Programmatic Management Direction And Environmental Assessment For Vegetation Restoration

Bureau of Land Management

Spokane District

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Programmatic Management Direction & Environmental Assessment for Vegetation Restoration

I. Introduction

This document provides programmatic direction for vegetation restoration on public lands that the Bureau of Land Management (BLM) administers in the sagebrush-steppe ecosystem restoration area (Map 1) in eastern Washington. Vegetation restoration addresses both ecosystem restoration and wildland fire stabilization, and therefore serves as a "Normal-Year Fire Rehabilitation Plan" (NFRP). The intent of this programmatic management direction in relation to fire is to examine the anticipated environmental consequences of implementing, individually or in combination, several different types of stabilization, restoration, or rehabilitation treatments.

The programmatic direction includes descriptions of on-the-ground treatments that could be implemented on site-specific projects. This EA also provides analysis of the potential impacts of these treatments to the environment.

Copies of referenced documents are available for review at the Spokane and Wenatchee BLM offices.

Environmental Analysis

Site-specific projects would require preparation of a Documentation of Land Use Plan Conformance and Documentation of National Environmental Policy Act Adequacy (DNA), tiered to this programmatic document, to identify specific project areas and select appropriate treatments based on management direction in this programmatic document. Additional on-the-ground surveys and clearances for special status wildlife, plants, and cultural resources would be required for each project plan area prior to implementing treatments.

Purpose and Need

The purpose and need of this Vegetation Restoration and Normal Year Fire Rehabilitation Plan is to restore sage grouse habitat or to implement post-fire stabilization projects, and streamline as much as possible, the actions and procedures necessary to complete either (1) restoration projects or (2) a burned area stabilization plan or other rehabilitation projects. These types of projects are considered together within this document since prescribed treatments and environmental effects are very similar.

Background

Historically, shrub-steppe had a relatively long fire rotation (approximately 60 to 110 years); therefore, a fairly large percentage of the cover type should be mature grass and shrub that is greater than 30 years old. This age class provides quality habitat for the sagebrush-obligate species. The <15- and 15- to 30-year age classes represent transitional (seral) stages that are part of the ecology of sagebrush steppe. The percentage of uncharacteristic cheatgrass reflects the currently disturbed state of this shrub steppe.

The current condition of the sagebrush-steppe reflects the high degree of disturbance that has occurred in the past 30 to 50 years. This disturbance has resulted in a significant decline in the quality of sagebrush habitat due to invasion by annual grass and noxious weeds and fragmentation of the shrub-steppe habitat. Annual grasses and noxious weeds have altered this cover type's historical fire regime and successional framework. Much of the remaining structure is found in some areas, but lacks a quality grass and forb understory (Allen 2004).

Throughout much of the Columbia Basin, there is an abundance of early seral stages, an absence of mid-seral stages, and the loss of understory in late-seral stages. Because of changes in fire ecology and succession, degraded and burned habitats would not be expected to recover sufficiently to produce quality habitat for the sagebrush-obligate species without implementing habitat recovery treatments.

In certain situations, some National Fire Plan “fuels reduction” projects may have goals identical to those for vegetation restoration. Although the main priority for National Fire Plan projects is to reduce wild fire risks to communities and the environment (USDI and USDA 2001), some fuels reduction projects may also restore vegetation and restore sage-grouse habitat. Streamlining the planning process as much as possible provides for a quick response to the urgent nature of wildland fire (burned area) emergency stabilization and rehabilitation protection, and provides management flexibility for long-term restoration projects.

At one time, shrub-steppe was the dominant vegetation across the Columbia Basin, but it now covers less than 40 percent of its original area. Settlement of the Columbia Basin resulted in significant fragmentation of the sagebrush ecosystem into many small isolated populations of sagebrush-obligate species.

Much of the remaining shrub-steppe habitat is degraded, fragmented, and or isolated from other similar habitats (Allen 2004, Vander Haegen et al. 2005). A large block of sagebrush steppe remains in only a few locations such as in Yakima County and Moses Coulee. These areas have been further fragmented by agricultural development. As a result of habitat fragmentation, less mobile populations of wildlife have been isolated from other populations of the same species. As the result of these vast burned areas and the invasion of cheatgrass and noxious weeds, there is now significant concern for many wildlife populations, particularly sage grouse, pygmy rabbit, and others as well. The wildlife populations in the fragmented habitats face great risk to their prolonged viability due to genetic isolation and general inadequacy of habitat quality and quantity.

The loss of habitat over large landscapes (McDonald and Reese 1998) has already greatly reduced populations of many species of shrub-steppe wildlife and native plants (Anderson and

Inouye 2001). These threats in combination have created an urgency to advance restoration and management of the remaining habitat. Additionally, the BLM has specific direction regarding sage-grouse habitat, with one of BLM's highest priorities being to implement the National Sage-Grouse Habitat Conservation Strategy on BLM-managed lands and related conservation actions in a consistent and effective manner (USDI-BLM 2004).

Definitions of Noxious Weeds, and Invasive and Undesirable Vegetative Species. Noxious weeds that are designated by state and/or federal agencies are aggressive, invasive species that can invade, spread, and dominate a site. The objective of weed treatments is to contain and prevent further spread of known and newly invading population of weeds through the appropriate level of weed control measures (early detection, treatment, control).

Invasive or undesirable species are defined as non-native or introduced species that out-compete native species and limit establishment of natives. The objective for treating invasive and undesirable species is similar to that of noxious weeds.

Analysis Area

The analysis area includes BLM management areas and scattered lands in parts of 13 counties in eastern and central Washington state (Douglas, Grant, Lincoln, Spokane, Yakima, Klickitat, Benton, Franklin, Chelan, Adams, Whitman, Okanogan and Kittitas)(see Map 1). Management areas in these counties, designated in the Spokane District Resource Management Plan (1987) and its amendment (1992), include: Juniper Forest, Saddle Mountains, Moses Coulee, Okanogan, Rock Creek, Yakima River Canyon and Upper Crab Creek. Any new acquisitions to BLM within this area would also be covered.

Conformance to Land Use Plans and Other Management Direction

The BLM would manage the project area lands according to applicable federal laws and regulations, including the Endangered Species Act of 1973, as amended; the Federal Land Management and Policy Act (FLMPA) of 1976; and the Spokane Resource Management Plan, Record of Decision (1987), as amended in 1992. Any acquired lands would be managed for multiple uses, pursuant to guidance in the Spokane RMP, including management for cultural and Native American resources, wildlife habitat, recreation, forest products, and livestock grazing.

The goals and strategies for controlling noxious weeds are consistent with the Scientific Assessment for the Interior Columbia Basin Ecosystem Management Project (ICBEMP)(USDA-USDI 1996).

Goals of Vegetation Restoration

Past Emergency Stabilization and Rehabilitation (ESR) projects, environmental assessments, and input from BLM staff specialists have identified the following goals for vegetation restoration:

- ✓ Re-establish native plant species and ecosystems.

- ✓ Re-establish special status species habitats.
- ✓ Maintain air quality (re-vegetate bare or burned areas to reduce blowing dust).
- ✓ Reduce soil erosion caused by wind and water.
- ✓ Improve coordination between the range program (range closures) and vegetation restoration.
- ✓ Improve success rates of fire rehabilitation projects.

II. Description of Alternatives

This EA evaluates two alternatives: Alternative 1 - Continue Existing Management (No Action), and Alternative 2 – Coordinated Treatment Program (Proposed Action). The Proposed Treatments and Design Features Section describe typical restoration treatments and mitigations that could be done under either alternative.

Alternative 1 - Continued Existing Management (No Action)

Alternative 1 (No Action) proposes continuing to stabilize and rehabilitate burned areas and ecosystem restoration projects as is currently being done. Under this alternative, management direction for burned areas and restoration projects would be developed individually through separate environmental assessments or other appropriate analysis document.

The primary difference between the two alternatives is that under Alternative 1, projects would be slower to develop and there would be less coordination between similar restoration projects.

Alternative 2 – Coordinated Treatment Program (Proposed Action)

Alternative 2 (Coordinated Treatment Program) proposes a full range of treatment options. The Proposed Treatments Section and Project Design Features Section describe typical restoration treatments and mitigations that would be used to determine appropriate treatments for site-specific project areas. The selected treatments and mitigations would be documented in a DNA or other analysis document to comply with the National Environmental Policy Act (NEPA).

Project sites for vegetation restoration would generally be small, less than 600 acres. Burned area stabilization or rehabilitation project areas could be several thousand acres in size.

III. Proposed Treatments and Project Development

This chapter applies to both alternatives.

Criteria for Project Development

The following conditions may indicate the need for restoration projects:

- ✓ Disturbed or burned areas that contain crucial habitat for wildlife and /or Special Status Species.
- ✓ Disturbed or burned areas where perennial grasses, shrubs, and forbs have been depleted and cannot reasonably be expected to re-establish.
- ✓ Disturbed or burned areas where shrubs have been depleted (or burned).
- ✓ Areas of undesirable, non-native vegetation and that are within crucial habitat for wildlife and /or Sensitive Species.
- ✓ Areas with overly dense sagebrush and little understory and that are crucial for wildlife and /or Sensitive Species.
- ✓ Areas where restoration is necessary to meet land use plan objectives.
- ✓ Areas where noxious weeds and non-native annual or perennial grasses are established or may become established, such as following fires or other disturbances.

Seedbed Preparation

Noxious Weed Treatments and Vegetation Manipulation

Seedbed preparation treatments are done to reduce competition from undesirable vegetative species and to increase germination and survival rates of desirable vegetation. Seedbeds may be prepared for vegetative seeding or planting by mechanical, chemical, biological and/or manual methods. In some areas where interplanting of shrubs or forbs is planned, no seedbed preparation will be needed.

Selection of one or more treatment methods (mechanical, chemical, biological, or manual) would be based on its appropriateness considering the following factors: growth characteristics of the undesirable plants (targeted for treatment), size and location of the project, accessibility of equipment, potential impacts to desirable plants (non-targeted for treatment), use of the area by people, effectiveness of the treatment on target species, and cost. Depending on a plant's characteristics, these methods may be used individually or in combination and over successive years.

The four methods for preparing seedbeds are described below, including reasons for basing selection on one or more of the four methods.

Mechanical

- *Mowing* may be used to reduce biomass or seed set of undesirable plants prior to harrowing.

- *Harrowing* may be used to break up compacted soil and smooth the soil surface or to remove plants from the surface. The harrow contains numerous "tines or teeth" that drag along the soil surface to disturb the upper 1 to 4 inches.

- *Disking* may be used to loosen soil, remove plants from the surface, or to incorporate the biomass into the soil.

- *Chisel plow* may be used to undercut the root systems of grass or other vegetation to 4-5 inches and to lock in soil moisture.

Chemical

- Herbicides and adjuvants (additives to herbicide mix) may be used to treat certain species of noxious weeds and undesirable or invasive plant species on areas identified for vegetation restoration, and to control invasive or noxious weeds on burned areas.

