The existing stand of intermediate wheatgrass would continue to stabilize the soil.

Cumulative Effects of Alternative A (No Action): There are no direct or indirect effects, so no cumulative effects are possible.

Alternative B (Proposed Action): Treatments of the proposed action would affect soils primarily through the physical disturbance of disking. Disking would be conducted 4-6 inches deep, which is entirely within the surface layer of these soils. Mixing of the surface layer will occur, but the stratification of soil layers would not be affected. Some loss of soil due to wind erosion may occur while the soil is exposed in the first year. The hazard of erosion to these soils is reported as slight to moderate. This hazard is further mitigated by incorporating vegetation residue from intermediate wheatgrass into the soil surface layer, which will provide additional resistance to erosion.

Cumulative Effects of Alternative B (Proposed Action): The cumulative effects analysis area is the Hawk Creek 5th field watershed. The soils affected in this proposed action are common soils used for dryland wheat in this watershed. This type of farming results in some soil loss due to tillage, but incorporation of crop residues reduces this loss. Similarly, the proposed action would utilize this practice and result a short-term (1 year), un-measurably small amount of soil loss from the watershed. The 460 acre proposed action represents <0.4% of this 110,000 acre watershed.

Vegetation and Botany

Alternative A (No Action): Vegetation would be not affected because no treatments including seeding a desirable seedmix would be conducted. The existing stand of intermediate wheatgrass would continue to persist.

Cumulative Effects of Alternative A (No Action): There are no direct or indirect effects, so no cumulative effects are possible.

Alternative B (Proposed Action): Treatments of the proposed action would affect vegetation in the fields positively by establishing native and other desirable vegetation in place of the intermediate wheatgrass. The resulting vegetation will be dominated by native bunchgrass with shrubs and forbs, which resembles the historic climax plant community more closely than the near monoculture of intermediate wheatgrass.

Because the proposed 460 acres of restoration will be rested from livestock grazing, and because permitted active AUMs will not be reduced, additional grazing pressure will occur in the remainder of the allotment for 2 years. The 460 acres of fields proposed for restoration and 2-year rest account for approximately 11% of the 4050 acre allotment. Assuming forage conditions are uniform across the allotment, the proposed action could result in a temporary 1% increase in utilization over the current condition of 10%. This increase would result in utilization levels of 11% on bluebunch wheatgrass, which is well within the upper limit of 50% utilization allowed to achieve health plant communities.

Long-term (>2 years), there will be an increase in total forage production in the restored fields because diverse plant communities such as the one planned produce more forage over a longer portion of the year than monocultures. Different rooting depths and growing seasons account for this increase in production.

Cumulative Effects of Alternative B (Proposed Action): The geographic extent of cumulative effects for vegetation and wildlife impacts will be considered at the scale of the Crab Creek sage-grouse management area as described in the State's sage-grouse recovery plan (Stinson et al 2004). Using this area utilizes the concept of sage-grouse as an umbrella species, includes lands that have been determined by the recovery plan to have similar characteristics, and is inclusive of the Swanson Lakes sharp-tailed grouse recovery unit.

The 808,559-acre Crab Creek management unit is composed of approximately 80% shrub-steppe and 20% agriculture and Conservation Reserve Lands (CRP). At 460 acres, the proposed action represents about 0.3% of the agriculture and CRP lands. Fire is the biggest factor affecting the amount of functional shrub-steppe in the management area. There have been 5 major fires (10,000-20,000 each) that have removed shrub habitat in the last decade, and this trend is expected to continue. The proposed action will result in an additional 460 acres of functional shrub-steppe that partially off-sets loss due to fire.

Noxious Weeds and Invasive Plant Species

Alternative A (No Action): Under the no action alternative, noxious weeds and invasive species may increase within the Hawk Creek allotment due to local dispersion processes as well as the movement of weeds through vectors such as livestock, birds, wildlife, wind, and travel corridors. Within the project area it is unclear if intermediate wheatgrass and the current composition of non-native pasture grasses and weeds will adequately resist future noxious weed invasions or facilitate colonization of invasive plant species. Many weeds are capable of invading well-managed undisturbed areas; however, site stability and ecological processes in the project area do not appear to be failing or contributing to weed establishment and spread. Declining plant community integrity due to lack of species diversity and key functional/structural groups within

the old agricultural fields may become more vulnerable to weed invasion over time. If plant community health were to further decline the potential risk of degradation of ecosystem processes may increase.