- Proposed chemical control would be consistent with treatments at project sites identified and analyzed in the Spokane District Noxious Weed Control Program site-specific environmental assessments (1989-2000). Treatments would be done in accordance with the Final Environmental Impact Statement (FEIS) for Vegetation Treatment on Bureau of Land Management Lands in Thirteen Western States (USDI-BLM 1991) and its forthcoming amendment. Herbicides would be applied in accordance with Program Implementation Features identified in Chapter 5, pages 8 and 10, of the Record of Decision for the FEIS, for Vegetation Treatment on BLM Lands in Thirteen Western States (USDI-BLM 1991).

- The herbicides and tank mixes approved in the Vegetation Treatment on BLM Lands in Thirteen Western States EIS (USDI, BLM 1991), or any approved through an amendment or other agency-approved process for use on BLM public lands, may be used to control noxious and invasive weeds. Selection of a herbicide and application rate for site-specific application would depend on its chemical effectiveness on a particular weed species, success in previous similar applications, habitat types, soil types, and proximity of the weed infestation to water and or private property.

- Ground-based application would occur in smaller, fragmented patches of weeds and along trails and roads where herbicide treatment may be the most effective means of controlling or eradication noxious and invasive non-native species. Ground-based herbicide application would include broadcast spraying from a pump unit on the back of a pickup truck, tractor, or an all-terrain vehicle; or spot spraying with backpack pumps. Pack animals may be used to transport and apply herbicides in more rugged terrains.

- Aerial herbicide application can be an effective means of controlling or eradicating very large infestation of noxious weeds and invasive or undesirable species, or for areas that have steep slopes, rocky soils, or difficult access.

- Aerial applications of herbicides are allowed within the constraints of the Vegetation Treatment on BLM Lands in Thirteen Western States EIS (USDI-BLM 1991.

- A combination of herbicides may be the most appropriate treatment where several species of noxious weeds occur together, or where the herbicides affect weeds differently. All chemical combinations would conform to herbicide labels.

- Public re-entry notices would be posted in all herbicide application areas, as outlined in herbicide use labels.

- Treated areas would be monitored to determine effectiveness of treatments and the need for further action. Additional follow-up treatments would be implemented if weed populations persist. Other effective noxious weed control methods may be proposed subject to meeting noxious weed control priorities.

- When herbicide use is proposed adjacent to surface water, buffer strips would be maintained in accordance with the Program Design Feature in the Record of Decision for the Vegetation Treatment on BLM Lands in Thirteen Western States (USDI-BLM 1991) or the updated EIS when finalized, and in accordance with the herbicide label.

- Herbicides would be applied according to the manufacturer's label specification to avoid herbicide volatility during periods of extreme heat.

- Herbicide applications would be implemented in accordance with the product manufacturer's label; all federal, state and local laws, rules and regulations; and by a qualified or licensed pesticide applicator.

- All herbicide and adjuvants proposed would be documented by an approved BLM Pesticide Use Proposal (PUP). All herbicides applied will be documented in a BLM Pesticide Application Record (PAR), to be completed within 24 hours of a pesticide application.

Biological

Factors to consider when selecting sites for biological control include:

- ✓ Present and future land use activities
- ✓ Climate
- ✓ Topography

BLM-approved biological control agents generally would be used on infestations where the objective is to decrease or control a noxious weed population over time. Generally, it takes a few years for populations of biological control agents to gain sufficient numbers to control a weed infestation.

Description of Biological Control: Biological control agents are living organisms that decrease the number of noxious weeds by reducing available nutrients, mutating, and feeding on targeted noxious weed species. The majority of the noxious weed species in the Pacific Northwest were introduced here without their natural enemies. Natural enemies (including insects, nematodes, mites, plants, pathogens and vertebrates) are collected in their country of origin from their host weed species.

These organisms (natural enemies) are introduced to the United States under the strict supervision and guidance of USDA/APHIS (Animal and Plant Health Inspection Service), which conducts studies to determine their host range. Agents that have a very limited host range under starvation feeding trials are approved for release into the United States. Biological control agents recommended in this proposal are known to be host-specific and are not known to attack other plant species.

Biological control projects are implemented in three phases, as described below:

- *Phase 1* - Conduct initial release of biological agents onto selected sites having an established noxious weed species.

- *Phase 2* - Monitor established insectary to determine effectiveness of the control measure and to track the spread of established biological agent populations.

- *Phase 3* - Collect biological agents from within established insectaries, and either redistribute insects to expand the range of the existing insectary or move insects to additional proposed sites to establish new insectaries.

Manual

Manual control (such as hand pulling, grubbing and cutting) may occur in all areas, including sensitive areas, to avoid adverse effects to non-target vegetative species or water quality.

Noxious weeds would be disposed according to proper disposal methods. Noxious weeds that have developed seeds would be bagged and properly disposed.

Seed Selection

Plant materials would be selected and seed mixtures designed to best meet objectives identified for the site-specific area, and according to any associated plans for the site-specific area. Native seed or native cultivars (native to the Northwest) would be used to meet these objectives when available.

Seeding Methods

Seeding could be done by mechanical, broadcast, or hand methods. Each of these methods is described below. The type of seeding method selected would be based on site-specific characteristics (such as soil type, rockiness, and slope), type of species planted, and equipment availability. A description of many seeding methods can be found in Monson et al. (2004 vols.1-2).

Mechanical

- *Rangeland drills* can be used in a broad range of applications. The disturbance caused by drill seeding consists of 1-2 inch deep furrows spaced at approximately 12-inch intervals.

Seeds are dropped into these furrows from a seed dispersal tube placed directly above each furrow. This seeding method is typically used in open, relatively flat topography that has very few larger rocks (8 to 10-inch diameter). This method works well in most soil types. Rangeland drills can be equipped with depth bands to control depth of furrow openings. Farm type drills are sometimes substituted for rangeland drills with similar impacts.

- *No-till drill* is used to (1) minimize mechanical impacts and soil disturbance, (2) place seed at proper planting depth, and (3) optimize seed-to-soil contact. The disturbance caused by a no-till drill consists of 1-inch furrows spaced at approximately 12-inch intervals. Seeds are dropped into the furrows from three separate seed feeder tubes. Seed can be separated into grass, forb, and shrub seed types. Press wheels follow the furrow to maximize seed-to-soil contact**.** The no till drill (or modified rangeland drill with depth bands) would be preferred on areas having good microbiotic crust cover.

- *A land imprint seeder* consists of a large drum with numerous V-shaped protrusions arranged around the circumference and is rolled over the ground to imprint small (approximately 4 by 18 inches) impressions in the soil surface. Seed is dispersed in front of the imprinter and pressed into the soil by the drum. The impressions trap additional moisture. This seeding method is best used in arid to semi-arid environments, and should not be used on clay soils.

- *Brillion type seeders* use two culti-packer rollers. The leading roller crushes soil clods and forms a smooth seedbed in front of the seed drop. The trailing roller firms the seed into the soil. The rollers are notched to create little pockets to trap moisture. Seed is dispersed uniformly, eliminating the row effect. The Brillion type of seeder is used in open ground with flat topography that is devoid of rocks.

- Other drill/seeder configurations are sometimes used with a combination of implements similar to discs, and culti-packers mentioned above with similar impacts.

Broadcast

- Ground broadcast seeding with a truck or all-terrain vehicle may be used in specific situations where the seeding area is small, or where the slope or rockiness makes mechanical seeding unfeasible.

- Aerial broadcast seeding may be used in specific situations where the seeding area is large, or where ground application is not feasible due to steep slope, rockiness, etc.

- Broadcast methods of seedbed preparation may not be as reliable as other methods when considering the soil-to-seed contact that is critical for successful vegetative establishment.

Hand

- Hand planting of riparian and upland tree, shrub, grass or forb seedlings would be used to establish specific species that do not establish easily through other methods.

- This method is usually limited to bare root or containerized stock.

- The disturbance associated with hand planting of plugs consists of an area within a 2 to 3-inch radius of the plant. For larger plants, scalping (removing all vegetation from an area to create a bare treatment area) may be necessary. Scalping a small area (1 to 3 square feet) is done either manually or chemically, prior to shrub planting to reduce vegetative competition.

- Planting equipment may include digging bars, hoedads, augers, and mechanical tree planters.

- Plantings may be done within areas having crucial wildlife habitats where shrubs, trees or forbs are needed to provide critical forage, or when habitat component and natural re-establishment is not expected to occur within a reasonable timeframe.

Seed Cover

Seed cover or mulch is used to increase the seed-to-soil contact to promote germination and survival rates of desirable vegetative species.

Protective Fences and Livestock Management

The success of revegetation often depends on exclusion of livestock. Livestock grazing would be deferred for at least two growing seasons, or until resource objectives are met through the closure of pastures, resting of allotments, or construction or reconstruction of protective fences.

Erosion Control

The objective of erosion control is to stabilize the hydrologic function of upland watersheds to; (1) trap sediment (2) capture, store, and safely release rainfall and snowmelt; and (3) minimize the risk of degrading water quality (Monson et al. 2004).

Treatments on Hill Slopes

- Contour tree felling or contour log terracing parallel to the slope may be done to trap sediment and improve infiltration, prevent slope rilling, and replace woody material consumed by fire.

- Lop and scatter--spreading out of tree limbs/branches and shrubs (logging slash) on a slope--may be used to protect bare soil from raindrop impact. Branches and limbs may be crushed or worked into contact with the soil surface to minimize concentrated surface runoff and to reduce erosion.

- Hand contour trenches may be dug to trap sediment, improve infiltration, and prevent slope rilling.

- Mulch may be used to retard overland water flow, protect soil from raindrop impact, and increase soil moisture-holding capacity.

- Straw bales or wattles (bale-type structure fabricated of various vegetative materials) may be placed on hill slopes to trap sediment, improve infiltration, and prevent slope rilling.

- Geotextiles (biodegradable erosion cloth/soil netting) may be used to stabilize slopes above high-risk areas such as campgrounds.

Treatments In and Near Stream Channels

- Treatments may be implemented in and near stream channels to modify sediment and water movement in ephemeral and naturally intermittent (seasonally flowing) or small, headwater channels to prevent flooding and debris torrents where downstream life, property, or resources need protection. Grade-control structures may also be used to capture and store sediment that would otherwise be transported down slope. In most situations, bio-engineering techniques (such as cuttings and willow wattles) that establish plants; or straw bale check dams, gravel bags, and straw wattles that pass sediment and decompose over time would be used to stabilize channels because these structures have the lowest potential to fail and result in damage to stream channels.

- Willow wattles and woody riparian cuttings (bio-engineering techniques) may be used instream for channel stabilization and grade control.

- Gabions may be used to trap sediment and control downcutting of severely eroded drainage areas.

- Straw bale and straw wattle check dams may be used to temporarily trap sediment and slowly release stored sediments as the check dam materials deteriorate.

- Log dams and in-channel felling (preferably using whole trees) may be used to slow water flow and trap sediment. Other treatments could include low-profile rock dams similar to those constructed in the past.

- Sandbags and low-profile log or rock grade channel stabilizers that pass sediment may be used to reduce streambank undercutting.

- Silt fences may be used to stabilize in-channel sediments, trap suspended sediments, and control downcutting. A factor to consider is that silt fences generally have a longer lifespan than straw bale check dams.

- Culvert repair, removal or replacement may be needed to restore proper drainage.

Closures

- Certain areas, roads and trails may be closed temporarily to protect project areas from disturbance, or for public safety.

- Burned or seeded areas may be temporarily closed to the public by excluding vehicle, bicycle, horse, and foot use to provide adequate protection of resources, or to provide public safety due to fire damage or Emergency Stabilization and Restoration activities.

- During the vegetative recovery period, public access within an Emergency Stabilization and Restoration project area may be temporarily limited (that is, access would be limited to existing roads and trails).

Repair or Replacement of Facilities

- Facilities such as structures, roads, and trails may be repaired or replaced to resolve health and safety concerns identified during implementation of emergency stabilization work in burned areas.

Prescribed Fire

- Follow the BLM Prescribed Fire Management Handbook - H-9214-1 (USDI-BLM.1998, online at <http://www.blm.gov/nhp/efoia/wo/handbook/h9214-1.pdf>).

- Conduct prescribed fire in conjunction with restoration projects in areas invaded by or at risk of invasion by annual, non-native vegetation and noxious weeds and juniper (Miller and Rose 1999).

- After implementing prescribed fire treatments, use chemical, mechanical, and seeding treatments with appropriate native plant materials to stabilize sites and prevent dominance of invasive, annual vegetation and noxious weeds and to restore a functioning ecosystem.

- Prescribed fire may be used to prepare areas for chemical, mechanical, and/or seeding treatments, or, for disposal of vegetation or accumulated litter.

- Where existing native vegetation conditions allow, use less intensive restoration and design vegetation treatments to simulate the effect of historical fire on vegetation structure and composition for fire adapted plants species (USDA 2002a, b, c, d, e).

IV. Project Design Features Applicable to Both Alternatives

Seedbed Preparation

- Seedbed preparation, herbicide application, and seed cover projects will run along the contours of the land, whenever possible and practical, to reduce erosion.

- Islands of native vegetation will not be disturbed.

- For herbicide application, see Design Features for Weed Treatment.

Design Features for Seed Selection

- Native species will be preferred, if available, and applied at rates applicable to: (1) site conditions, (2) management objectives, and (3) other resource considerations. Parameters such as soil properties, erosion potential, aspect, elevation, precipitation zones, invasive and noxious weed species competition, intended use, potential plant community; and seed availability will be evaluated in developing seed mixtures.

- Seed mixtures will be formulated to benefit wildlife and sensitive species habitats.

- All seed will be tested to ensure compliance with the USDA's *State Noxious-Weed Seed Requirements Recognized in the Administration of the Federal Seed Act*. All purchased seed must meet all requirements of: (1) the Federal Seed Act (7 USC 1551-1610),(2) Washington state seed laws, and (3) federal specification JJJ-S-181. All seed will be tested for purity and germination to meet contract specifications. All seeds should also be tested for weed and noxious-weed seed. Tested seed should be identified by certified varietal tags and source-identified tags to ensure the genetic origins of the parent plant material or the collection origin.

- Seed will be planted during the appropriate season, usually the fall, to ensure seed stratification, germination and establishment.

Design Features for Weed Treatment

- Herbicide type and application rate will depend on: (1) target species, (2) location of special status species and their crucial habitats, and (3) aquatic habitats. Herbicide use will conform to federally approved manufacturers' herbicide labels, as well as any streamside, wetland, and riparian habitat restrictions.

- All herbicide applications will follow manufacturer herbicide label instructions, specifications, and precautions; all federal, state and local laws, rules and regulations; and BLM policy. In instances where herbicide labels, federal, or state stipulations overlap, the more restrictive criteria will apply.

- Application of any herbicide will be performed by or directly supervised by a state or federal licensed applicator.

- No spraying of any herbicide will occur when wind velocity exceeds 8 miles per hour, per Washington Department of Agriculture standards.

- Dyes or foam may be used to obtain uniform coverage. This would help prevent under or over treatment/application, help detect drift, and also reduce the risk of treating non-target species.

- Herbicide applications will be implemented in a manner to avoid off-site movement of herbicides either through the air or soil, or along the soil surface. Project site terrain, soil

type, and vegetation will be considered when selecting herbicide type, application method, and application timing.

- All aerial herbicide application will be conducted in a manner that avoids application overlap and drift. "No Spray" buffers will be maintained 500 feet from inhabited dwellings, 100 feet from crops and barns, and 100 feet from water/riparian areas.

- A BLM Pesticide Use Proposal (PUP) will be developed and approved prior to commencement of any herbicide application. The BLM PUP will be consistent with site-specific analysis (such as a DNA) identifying any proposed vegetation treatments.

- If a temporary closure of an area is needed during plant establishment, the area will be posted with information regarding the restoration project, contact phone numbers, and the approximate closure time. Areas to be sprayed will be posted with spray information and contact phone numbers. Spraying applications will consider recreational use of the areas and attempt to spray during lower use times.

- No vehicle-mounted boom sprayers or handguns would be used within 25 feet of water.

- Ground-based herbicide applications would be implemented to avoid disturbing raptor nesting sites.

Design Features for Fencing

- Where possible, use existing fences to exclude disturbance that would jeopardize the project objectives. Such disturbance may include cattle, recreational use or problem wildlife. Sign all fences with gate closure information.

- Fences used to protect sites recovering from vegetation restoration will be designed to allow for non-problem wildlife passage.

- Fence construction and reconstruction will conform to BLM Handbook specifications in H-1741 (USDI, BLM 1989 and Supplements).

Design Features for Erosion Control

- Only certified weed-free straw will be used in straw bales and to construct straw wattles.

- Any onsite materials to be used in erosion control treatments will be collected in a manner that avoids negative impacts to riparian areas.

Design Features for Water Quality and Riparian Areas

- Riparian tree and shrub seedlings or herbaceous plugs will be planted, where needed to provide long-term canopy cover for shading streams from direct solar radiation, or to provide streambank stability to maintain water quality and protect beneficial uses.

Design Features for Facilities Repair/Replacement

- Road treatments such as properly spaced rolling dips, waterbars, and culverts may be used to move water past the road prism and to more effectively route water and sediment to prevent additional erosion, road damage, slope failures, and delivery to streams.

- Culverts will be inspected, maintained, repaired, or replaced following storm events.

- Old roads could be ripped or disked to increase infiltration.

- Armoring of crossings, culverts, and channels protects water quality and may be used to provide mechanical strength and protection. Typically, armor is installed in some form of riprap at locations where bridges or culverts require protection from flood flows.

- Public use facilities, structures, roads, and/or trails that pose a health or safety risk can be stabilized or closed to public use to protect human health and public safety.

- Public notices or signs necessary to close trails, warn of pending floods, promote public safety, or otherwise assist with rehabilitation actions (directional, road, danger signs) may be posted or installed.

- Hazardous material may be removed.

- Downed trees that create obstructions and pose a threat to trail users may be moved or removed.

Design Features for Sensitive Resources

Special Status Species - Vegetation

- Field inventories for Special Status Species of plants will be required when site-specific projects are proposed. If Special Status Species of plants are identified, project plans will be designed to avoid or minimize the effects.

- Requirements for individual Special Status Species of plants will be considered when selecting seed mixes, chemical herbicides, and application methods. Native seed will be used when possible and available in Special Status Species plant habitat. Seeding techniques that minimize soil disturbance will be preferred.

- Non-herbicide treatments, spot spraying of herbicides, and/or spray buffers around Special Status Species of plants will be considered as preferred methods to minimize risk.

Special Status Species - Terrestrial Wildlife

- Site-specific project plans will use the January 2004 Version 2.1 Interagency National Fire Plan Consultation Process and summary worksheets available online at

<www.or.blm.gov/fcp> to verify that site-specific proposals would not adversely affect any ESA-listed wildlife species or designated critical habitat.

- The biological assessment for the Spokane District (USDI-BLM 2002) will also apply to all projects.

- Inventories and biological assessments will be completed for special status wildlife (Table 1) and their habitats, including Washington ground squirrel and sage-grouse, prior to implementation of all ground disturbing and/or noise generating activities and herbicide treatments.

- Bald eagles will continue to be managed under the provisions of bald eagle recovery plans and the Draft National Bald Eagle Management Guidelines (2006). All disturbance will be managed according to the Bald and Golden Eagle Protection Act and the Bald Eagle Proposed Rule (50 CFR Part22) that redefines the term disturb.

- Seasonal restrictions for activities are summarized in Table 1.

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Greater Sage-grouse, Columbian Sharp-tailed Grouse, Pygmy Rabbit, and Other Sagebrush Obligates – Considerations for these species will generally follow guidance in the following: (1) Greater Sage-Grouse Recovery Plan (Stinson et al. 2004); (2) Bureau of Land Management National Sage-Grouse Habitat Conservation Strategy (USDI-BLM 2004); and the Conservation Assessment of Greater Sage-Grouse and Sagebrush Habitats (Connelly et al. 2004). The following project design features will be considered in potential sage-grouse, sharp-tailed grouse, or pygmy rabbit habitats:

- Standing dead juniper, ponderosa pine or other trees that could provide raptor perches may be felled to protect pygmy rabbit (*Brachylagus idahoensis*), greater sage-grouse (*Centrocercus urophasianus*), and Columbian sharp-tailed grouse (*Tympanuchus phasianellus columbianus*) from predator risk.

- New fences will not be constructed within 400 yards (approximately 0.25 mile) of currently used, unburned sage-grouse leks, and will be flagged to increase visibility.

- Old fencing will be removed to reduce mortality of birds from flying into fences, and from predator risk as fence posts are sometimes used as hunting perches by raptors and ravens for hunting pygmy rabbits, grouse or other species.

- Berry-producing, riparian shrubs may be planted to rapidly rehabilitate Columbian sharp-tailed grouse winter habitat.

- A minimum of two native forbs species will be used on restoration projects within the current range of the sage-grouse when feasible and available

Washington Ground Squirrels – All restoration activities, including ground-disturbing activities and the use of chemicals such as herbicides within the range of Washington Ground Squirrels (*Spermophilus washingtoni)* will require planning consideration as identified below.

- Where practical, surveys will be completed. Where active burrows are located, a 300-feet radius, no ground-disturbance buffer will be placed around the colony.

- No treatments will occur within known or suspected Washington ground squirrels habitat during the reproductive season (mid-March through the end of April).

- Structures such as fences proposed for construction or reconstruction within 0.5 mile of suitable Washington ground squirrel habitat will be designed and implemented to avoid increased opportunities for predation on ground squirrels.

- Potential impacts will be evaluated by a biologist for the entire active period (February 1 to July 30) in active colony areas.

- Proposed seed mixtures will contain a minimum of two native forb species in the historic range of Washington Ground Squirrels when feasible and available.

Yellow-Billed Cuckoo and Other Riparian Obligates - Restoration activities will be implemented to minimize impacts to onsite or adjacent native vegetation or other riparian functions. Restoration will be used to re-establish or enhance burned riparian vegetation that could be potential yellow-billed cuckoo nesting habitat. This could include establishment of native riparian tree species, such as cottonwood (*Populus* spp.*)* and willow (*Salix* spp.), where feasible and appropriate.

Raptors - Trees containing raptor nests will not be felled, and nesting platforms will be installed if known nest trees are destroyed. Special emphasis will be given to ferruginous hawk territories (Richardson et al. 2000).