Cumulative Effects of Alternative A (No Action): The current plant community composition and cover in the old field would continue to be composed of intermediate wheatgrass, alfalfa, and introduced pasture weeds. Intermediate wheatgrass can provide good suppression of invasive annual grasses but additional data is needed to determine if current dominance levels are adequate to exclude new weed introductions. Limited populations of noxious weeds and invasive plants would continue to occur within the project area and scattered across the allotment. Rangeland vegetation adjacent to the project area would continue to be composed of native plants and would continue to have the same risks of weed invasion based on land management actions such as livestock grazing, vehicle travel, and recreation. Weed dispersal across the allotment would also continue to be influenced by adjacent land management uses and corridors, such as numerous county and state rights of way and natural features like Hawk Creek. Since the existing vegetation composition does not demonstrate degradation of site stability or impairment of ecological processes, there is little reason to conclude that maintaining the field in its current condition would increase the risk of weed invasions compared to surrounding native plant communities.

Alternative B (Proposed Action): Herbicide treatments supporting rangeland seeding projects would reduce competition from undesirable plant species and increase the germination and survival rates of native and/or desired vegetation. Under this treatment all existing vegetation would be removed within the total 460 project acres in order to create a bare seedbed conducive to seedling establishment. Short-term impacts from the broadcast herbicide treatment may include exposed soil and reduction of forage for livestock and wildlife. Long-term impacts from the herbicide applications and subsequent seeding would include the reduction of established weed infestations and establishment of desired perennial vegetation. Additional long-term functional benefits from the herbicide treatment and the rangeland seeding would include restored habitat quality for wildlife and improved forage for livestock.

All herbicide applications will be conducted using SOPs and site-specific mitigation measures to prevent drift, off-target overspray. In addition to project implementation mitigation, risks to sensitive plants and aquatic environments are low since many of these features are over 800 feet from the old field boundaries. If herbicide and seeding treatments are successful and newly planted vegetation responds rapidly then the risk of new weed invasions due to the disturbance from preparing the seeding area should be minimal.

Glyphosate was selected because of its broad-spectrum ability to remove vegetation prior to seeding and low mobility in soil due to its tight adsorption to soil particles. At the maximum application rate (7 lbs/ae) there are no known long-term effects to plant diversity following structural composition change.

Cumulative Effects of Alternative B (Proposed Action): The proposed 460 acres of field treatments encompasses approximately 11% of the allotment, and would alter the current

vegetation composition toward to a more diverse assemblage of native and introduced-beneficial plants. Increasing floristic diversity may be beneficial toward excluding weed invasions, provided that key functional and structural groups are supporting ecological processes and there are limited niches where weed populations could establish. As in Alternative A, numerous land management actions and vectors of dispersal not related to the proposed action could promote and spread noxious weeds and invasive plants. The vegetation treatments are unlikely to disproportionately contribute to cumulative effects across the Hawk Creek allotment due to the size of the project area and the similarity of ongoing herbicide and agronomic seeding practices on adjacent non-federal lands. Glyphosate is known to have low adverse effects to birds, bees, and other wildlife and has moderate soil persistence (2 to 174 days), with 50% degradation in soil within 2 to 3 days. Glyphosate is also unlikely to have adverse cumulative effects to groundwater due to its strong adsorption to soil particles and rapid microbial degradation.

Range Resources

Alternative A (No Action): No change to the grazing rotation would occur. Livestock grazing would continue without the need to temporarily rest restored fields in Pasture #4, 10 and 11.

Cumulative Effects of Alternative A (No Action): There are no direct or indirect effects, so no cumulative effects are possible.

Alternative B (Proposed Action): Livestock would be temporarily excluded from portions of Pasture #4, 10 and 11 for two growing seasons. Based on utilization monitoring, adequate forage is available in the surrounding 3590 acres of the allotment so that no reduction in permitted AUMs would be necessary. Therefore, no effect to livestock grazing would occur other than adjustment of the rotation schedule to avoid the affected areas while vegetation establishes. Long-term (>2 years), there would be an increase in production due to increased plant diversity in the 460 acres of restored fields. This will allow for either additional forage being assigned to livestock or to wildlife depending on the outcomes of habitat and utilization monitoring.