Bald Eagle – Restoration will be used to re-establish large native riparian tree species such as cottonwoods or ponderosa pine trees in the uplands to enhance existing bald eagle roosting and nesting habitats when these trees have been lost by fires or other human activities.

Big Game - All new fences within big game habitats will be designed and constructed to consider and facilitate passage of big game (USDI-BLM 1989 and supplements), including bighorn sheep, moose, white-tailed deer, mule deer, and elk.

Long-billed Curlew - Short-stature grass species will be the primary seeded species used, where practical, in occupied long-billed curlew (*Numenius americanus*) habitat that is dominated by annual grasses. Surveys will be completed for this species, and nest sites will be buffered for 300 feet from disturbance where activities are proposed in curlew habitat areas during their nesting season.

Western Burrowing Owl - Colonies of western burrowing owls are known to occur in scattered locations over much of the Spokane District; however a district-wide survey has not been completed. Prior to ground-disturbing activities, when practical, surveys for these owls will be completed. Any burrows identified will be buffered by a 300-feet, no disturbance buffer. Active burrowing owl nests should not be directly sprayed with any herbicide.

Table 1. Seasonal Restrictions on Treatment Activities Near Important Wildlife Areas			
Seasonal Restriction*	**Restriction**	**Distance**	**Species of Concern**
March 1 - May 15	No ground-disturbing treatment.	Within 0.5 mile of currently used, unburned leks	Columbian sharp-tailed and sage grouse
March 1 - May 15	No ground-disturbing activities prior to 10 A.M., unless authorized by a biologist.	Within 2 miles of a lek	Columbian sharp-tailed and sage grouse
March 1 through June 30	Avoid all physical and audible disturbances prior to 10 A.M.	Within 1mile of active leks	Columbian sharp-tailed and sage grouse
December 1 through February 15	No ground-disturbing treatments.	0.5 mile of currently occupied, unburned winter habitats	sage-grouse
March 15 to April 30	No ground-disurbing treatments.	Within known colonies	Washington Ground Squirrel
February 1 through June 30	No ground-disturbing treatments., unless authorized by a biologist.	0.5 mile of an active nest	golden eagle
January 1 – August 15	No ground-disturbing treatments,. unless authorized by a biologist.	0.5 mile of an active nest	any raptor
March 1- May 31	No ground-disturbing or noise disturbance treatments. unless authorized by a biologist.,	Within 820 feet of active nests	ferruginous hawk
November 1 through March 1	No ground-disturbing treatments.	0.5 mile of winter active roosts.,0.25 mile of winter concentration sites.	bald eagle
January 1-August 15	No ground-disturbing treatments,. unless authorized by a biologist.	0.5 mile of an active nest	bald eagle
November 1 - March 1	Design aerial seeding and aerial herbicide application for no impact.	Within 0.5 mile of winter concentration sites.	bald eagle
April 15 through June 30.	Minimize noise disturbance.	1 mile of an active den or rendezvous site	gray wolf (*Canis lupus*)
March 15 to May 30	No physical disturbance to soil or vegetation.	300 feet of an active nest	long-billed Curlew
March 15 to May 30	No physical disturbance to soil or vegetation.	300 feet of an active nest	Western burrowing owl
*These dates are approximate and could be changed with concurrence of a Wildlife Biologist based on field survey. Also, limited operating periods may be allowed within restriction dates with concurrence of a biologist.			

Special Status Species - Aquatic Wildlife

Aquatic wildlife in this category includes the ESA-listed and candidate species – Upper Columbia Spring Chinook (Oncorhynchus tshawytscha), Upper Columbia River ESU steelhead (Oncorhynchus mykiss), bull trout (*Salvelinus confluentus*), Columbian spotted frog (*Rana luteiventris*), as well as other species of concern such as redband trout (*Oncorhynchus mykiss gairdneri*) and northern leopard frog (*Rana pipiens*).

- Additional site-specific ESA Section 7 consultation will be required for any treatment within riparian habitats adjacent to any streams having listed or proposed species (including bull trout), and that may likely adversely affect these species. This requirement applies to all in-stream work such as culvert/bridge repair or replacement.

- Site-specific project plans will use the January 2004 Version 2.1 Interagency National Fire Plan consultation process and summary worksheets available online at <www.or.blm.gov/fcp> to verify that site-specific proposals would not adversely affect Chinook, steelhead bull trout or proposed critical habitat. Any treatment likely to adversely affect listed salmon, steelhead or bull trout (USFWS 2002) or the proposed critical habitat will require site-specific ESA Section 7 conference as identified in *A Framework to Assist in Making ESA Determinations of Effect for Individual or Grouped Action at the Bull Trout Subpopulation Watershed-Scale* (USFWS 1998).

- Ground-disturbing activities will be designed and implemented to avoid any impacts to proposed critical habitat of aquatic special status species listed salmon, steelhead or bull trout. Impacts to be avoided are disturbance or habitat modification, including decreased water quality.

- Aerial seeding within or upstream of riparian habitats that contain special status aquatic animals will be limited to seed mixtures with no added chemicals such as fertilizer.

- To re-establish or enhance existing riparian habitat for aquatic species and proposed salmon, steelhead or bull trout critical habitat, re-establish native riparian plant species such as sedges, rushes, cottonwood and willow by planting of cuttings or plugs.

- Fence construction will be designed and implemented to avoid impacts to water quality and riparian vegetation associated with livestock use within or upstream of riparian habitats.

Design Features for Cultural and Paleontological Resources

- Consultation regarding specific projects will be initiated with the State Historic Preservation Officer (SHPO) and the Tribal Historic Preservation Officer (THPO) when proposed treatments are identified.

- Consultation will include the Yakama Indian Nation, the Colville Confederated Tribes, the Wanapum Band of Indians, the Confederated Tribes of the Umatilla Reservation, the Spokane Tribe of Indians, interested publics, and the Department of Archaeology and Historic Preservation. Maps and a description of the area of potential effect (APE) will

be sent to the Tribes and the Department of Archaeology and Historic Preservation (DAHP) as part of notification and consultation procedures.

- Field inventories commensurate with the proposed treatment will be conducted prior to project implementation, and the results (including recommended actions) will be sent to the State Historic Preservation Officer and the Tribal Historic Preservation Officer for review.

- Database searches, as well as literature and document review, will be conducted to help identify past uses of the area and the potential for cultural resources, including properties of traditional religious and cultural importance.

- Any significant cultural properties encountered during project implementation will be protected from potential disturbance by the following measures: avoidance, project redesign, protective barriers and other mechanisms to prevent any impacts to the cultural resource. In addition, any potentially significant cultural resources discovered during implementation of this project will result in cessation of project activity in the area of the resource and notification of a BLM archaeologist. The find will be protected until it is assessed in consultation with the Department of Archaeology and Historic Preservation and the consulted Tribes.

- All areas where ground-disturbing projects are proposed to use harrows, rangeland drills, disks, chisel plows, or similar implements will be surveyed using Class III methods. If ground visibility is poor and there is potential for subsurface cultural materials, sub-surface testing may be necessary to determine if such resources are present. If important cultural or paleontolgoical resources are located, the project will be redesigned to avoid any impacts to the cultural resource. Consultation with Native American Tribes and the Department of Arhcaeology and Historic Preservation will take place prior to any ground-disturbing activity.

Monitoring

The treated areas would be considered recovered when the following two conditions are met:

- ✓ The majority of desired herbaceous perennial plants are producing seed.
- ✓ The individual Restoration Plan objectives have been met.

All restoration plans would include treatment monitoring to: (1) determine if plan objectives were met, (2) establish the need for additional treatments, and (3) document monitoring results for future adaptive management plans.

Methods used to monitor the treated area may include field observation, frequency transects, photographic plots, and cover transects utilizing the line-point intercept and density plot methods. The success of vegetation control (herbicide) and establishment and persistence of seedlings would be monitored.

Prescribed burn treatments would be monitored according to the Spokane District Prescribed Burn Monitoring Protocol. This monitoring is designed to establish adaptive management for future prescribed burn treatments.

V. Affected Environment

Soils and Topography

The Columbia Basin soils largely overlay basalt bedrock. These soils are formed by an alluvium and residuum and slope alluvium derived from basalt and welded ryholitic tuff. These soils are shallow to moderately deep and well drained and have a xeric or xeric bordering aridic soil moisture regime, and a mesic to frigid soil temperature regime.

The diversity in these soils comes from variability in slope, aspect, elevation, climate and vegetative communities. These multiple watersheds are found in the Volcanic Plateaus, Hills and Plains physiographic region. Elevations range from 700 to 3,500 feet. Soils in these areas occur on nearly level to very steep, dissected sedimentary terraces.

Annual precipitation in the Columbia Basin in Washington ranges from less than 7 inches near the Tri-cities to greater than 12 inches near Waterville. The major drainages include Crab Creek, Yakima River, and Douglas Creek. All drain into the Columbia River.

Air

Under the Clean Air Act (as amended in 1990), BLM-administered lands were given Class11 air quality classification. This classification allows for moderate deterioration associated with moderate, well-controlled industrial and population growth. Strong winds may carry large amounts of dust from fallow agricultural fields and can cause reduced visibility.

Vegetation

Uplands

Shrub-steppe communities are found on deeper soils within the project area. Big sagebrush-bluebunch wheatgrass is the dominant community type with big sagebrush-Idaho fescue found on north aspects or in areas with the higher range of precipitation. Bitterbrush-bluebunch wheatgrass community type is found on sandier soils.

Perennial grasslands (often created by wildfires that destroy fire-intolerant shrubs) are interspersed with shrub-steppe communities. In areas that have been highly disturbed, annual grasses such as cheatgrass may dominate.

Rigid sagebrush, buckwheats and Sandberg bluegrass are found on areas with shallow soils over basalt, lithosols. These areas tend to occur on ridge tops. Scattered ponderosa pine and Douglas fir may be found at the highest elevations.

Riparian

Cottonwood, birch aspen and willows with an understory of sedges and grasses are found along perennial streams. Seasonal creek riparian zones are dominated by serviceberry, mock orange, rose and grasses. Some low areas generally support wetlands, marshes and wet meadows, especially in the eastern portion of the Spokane District.

Invasive Non-Native Plants

In addition to cheatgrass invasions, there are various noxious weeds listed by the state of Washington, including diffuse knapweed, Russian knapweed, Dalmatian toadflax, Canada thistle, bull thistle, whitetop and musk thistle. This is especially true in disturbed or degraded areas such as roads, trails, and livestock developments. Some areas recently acquired into BLM ownership are old agricultural fields or Conservation Reserve Program fields (CRP) lands usually with non-native perennial grasses.

Sensitive Plant Species

The special status plant list includes Endangered Species Act (ESA) listed, Proposed and Candidate species; BLM sensitive and assessment species; and State Endangered, Threatened and Sensitive species. Specific species will be identified in site-specific project analysis.

Wildlife

General Terrestrial Wildlife

Mule Deer, White-Tailed Deer, Black-Tailed Deer and Elk

Mule deer occur in a wide variety of habitats throughout the Spokane District, including all the major upland and riparian cover types. White-tailed deer occur in a limited area in Okanogan and Spokane County; black-tailed deer occur in a limited area in Yakima County around Goldendale. Elk occur primarily in Yakima County along the Yakima Canyon. Although resident mule deer occur at lower elevations year around, a migratory portion of the population occupies lower elevations in winter months, then move to higher elevations during spring, summer, and fall.

Deer browse on a variety of grasses, forbs, and some shrubs throughout the spring and early summer (Wallmo 1981), but mule deer and elk gradually shift to a diet that is progressively higher in shrubs beginning in mid-to-late summer and on through winter as herbaceous vegetation cures and becomes less palatable. Elk tend to consume a diet higher in grasses year-long, but also begin to consume more woody vegetation in the late summer and fall through winter (Thomas 1982).

There is crucial mule deer and elk over-wintering habitat in certain areas near the Cascade foothills. The over-wintering habitat generally occurs along the ridgelines of lower foothills and river breaks. Antelope bitterbrush (*Purshia tridentata*), Saskatoon serviceberry (*Amelanchier alnifolia*), sagebrush, and other shrub species provide important forage and cover that is especially important when deep snows cover grasses and forbs. Annual grasses and other early maturing grasses also provide important late-winter forage, especially on windswept ridges.

Migratory Birds

A diverse number of neotropical birds occupy all habitat types on a seasonal basis. Many of these species are on the BLM and Washington Department of Wildlife special status species list.

Long-billed curlew nesting habitat occurs in parts of the Rattlesnake Hills and Saddle Mountains in particular. At lower elevations, these habitats generally consist of Wyoming big sagebrush and shrub-steppe habitats that have burned in the past and are now dominated by invasive annual grasses, or seeded to crested wheatgrass. Curlews are also occasionally observed nesting at mid-elevations in recent burns, low sagebrush, and meadow complexes. Habitat for this species has likely increased over the last several decades, as a result of the increased size and frequency of fires that have converted large areas of shrub-steppe to grasslands.

Sagebrush Obligate Wildlife

Pygmy rabbits (Musser and McCall 2000), Columbian sharp-tailed grouse, and greater sage-grouse along with other sagebrush obligate species such as sage sparrows (*Amphispiza belli)* and Brewer's sparrows *(Spizella breweri)*, as well as a diversity of other neotropical migrants, depend on sagebrush habitats for their survival (McAdoo et al. 2004). Populations of many of these species have decreased along with the decrease in the quality and quantity of sagebrush cover types throughout the Spokane District (Schroeder et al. 2000a, 2000b).

Other Terrestrial Wildlife

A large number of other species, including a variety of mammalian predators; small mammals including bats, shrews, rodents, rabbits, and hares; waterfowl; non-native game birds including California quail (*Callipepla californica*), chukar (*Alectoris chukar*), gray partridge (*Perdix perdix*), and ring-necked pheasant (*Phasianus colchicus*); and a variety of reptiles and amphibians also occur throughout the Spokane District. Every vegetation community type within the district provides important year-long or seasonal habitat for some combination of these animals.

Special Status Terrestrial Wildlife

The BLM special status species are: (1) those listed in the Endangered Species Act as threatened, endangered, proposed for listing and candidate species, and (2) BLM sensitive species. Listed and proposed species may also have ESA-designated proposed critical habitat. The BLM directs additional intensive management toward these species.

See Table 2 for a list of those special status species known to occur within the 13-county area addressed in this programmatic document.

Bald Eagle - Bald eagle seasonal habitat occurs throughout the District with the majority of nesting, brood rearing and winter habitat use near major rivers.

Bats - All special status bat species use natural caves and cracks in rock outcrops or man-made cavities for breeding, rearing, and/or hibernating. There is limited specific information related to breeding colonies of these species in the Spokane District. Potential breeding and hibernating habitat is considered common in abandoned mines, mountains and rocky areas. Bats depend on insect prey, and the best potential for insect prey occurs near wet meadows, open waters and marshlands. Wildfires would generally reduce flying insect densities associated with shrubby upland and riparian communities.

Western burrowing owl - Colonies of western burrowing owls have been observed in the District; however, a district-wide survey has not been completed. These owls require open terrain with low vegetation, burrows created by mammals, and an adequate prey base. Burned sites would have decreased value for owls due to decreased prey density.

Yellow-billed cuckoo – Although this cuckoo is still relatively common east of the crest of the Rocky Mountains, biologists estimate that more than 90 percent of the bird's riparian (streamside) habitat in the West has been lost or degraded. The yellow-billed cuckoo is a secretive robin-sized bird that, in the western United States, nests and breeds in willow and cottonwood forests along rivers. Its diet consists primarily of large insects such as caterpillars and cicadas, as well as an occasional small frog or lizard.

Northern leopard frogs and spotted frogs – These frogs are associated with springs, slowly moving streams, marshes, bogs, ponds, canals, and reservoirs (Stebbens 1985).

Table 2. Potential Effects of Fire and Restoration Projects on Various Wildlife Species

Animal Type **Common Name**	***Likelihood of wildfire to affect habitat***	***Habitat use within habitat affected by fire***	***Distribution in Spokane District***	***Status****	
				Federal	***BLM***
Birds					
American Peregrine Falcon	*Low*	*Nesting/Foraging Cliffs/nearby shrub-steppe and Ag lands*	*A few points*	Fed SC	BS
Bald Eagle	*Low*	*Nesting/Foraging Pine trees/Riparian shrublands in winter*	*A few points*	FT	
Ferruginous Hawk	*High*	*Nesting/Foraging Juniper trees; nearby shrub-steppe*	*A few points*	Fed SC	ST
Greater Sage Grouse	*High*	*Nesting/Foraging in Shrub-steppe*	*Uncommon*	Fed SC	
Greater Sandhill Crane	*Low*	*Foraging in shrub-steppe*	*Uncommon*	Fed SC	SE
Burrowing Owl	*High*	*Nesting/Foraging in Shrub-steppe*	*Uncommon*	Fed SC	SC
Yellow-Billed Cuckoo	*Low*	*Nesting/Foraging in Riparian Cottonwood*	*Very Rare*	FC	SC
Sharp-Tailed Grouse	*High*	*Nesting/Foraging in Shrub-steppe*	*Uncommon*	Fed SC	ST
Willow Flycatcher	*High*	*Nesting/Foraging in Willows and Riparian Areas*	*Uncommon*	Fed SC	

Table 2. Potential Effects of Fire and Restoration Projects on Various Wildlife Species					
Animal Type **Common Name**	***Likelihood of wildfire to affect habitat***	***Habitat use within habitat affected by fire***	***Distribution in Spokane District***	***Status**** ***Federal***	***BLM***
Loggerhead Shrike	*High*	*Nesting/Foraging in Shrub-steppe*	*Fairly common*	Fed SC	SC
Mammals					
Canada Lynx	*Very Low*	*Possible transient in Shrub-steppe*	*Very Rare*	FT	
Gray Wolf	*Very Low*	*Possible transient in Shrub steppe*	*Very Rare*	FT	
Pygmy Rabbit (Columbia Basin segment)	*High*	*Denning/Foraging in Shrub-steppe*	*Very Rare*	FE	
Washington Ground Squirrel	*High*	*Denning/Foraging in Shrub-steppe*	*Fairly common*	FC	
Western Gray Squirrel	*Moderate*	*Denning/Foraging in Pine and Oak, along edge of Shrub-steppe*	*Uncommon*	Fed SC	
Pallid Townsend's Big-Eared Bat	*Low*	*Denning/Foraging in Shrub steppe, usually in rocks*	*Uncommon*	Fed SC	
Pacific Townsend's Big-Eared Bat	*Low*	*Denning/Foraging in Shrub-steppe; usually in rocks*	*Uncommon*	Fed SC	
Yuma Myotis	*Low*	*Denning/Foraging in Shrub-steppe; usually in rocks*	*Uncommon*	Fed SC	
Amphibians					
Columbia Spotted Frog	*Low*	*Denning/Foraging in Shrub-steppe; close to water*	*Uncommon*	Fed SC	
Oregon Spotted Frog	*Low*	*Denning/Foraging Shrub-steppe; close to water*	*Uncommon*	Fed SC	
Northern Leopard Frog	*Low*	*Denning/Foraging in Shrub-steppe, close to water*	*Uncommon*	Fed SC	

**Federal Status: Fed SC = Federal Species of Concern; FT = Federal Threatened; FE = Federal Endangered; FC = Federal Candidate*

BLM Status: BS = Bureau Sensitive; ST = State Threatened; SE = State Endangered

Recreation

A wide variety of recreation occurs throughout the project area. Recreation use takes place at both developed and undeveloped areas and includes camping, hunting, off-highway vehicle riding, hiking, horseback riding, and fishing. Most visitors are from nearby communities, although several areas (such as Chopaka Lake, Palmer Mountain, Yakima River Canyon, Cowiche Canyon, and Douglas Creek) attract visitors from other states and countries. The BLM use estimates indicate that public use of BLM areas is continuing to grow as areas become better known and the state's population increases.

Cultural and Paleontological Resources

The sagebrush-steppe restoration Area includes lands in the traditional territories of the Confederated Tribes of the Colville Reservation, the Spokane Tribe of Indians, the Wanapum

Band of Indians, the Yakama Indian Nation, and the Confederated Tribes of the Umatilla Indian Reservation.

The restoration area is near the center of the territory that twentieth century ethnographers have defined as the "Plateau Culture Area." Numerous bands of Native Americans comprised this culture area in the Columbia Plateau. At the time of first contact with European cultures, these Native American societies shared many cultural traits. Among these was a heavy emphasis on use of the salmon whose annual runs in the major rivers were an important source of storable food. Human settlement patterns in the Plateau featured movement to fishing locations during the spring and summer runs, late summer and fall relocation to upland berry harvesting and hunting areas, winters spent in sheltered areas near carefully stored supplies of dried salmon and other foods, and springtime trips to the open, rocky areas that produced edible roots. These traditional subsistence activities remain important in the lives of many modern Native American people.

Evidence of the long Native American presence in the Columbia Basin is widespread and includes sites and features such as hunting camps, villages, lithic scatters, rock art, and other cultural features.

Many plant species occurring within the sagebrush-steppe restoration area can be used as sources of food, medicine, fibers, and dyes. Ethnobotanically and culturally significant plants common to the sagebrush-steppe restoration area include: balsamroot (*Balsamorhizza sagittata*), biscuit roots (*Lomatium spp*.), serviceberry (*Amelanchier alnifolia*), choke cherry (*Prunus virginiana*), wax currant (*Ribes cereum*), western virgin's bauer (*Clematis ligusticifolia*), wild rose (*Rosa spp*.), willow (*Salix spp*.), sumac (*Rhus glabra*), red-osier dogwood (*Cornus stoloinifera*), horsetail (*Equisetum sp.),* Oregon grape (*Berberis spp*.), death camas (*Zigadenus venosus*), common yarrow (*Achillea millefolium*) stonecrop (*Sedum sp.*) sagebrush mariposa (*Calachortus lyallii*), heartleaf arnica (*Arnica cordifolia*), brodiaea (*Brodiaea sp*.), miners lettuce (*Montia perfoliata*), hoary chaenactis (*Chaenactis douglasii*), sumac (*Rhus glabra*), blue elderberry, salsify (*Tragopogon dubius*), giant wildrye, star tulip (*Calochortus lyalli*), and alum root (*Heuchera cylindrica*), and Great Basin wildrye (*Elymus cinereus*).