Cumulative Effects of Alternative B (Proposed Action): There are no direct or indirect effects, so no cumulative effects are possible.

Wildlife Resources

Alternative A (No Action): Restoration of 460 acres in Pasture #4, 10 and 11 would not be conducted under this alternative. The existing seeded fields are near monocultures of a rhizomatous wheatgrass with small and declining amounts of alfalfa, which offer poor habitat to migratory birds, grouse and other SSS wildlife. Under the no action alternative these would remain as poor habitat.

Cumulative Effects of Alternative A (No Action): There are no direct or indirect effects, so no cumulative effects are possible.

Alternative B (Proposed Action): Restoration of 460 acres in Pasture #4, 10 and 11 would be conducted under this alternative. Restoration using native plant seedings result in migratory bird numbers and nest success comparable to native shrub-steppe, especially if shrubs are used in the seed mix (Schroeder and Vander Haegen 2006). For grouse, restoration of low-diversity retired agricultural fields has been shown to increase use of these fields and is recommended as a primary management activity (Stinson et al 2004, Hoffman 2012). The existing seedings are near monocultures of a rhizomatous wheatgrass with small and declining amounts of alfalfa, which offer poor habitat to migratory birds. Under this alternative these seedings would be restored from poor habitat to high quality habitat for migratory birds, grouse and other SSS wildlife.

Cumulative Effects of Alternative B (Proposed Action): The geographic extent of cumulative effects for vegetation and wildlife impacts will be considered at the scale of the Crab Creek sage-grouse management area as described in the State's sage-grouse recovery plan (Stinson et al 2004). Using this area utilizes the concept of sage-grouse as an umbrella species, includes lands that have been determined by the recovery plan to have similar characteristics, and is inclusive of the Swanson Lakes sharp-tailed grouse recovery unit.

The 808,559-acre Crab Creek management unit is composed of approximately 80% shrub-steppe and 20% agriculture and Conservation Reserve Lands (CRP). At 460 acres, the proposed action represents about 0.3% of the agriculture and CRP lands. Fire is the biggest factor affecting the amount of functional shrub-steppe in the management area. There have been 5 major fires (10,000-20,000 each) that have removed shrub habitat in the last decade, and this trend is expected to continue. The proposed action will result in an additional 460 acres of functional shrub-steppe habitat that partially off-sets loss due to fire.

Cultural Resources

Alternative A (No Action): Under the No Action Alternative, cultural resources would have a zero chance of incidental damage from the direct impact of field restoration activities (mechanical seeding).

Cumulative Effects of Alternative A (No Action): There are no direct or indirect effects, so no cumulative effects are possible.

Alternative B (Proposed Action): The targeted restoration unit is located on former agricultural lands likely under production for the last century until acquired by the BLM in 2007. As a result, several species of exotic weeds and grasses are now moderately established. Prior to Euroamerican settlement, the landscape was dominated by shrub-steppe vegetation that provided critical habitat for several species of bird, ungulates, reptiles and predators.

Mechanical rangeland seeding would avoid sites within the area of potential effect to minimize impacts. Flagging, monitoring, and fence construction around these areas is generally the most successful form of site protection. If avoidance is not possible, appropriate mitigation plans would be determined in consultation with the Department of Archaeology and Historic Preservation, affected Tribal Groups, and possibly the Advisory Council on Historic Preservation. Design features and minor modifications to the proposed undertaking are expected to minimize or eliminate any potential effects to cultural resources.

Cumulative Effects of Alternative B (Proposed Action): The cumulative effects analysis area for cultural resources is considered at the allotment scale. All action alternatives would not lead to cumulative effects for cultural resources because proposed projects would be localized or cultural resources would be completely avoided.

The proposed restoration should help to return the project area to native shrub-steppe habitat, thus enhancing the development of shrub/forb/grass plant community associations and increasing the potential for traditional uses, such as plant gathering activities. A reduction of impacts to cultural resources would result from the expected improvement in ecological conditions over an extended period of time as well through the stabilization of potentially culture-bearing sediments within the restored fields. In addition, local and regional knowledge regarding the cultural setting would be increased as a result of implementation of the standard operating procedures which require that all projects be preceded by inventory and the incorporation of mitigation efforts to reduce long term cumulative impacts.

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