Euro-Americans arrived in the Columbia Basin by the early 1800s. These were primarily trappers, traders, explorers and missionaries. By the mid-1800s, an influx of ranchers, miners, farmers and homesteaders occurred in the area. Evidence of their activities can still be seen across the landscape in the form of historical trails and wagon roads, fences and rock walls, railroads, camps, trash scatters, structures, foundations, and other cultural resources.

No paleontological resources are known to occur in the project vicinities. However, both vertebrate and invertebrate fossils have been reported in nearly every county of the project area. They range from relatively young Pleistocene fauna and flora such as the Columbia Mammoth with over 100 fossil localities in the Columbia Basin, to Cambrian-aged invertebrates including 500 million-year-old trilobites found recently in eastern Spokane County.

VI. Environmental Consequences

This chapter describes potential environmental consequences that would result from implementing the No Action Alternative and the Proposed Action Alternative described in Chapter II (Description of Alternatives).

Resources would likely be affected in a similar way under both alternatives; therefore, to avoid redundancy, the Alternative 1 analysis is briefly discussed to emphasize the impacts of completing fewer projects over time and fewer acres treated - a difference in scale and intensity of treatment over time.

Soils and Topography

No Action **-** If restoration is delayed, there would be no short-term changes in the current health of the watershed. Soil erosion would remain unchanged in burned areas and in crested wheatgrass fields. In areas where there is bare ground or ground occupied with shallow-rooted plants (annuals), the level of erosion and soil loss presently occurring would continue. Infiltration rate of water would remain unchanged.

The No Action Alternative could result in an increased risk of long-term surface soil erosion if projects are delayed and eventually not completed. Sites most at risk would be those in the critical and severe erosion condition classes and those areas with the highest degree of slope. Those sites that naturally revegetate at a slower rate could be at a greater risk for short-term surface soil erosion.

Proposed Action - Restoration treatments would be prescribed on a site-specific basis. The benefits of seeding are considered to be long term. All seeding methods generally have a low probability of reducing erosion the first year, because most benefits of seeding occur after germination and root development. After the area is rehabilitated and the ground cover becomes re-established, soil erosion would be similar to that of the pre-restoration landscape for crested wheatgrass fields. Erosion would be reduced in areas were bare ground or shallow rooted plants are replaced with perennial grasses that have extensive root systems for holding soils.

Mechanical seedbed preparation, prescribed burning, seeding, weed control, fencing, and off-highway vehicle traffic associated with restoration treatments could create some short-term compaction and disturbance impacts to the soil surface. The no-till drill or a modified rangeland drill with depth bands and hand seeding would have fewer short-term impacts than other mechanical methods used to prepare soil for seeding. Rangeland drilling, harrowing and chisel plowing would have the highest short-term soil impacts, because these methods would expose the soil surface to wind erosion.

Using the imprinter on sandy soils could create impressions that trap water, reducing overland water flow. However, using the imprinter on clay soils could cause surface compaction, sealing the soil surface. Surface sealing would trap water, but not allow it to infiltrate, so the moisture would be lost through evaporation.

Using the no till drill or modified rangeland drill with depth bands on areas with good microbiotic crust cover or in areas where soil erosion is a major concern would protect the remaining crust.

Although mechanical treatments and prescribed burns pose a variety of potential short-term soil impacts (including compaction, soil loss, and productivity loss), the long-term benefits from re-establishing perennial native vegetation would quickly outweigh the short-term disturbances. In the long term, re-vegetation would improve soil conditions and reduce sedimentation and subsequently water quality. Controlling annual grasses and establishing native perennial vegetation would result in more natural fire cycles that are less damaging to soil and produce less erosion in the long term.

Broadcast seeding would not pose short-term soil erosion. In areas where broadcast seeding is not as effective as mechanical methods in establishing vegetation, there would likely be more bare soil or shallow rooted (annual) plants that have a higher erosion potential.

The presence of biological crusts in arid and semi-arid lands have a very significant influence on the soil environment by reducing soil erosion (both wind and water), fixing atmospheric nitrogen, retaining soil moisture, and providing a living organic surface mulch. These crusts consist of "complex associations of bryophytes (mosses and liverworts), lichens, cyanobacteria, microfungi, algae and bacteria occurring as a thin layer on and just beneath the soil surface in arid and semi-arid landscapes (West 1990)." They can be used as an indicator of rangeland ecological health.

According to Hilty et al. (2004), "active revegetation with perennial species that encourage the growth of biological soil crusts is critical on many burned sites to prevent dominance by non-native, weedy vegetation." Also, according to Hilty et al. (2004), "results indicate that seeding is necessary to facilitate recovery of biological soil crusts." These biological crusts are necessary to hold soil particles together and reduce erosion.

Air

No Action - Under this alternative, there would be no change in short-term or long-term air quality, except in the event of large wildfires. Large burned areas left untreated could result in a short-term loss of air quality from blowing ash and loose soil until natural revegetation occurs. This re-vegetation could occur at a variable rate, extending from the first spring after the burn, to several years later in areas that burn very hot.

Proposed Action – Soil-disturbing activities (such as mechanical seedbed preparation, seeding and weed treatments) could reduce air quality for a short duration.

The herbicide label restrictions and the proposed design criteria based on distance from open water, wind speed and direction, and public notification would protect human health during aerial herbicide applications to the extent practicable.

Prescribed burns could reduce air quality in the short term, due to poor smoke dispersal (Sandberg and Dost 2000), but prescriptions would be designed to minimize these impacts.

Water

No Action - Water quality concerns could occur in specific areas. Vegetative communities that naturally recover at a slower rate and also contain steep gradients or slopes have greater potential for erosion. If emergency stablization and restoration treatments were delayed and revegetation implementation deferred as a result, burned areas in those vegetative communities could be at risk for long-term deterioration of water quality due to soil erosion and downstream sedimentation.

Proposed Action - The effects to water resources are related to treatments and their effects on soils as discussed in the previous section. Seedbed preparation and mechanical seeding generally would result in increased infiltration.

Short-term indirect effects of increased sedimentation would occur if soil particles from mechanized treatment areas were transported downslope to a stream. Long-term indirect effects from upland treatments would include improved hydrologic function on the watershed as the site becomes re-vegetated with desirable vegetative species.

Long-term indirect effects from upland broadcast treatments are expected to be similar to mechanical treatments if the re-vegetation success is similar.

Proper selection, timing, and application of herbicides for prescribed weed treatments would minimize the risk of these substances inadvertently entering aquatic ecosystems. Direct effects to water quality could occur if chemicals were accidentally spilled into the water. Over time, noxious/invasive weed control would result in healthier watersheds by reducing competition with desirable species that provide greater soil stability.

Vegetation

No Action - Weeds, invasive and non-native plants would continue to persist and expand and habitat quality would continue to decline over time as the need for restoration projects is slowed and acres in need of treatments continues to build over time as a result of additional disturbances. If riparian plantings were not done, streambank stability would not be improved, watershed health would remain the same and solar radiation would not be altered. Wildlife habitat would not be improved, and the recreational values would not be enhanced. Habitat for sensitive species would not be improved and would continue to decline as noxious and invasive species increase.

Proposed Action - Mechanical seedbed preparation, seeding, weeds control, fencing, and off-highway vehicle traffic could create some short-term compaction and disturbance impacts to the soil and remaining vegetation. The no-till drill or rangeland drill with depth bands, and hand seeding would be less damaging to existing vegetation than other mechanical methods used to prepare soil for seeding. Standard rangeland drilling, harrowing, disking and chisel plowing would have the highest short-term impacts, because these methods would expose the soil surface to wind erosion.

The short-term effects of mechanical seedbed preparation and planting (soil compaction and movement) would be minimized by the project design features. Long-term benefits such as improved establishment of perennial vegetation and enhanced site stability would outweigh these short-term trade-offs. Other beneficial effects expected include: (1) improving and restoring the biodiversity of native vegetation, (2) restoring quality habitat for wildlife, and 3) contributing toward the return of a more natural fire cycle.

Aerial seeding would have no short-term impact to vegetation. The long-term effects would be improved establishment of perennial vegetation and enhanced site stability. The soil-to-seed contact would not be as reliable with aerial seeding, as with drilling the seed. Therefore, vegetative establishment would not be as reliable and could be "hit or miss," depending on such factors as weather conditions, but aerial seeding may nonetheless be appropriate in some instances.

Protective fences and/or deferred livestock grazing would protect recovering sites for at least 5 to 10 years until the vegetation is established adequately. Some vegetation would be damaged or destroyed during fence construction or reconstruction, primarily from off-highway vehicle traffic and brush clearing, but these impacts would be minimal and short term.

Herbicide application implemented with the design features would cause the mortality of noxious and undesirable vegetative species and promote establishment and recovery of native plants. A secondary impact would be reduction of a seed source for the noxious and undesirable plants.

Some non-target plants could be destroyed or damaged as a result of herbicide exposure. For specific effects about various chemicals approved for use, see the Environmental Impact Statement for Vegetation Treatment on BLM Land in Thirteen Western States (USDI-BLM 1991).

Special Status Plants - Conducting inventory for special status plant species prior to implementing all ground-disturbing activities, implementing weed control, and developing mitigation measures for any special status species on those sites would minimize the potential for impacting any special status plant species.

Wildlife

General Terrestrial Wildlife

Mule Deer, White-Tailed Deer, Black-Tailed Deer, Elk, and Bighorn Sheep

No Action – Under this alternative, fuels would continue to accumulate. Decadent shrubs and increased juniper densities would reduce forage opportunities for big game in some areas, since fuels would continue to accumulate at a faster rate than restoration projects. Over the long term, increased fuel densities would increase wild land fire acreage by supporting larger, more intense and more severe wild land fire.

The No Action Alternative could result in a greater risk of non-desirable plant species establishing within disturbed and especially large burned areas if rehabilitation treatments were

not implemented post-fire or if treatments were delayed. Once established, these weed species could prove difficult and costly to remove. The quality and quantity of forage available to wildlife could be diminished, excluding many vegetative species from re-establishing within the disturbed areas. Big game animals would avoid areas dominated by cheatgrass and other weeds and a reduction of hiding cover. Areas critical to wintering big game herds could have diminished ability to sustain herds.

Proposed Action **-** Restoration treatments would not be expected to adversely affect habitat for big game, such as mule deer, over the long term. Any direct adverse impacts (such as loss of forage) would likely be localized, temporary, and minor. Wildlife habitat would improve incrementally over a long period of time, as weed-infested areas recover to more natural conditions. Big game species that rely on shrub-grassland-forb communities would have improved forage in the long term.

Ground-based herbicide applications would not likely pose direct contact risk to these highly mobile big game species. However, aerial application may pose risk of direct contact with big game animals, migratory birds, and non-game animals; however, exposure would be short duration. Herbicide residues would cause minimal effects from ingestion. However, under unusual circumstances, where animals would be directly sprayed or feed exclusively on vegetation containing herbicide residues, individual animals could receive toxic herbicide doses. Considering the small acreage to be treated with herbicides and the targeted treatment method on individual plants, the potential for impacting wildlife would be minimal.

The design features for fences would ensure they were visible to big game animals and would only minimally inhibit wildlife movements.

Migratory Birds

No Action **–** This alternative would allow fuels to continue to accumulate. Decadent shrubs would be dominant in some areas, there would be increased juniper densities in other areas and a continued lack of plant diversity in areas under the Conservation Reserve Program. Increased juniper densities would increase wild land fire hazard by supporting larger, more intense and more severe wild land fire.

Proposed Action **-** Restoring a variety of native plant species, coupled with noxious and invasive weed treatments, would maintain or improve migratory bird nesting habitat in the long term. Implementing ground-disturbing mechanical treatments (such as rangeland drill, no-till drill, press wheel, land imprinter, cultipacker, harrow, and chisel plow) during the spring and summer, as well as prescribed fire, could lower the reproductive success of ground-nesting birds in the short term since nest or brood avoidance is not always completely successful.

Short-term effects of prescribed fire would include reduction of shrub and tree canopy, as well as the temporary reduction in herbaceous cover due to the removal of biomass. Wild land fire could result in greater mortality and more continuous removal of canopy due to higher heat intensities than with prescribed fire. Herbaceous cover, particularly annual species, should increase within two growing seasons after a fire. Chemical treatments could result in the mortality of non-target vegetative species.

Over the long term, most species of migratory birds would benefit from increased vegetative cover of perennial grasses and shrubs for nesting and foraging.

Sagebrush-Obligate Wildlife

No Action – Under this alternative, restoration of sagebrush habitats would continue at a slow pace as funding becomes available. Leaving disturbed areas to recover without treatments could provide areas of low quality habitats for the short term and potentially the long term. These areas would be used to some degree by sagebrush-obligate wildlife species, but they would likely not provide the full range of habitat components needed to sustain healthy populations of these species (Vander Haegen et al.2001 and 2005).

The expected fuel accumulations associated with the No Action Alternative would pose risk of a large, high-intensity fire. A fire of intense magnitude could delay development of climax sagebrush species that provide important cover to wildlife species such as mule deer, greater sage-grouse, sage sparrow, and the pygmy rabbit. Some of these species would be unable to escape; others would relocate to other areas that provide needed sagebrush habitat.

Proposed Action - Potential adverse impacts of restoration treatments on sagebrush-obligate species are expected to be relatively minor and short-lived and would be offset by long-term benefits after restoration is completed (McAdoo et al. 2004).

Areas with a human-caused loss of native wildlife habitat qualities would be restored under this alternative and provide a greater diversity of wildlife. Areas such as old agricultural fields and Conservation Reserve Program areas dominated with introduced plants such as crested wheatgrass would not return to native shrub-steppe habitat for many decades if ever without restoration. These areas would not provide quality habitat for many species of shrub-steppe obligate wildlife, but would continue to provide habitat for a few species of wildlife were able to adapt to those disturbed habitat conditions (Vander Haegen 2004).

Short-term impacts to sagebrush obligate species habitats depend on which cover types are considered, as well as the kinds of treatments applied. Treatments of cheatgrass-dominated patches result in different effects than treatments in perennial grass, shrub steppe, or areas of juniper encroachment. For purposes of analyzing impacts on the sagebrush obligates, annual grass (such as cheatgrass) is generally considered to be low-quality habitat. Treating annual grass results in few negative impacts on the sagebrush-obligate species, because this habitat provides little value to these species, and this trade-off improves the quality and quantity of habitat in the long-term. Perennial grass habitats are of slightly higher quality to sagebrush-obligate species. Treatments in perennial grass fields, such as crested wheat plantings, would have a short-term loss of habitat, but rapidly recover and result in relatively light impact over the long term, and eventually provide benefits to the sagebrush-obligate species.

Treatments in native shrub-steppe habitats would result in decreased habitat quality over the short term, due to reduced canopy cover and structural diversity. This would be a negative impact to sagebrush obligate species that would be present. However, these treatments would occur in small areas within larger areas of sagebrush cover, and the impact to local populations as a whole would likely be minimal.

Vegetation treatments are an effective tool to enhance some greater sage-grouse brooding habitat, particularly in areas where sagebrush is nearby and abundant, a "good" population of native forbs is present, and non-native plant species are limited.

Other Terrestrial Wildlife

No Action – Potential impacts to habitat of non-game mammals, native game birds, amphibians, and reptiles are expected to be relatively minor and short-lived and would be offset by long-term benefits of improved habitat. Vegetation restoration at current levels would gradually improve the ratio of quality sagebrush habitats to disturbed sagebrush habitats, but wildlife populations would likely show little improvement for the long term, since habitat deterioration would continue as restoration projects attempt to keep pace.

Proposed Action – Potential impacts to habitat of non-game mammals, native game birds, amphibians, and reptiles are expected to be relatively minor and short term and would be offset in the long term by improved habitat. In general, restoration treatments would likely provide a mosaic of perennial grass stands and patches of big sagebrush. According to McAdoo et al. (2004), managing for a diversity of wildlife species in sagebrush-dominated areas of the West is best accomplished by a mosaic of habitats with multiple-aged stands of sagebrush and varying degrees of herbaceous and shrub cover to provide the vertical and horizontal vegetation composition and structure required by diverse wildlife species. The greater pace of restoration under this alternative would more likely offset the effects of habitat deterioration over time than would the No Action Alternative.

Riparian Habitat

Species analyzed as part of the riparian habitats include bald eagle, western yellow-billed cuckoo, willow flycatcher, northern leopard frog, and spotted frog.

No Action – Burned area stabilization and ecosystem restoration activities would have little to no direct impact on species inhabiting riparian habitat; however, treatments in sagebrush steppe and surrounding riparian habitat would potentially have indirect impacts on these species. Sedimentation of streams and the subsequent loss of riparian habitat quality can occur when upland areas around riparian zones are disturbed by treatments. These potential impacts would be less likely to occur under the No Action Alternative due to a fewer number of acres treated per year than under the Proposed Action Alternative.

Proposed Action – Although this alternative could have slightly more impacts to riparian habitats than the No Action Alternative, it is still likely that only very minor impacts would occur given the protection provided by the design features proposed.

Project design features of vegetation restoration treatments would avoid impacts to the crucial habitats of the bald eagle and western yellow-billed cuckoo.

Although care would be taken with treatments in and around riparian areas, Northern leopard frogs and spotted frogs could still be impacted by treatments in upland areas bordering riparian areas. Vegetation treatments could temporarily remove vegetation in upland areas near riparian

habitat, increasing the potential for sedimentation to streams and wetland areas that support habitat for these species. Chemical treatments, in particular, would have potential to impact leopard frogs and spotted frogs. It is expected that any inadvertent impacts would be short term in nature and very limited in extent.

Special Status Terrestrial Wildlife

No Action – Treatments would cause no detrimental impacts to any of these species over the long term.

Under this alternative, wildland fires could be more common than under the Proposed Alternative, because there would be more acres of non-native annual grass. These fires would remove essentially all standing woody material that provides a major or necessary component for wildlife habitat diversity and populations, especially for sagebrush-obligate species. The habitat recovery would typically result in a reduced diversity of wildlife species due to many years of grass and forb-dominated habitats with a slow recovery of the shrub component in high intensity burn areas. The grass and forb component would have high potential for invasive annual weeds with a gradual increase of native bunchgrasses over time.

Proposed Action – Completing inventories and biological assessments for special status wildlife (Table 1) and their habitats, including Washington ground squirrel and sage grouse, prior to implementation of all ground-disturbing and/or noise generating activities and herbicide treatments would help identify project design features to protect habitat of these species.

Bald Eagle – Following guidance for bald eagles would provide adequate protection for this species. Another consideration for expecting few impacts to this species is that there are few bald eagle nests in the vegetative restoration area.

Sage-grouse - The effects of management treatments on sage-grouse were reviewed by Connelly et al. (2004). Sage-grouse could be impacted by ground-disturbing restoration treatments such as harrowing, disking, cultipacker, imprinter, vehicle traffic and fencing. These impacts would be mostly in the form of temporary displacement of animals or disruption of movements between habitats. The long-term benefits of restoring native habitat for wildlife would outweigh the short-term effects of displacement.

Weed treatments, restoration of native vegetation, and deferred livestock grazing would benefit sage-grouse habitat in the long term, by a more rapid establishment of a suitable habitat along with an overall increase in quality and quantity of food and cover.

Washington Ground Squirrel - Reconstruction or construction of fence lines could create open spaces and provide raptor perches that could increase ground squirrel predation.

The protective measures, such as buffer and fence design, would ensure that any impacts to these squirrels from restoration activities would be short term.

Fisheries

No Action - Soil erosion from treatment disturbance could cause runoff into riparian areas and fish-bearing streams in the short term, with a resulting negative impact to aquatic fisheries species. This impact would be very minor, given the precautions presently in place to reduce these impacts.

Proposed Action – Similar to the No Action Alternative, treatment disturbance could cause water runoff into riparian areas and fish-bearing streams in the short term. The risk would be slightly greater with this alternative, given the larger number of acres treated. The impacts would still be minor, considering the protections in place (USFWS 2002).

Herbicide application would have little or no impact to aquatic species from the proposed herbicide treatments. None of the proposed herbicides (applied at the prescribed method and rate) showed tendency for bioaccumulation and long-term persistence in the food chain. The aquatic impacts from the proposed herbicide use in order of decreasing risk would be 2, 4-D Amine, Picloram, Clopyralid and Metsulfuron methyl. The greatest threat to aquatic resources would be accidental, from herbicide spills in or near water or erratic herbicide drift. However, adhering to design features and mitigation measures would greatly reduce the probability of these impacts.

Wetland/Riparian Zones

No Action – Overall impacts to riparian areas from treatment methods are small at present, and would continue to be minimal due to the specific design features in place.

Proposed Action – Although slightly greater under this alternative, overall impacts to riparian areas from treatment methods would be minimal due to specific design features proposed. Riparian areas would realize long-term benefits from upland treatments designed to stabilize soil, minimize rill and gully erosion, and protect streambanks (USDI-BLM 1993).

There may be some short-term soil impacts associated with riparian techniques, including seeding and planting of woody or herbaceous species. These treatments would pose a localized, increased risk of erosion until the site becomes re-vegetated.

Constructing fences around seeded and restoration areas would protect young seedlings and growth from damage by livestock and wildlife browse. There would be some short-term vegetative impacts associated with fence construction or reconstruction (primarily brush clearing) and planting, but riparian areas would quickly re-vegetate due to available soil moisture.

Recreation

No Action - Taking no action or taking a slower response to control the spread of noxious weeds would result in weeds, invasive and non-native plants continuing to persist and expand. Loss or degradation of habitat due to weeds means less wildflower viewing, wildlife viewing and hunting. In the case of some types of weeds, non-motorized cross-country travel may become very difficult as well. People may choose to no longer visit or recreate in certain areas where the weeds have taken over. If use patterns continue in these areas, however, weeds would have a

much greater chance of spreading if no control is done. In addition, erosion could increase in recreational use areas where weeds have replaced native plants.

Proposed Action **-** Under the Proposed Action Alternative, impacts from restoration treatments would be mainly temporary in nature. The Proposed Action could result in additional recreation use in the long term and increased wild land values, such as wildlife use and increased plant diversity. Due to the small size of the parcels, the increase in recreational values may not be significant.

In many areas, weed treatment and restoration locations would be visible along roadways or near dispersed or developed recreation sites. Recreation access could be restricted if restoration projects require a temporary closure to the public to prevent resource damage, accelerated erosion, and to allow time for establishment. After successful chemical and biological weed treatments, targeted noxious weeds would be dead or dying. In some areas, it could take several years for native vegetation to reoccupy a site, possibly requiring additional vegetative treatments. During and immediately after an area is treated with chemicals, some people might choose to avoid these areas.

The BLM vehicles and all-terrain vehicles used to implement treatments described in the Proposed Action could create new roads and trails if travel occurs cross-country over unroaded areas. Traveling unroaded areas would create tracks that could develop into trails or roads with future use. This is especially true in the Saddle Mountains or Selah Butte areas where off-highway vehicle use is already occurring.

Construction of fence lines would impede recreational use of areas.

Native plant re-establishment would improve the scenic quality, increase wildlife forage and in turn result in additional wildlife sightings for the wildlife viewing public, and enhance surroundings for dispersed campers. The Proposed Action could result in additional recreation use and increased wild land values such as wildlife use and increased plant diversity. Treatment of degraded areas, agricultural fields, and Conservation Reserve Proram fields would result in enhanced visual quality and also decrease the risk of fire associated with recreational use.

Short-term impacts to recreation could occur if restoration project sites require a temporary closure to the public to prevent resource damage, accelerated erosion, and allow time for vegetative establishment.

Scenic properties of the landscape would be changed, in the long term, as a result of restoration treatments. This change could alter recreational use patterns. Treatment of degraded areas, agricultural fields, and Conservation Reserve Program fields would enhance the treated areas' visual quality and decrease the risk of fire associated with recreational use. In the long-term, restoration treatments would improve the overall recreational experience.

The few expected impacts on recreation would be temporary and short term. Dead and dying plants, or temporary dye used in weed treatment, could be visible for a short time along roadways or near areas where dispersed recreation occurs until the areas revegetate with native species. In some areas, native vegetation could take several years to reoccupy a site, especially on those areas requiring additional follow-up treatments of noxious weeds. Plants treated under either biological

control or herbicides would die and individually could be unattractive. However, since no broad herbicide application would be done, the scenic values of the treatment sites are not expected to be impacted. A short-term impact is that people may choose to avoid entering areas where herbicides are used.

Cultural and Paleontological Resources

Project design features of inventorying project sites prior to implementing noxious weed treatment would protect cultural and paleontological resources.

The proposed treatments are not expected to adversely affect traditional plant gathering locations since lands infested with noxious weeds, invasive species, and introduced species rarely support healthy native plant communities. Removal of these species should allow native plants to become re-established, thereby improving the potential for traditional plant gathering in the project areas.

No Action **-** There would be no effect to cultural or paleontological resources within the proposed sagebrush restoration area under the No Action Alternative. Cultural resources susceptible to processes of natural deterioration (such as wooden structures) would continue to decay over time.

Proposed Action **-** Use of ground-disturbing equipment such as harrows, rangeland drills, disks, and chisel plows would have potential to damage or destroy cultural resources.

The proposed combination of inventory and appropriate avoidance measures in consultation with the SHPO and Tribal Historic Preservation Officers would identify and protect (through avoidance) irretrievable paleontological, cultural, and historic resources while conducting ground disturbing treatments such as seedbed preparation, seeding, and fencing. Utilizing cultural resources specialist direction and supervision during restoration treatments would reduce the potential for impacts to significant cultural resources.

In the long term, soil stabilization from restoration efforts could benefit some cultural sites by minimizing soil movement. Reducing noxious weeds and non-native vegetation could also help restore some plant resources and habitats that are important to traditional subsistence activities.

Grazing Management

No Action **–** For herbicide impacts, a discussion of environmental consequences can be found in the Final Environmental Impact Statement for Vegetation Treatment on BLM Lands in Thirteen States (1991). Specific sections are identified below:

- Environmental and Toxicological Effects: Appendix E (Risk Assessment, Section E1-E8)
- Effects on Fish and Wildlife: pages 3-50 and 3-53
- Effects on Soils: pages 3-36 and 3-40
- Effects on Water/Aquatic Resources: pages 3-42 and 3-43
- Effects of Special Status Plants and Animal species: page 3-64

Impacts of herbicides, as presently used, are within the parameters of those in the above referenced FEIS.

Proposed Action – Under this alternative, there could be some additional short-term economic loss to livestock permittees as a result of more acres of restoration treatments, grazing closures, and/or other restrictions in areas under grazing permits. These economic losses would be associated with reduced pasture use due to pasture closures and/or restrictions in some areas for 2 years or until site objectives are met. This impact is expected to be minimal as restoration project areas are expected to be less than 600 acres in size, except for larger areas burned by wild fire.

The toxicity of the chemicals proposed for treatment is low. No evidence is available of direct damage to animals resulting from the use of the proposed herbicides (Pacific Northwest Weed Control Handbook 1999).

Restoration treatments would: (1) prevent noxious weed invasion into rangelands, (2) replace poor quality rangelands (such as those dominated by cheatgrass or big sagebrush) with high quality perennial community types, (3) improve the ecological health of the rangeland, and (4) contribute toward reducing large-scale, high intensity fires, which would otherwise burn large areas of rangeland, reducing short-term forage and possibly introducing invasive species. In the long term, these impacts resulting from vegetative restoration treatments would improve rangeland health and stability.

Critical Values Considered in Analysis

Environmental Justice: Native American values were considered in analysis of the alternatives. No disproportionately high and adverse human health or environmental effects on minority or low-income populations are expected to result from implementation of any of the alternatives addressed in this environmental assessment.

Other Critical Elements

- Air quality
- Cultural resources
- Native American Religious Concerns
- Floodplain
- Prime/unique farmlands
- Wastes (Hazardous or Solid)
- Special area designations (including Areas of Critical Environmental Concern)
- Threatened and Endangered species
- Water quality (surface and ground)
- Wetland/Riparian zones
- Wild and scenic rivers
- Wilderness
- Invasive non-native species
- Adverse impacts to energy

Air quality, cultural resources, threatened and endangered species, and wetland/riparian zones are addressed in this programmatic document. All of the critical elements will be considered in additional review or analysis done at the site-specific project level.

Cumulative Impacts

As discussed in the Background section of this document, agricultural use, homesite development, and wildland fires have reduced the amount of sagebrush-steppe habitat over much of eastern and central Washington state. It is because of the cumulative loss of this habitat, continued risks to further habitat fragmentation, and agency direction that vegetation restoration is being planned. Some private non-profit agencies have been actively engaged in supporting vegetation restoration activities, through land exchange efforts in Washington state, preliminary planning for restoration projects, and on-the-ground work. This programmatic management direction is intended to promote more coordinated vegetative restoration across the landscape.

Over the years, various vegetative restoration projects have been implemented, some in association with fire rehabilitation and some as small experimental plots. To date, approximately 350 acres are in the planning stages for vegetative restoration. Staff are proposing to maintain a database, to establish a baseline and track acres treated. This database should help assess cumulative impacts as the vegetative restoration projects are planned and implemented across the 13-county area.

Forseeable future project areas are likely to be within BLM lands shown as cropland or CRP on Map 2. It is apparent from close examination of the map that potential project areas are limited to small and scattered areas, often on the edges of larger pieces of shrub steppe. In addition, some small areas of shrub steppe in very poor condition may be suitable for restoration projects, and additional lands that may be acquired through land trades may require restoration as well. Over the next 10 year period, an estimate of restoration project acres may approximate 100 acres under the no action alternative compared to 200 to 300 acres under the proposed alternative.

List of Preparers

The following BLM specialists provided input to this programmatic management direction and environmental assessment:

- Pamela Camp, Botanist, Wenatchee Field Office
- Kathy Helm, Planner and Environmental Coordinator, Spokane District Office
- Joe Kelly, Fisheries Biologist, Wenatchee Field Office
- Dana Peterson, Range Management Specialist, Wenatchee Field Office
- Diane Priebe, Recreation Specialist, Wenatchee Field Office
- James R. Rees, Wildlife Biologist, Wenatchee Field Office
- Robert Troiano, Weed Coordinator, Spokane Distinct Office
- Ann Boyd, Archeologist, Spokane District

Coordination and Consultation With Other Individuals and Agencies

The project design features in this programmatic management direction provide for tribal consultation to be done at the site-specific level, as projects are identified.

VII. Literature Cited

Allen, E.B. 2004. Restoration of *Artemisia* shrublands invaded by non-native annual *Bromus*: A comparison between southern California and the Intermountain Region. USDA Forest Service Proceedings RMRS-P31.

Anderson, J.E. and R.S Inouye. 2001. Landscape-scale changes in plant species abundance and plant species biodiversity of a sagebrush steppe over 45 years. *Ecological Monographs* 71(4):531-556.

Connelly, J.W., S.T. Knick, M.A. Schroeder, S.J. Stiver. 2004. Conservation Assessment of Greater Sage-grouse and Sagebrush Habitats. Western Association of Fish and Wildlife Agencies. Unpublished Report. Cheyenne, WY.

Hilty, J.H., D.J. Eldridge, R. Rosentreter, M.C. Wicklow-Howard, and M. Pellant. 2004. Recovery of biological soil crusts following wildfire in Idaho. *J. Range Manage*. 57: 89-96.

Johnson, R.R., L.T. Haight and J.M. Simpson. 1987. Endangered habitats versus endangered species: A management challenge. *Western Birds.* 18:89-96. 8-3

McAdoo, J.K., S.R. Swanson, B.W. Schultz, and P.F. Brussard. 2004. Vegetation management for sagebrush-Associated Wildlife Species. USDA Forest Service Proceedings RMRS-P-31; pp.189-193.

McDonald, M. W., and K. P. Reese. 1998. Landscape changes within the historical distribution of Columbian sharp-tailed grouse in eastern Washington: is there hope? Northwest Sci. 72:34-41.

Miller, R.F. and J.A. Rose. 1999. Fire History and western juniper encroachment in sagebrush steppe. *J. Range Manage.* 52:550-559.

Monsen, Stephen B.; Stevens, Richard; Shaw, Nancy L., comps. 2004. Restoring Western Ranges and Wildlands. Gen. Tech. Rep. RMRS-GTR-136-vol-1. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. Pages 1-294 plus index.

Monsen, Stephen B.; Stevens, Richard; Shaw, Nancy L., comps. 2004. Restoring western ranges and wildlands. Gen. Tech. Rep. RMRS-GTR-136-vol-2. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. pp. 295-698 plus index.

Monsen, Stephen B.; Stevens, Richard; Shaw, Nancy L., comps. 2004. Restoring western ranges and wildlands. Gen. Tech. Rep. RMRS-GTR-136-vol-3. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. pp. 699-884 plus appendices and index.

Musser, J., and T. McCall. 2000. Pygmy rabbit management. Washington Department of Fish and Wildlife. Olympia, WA. 12 p.

Richardson, S., M. Whalen, D. Demers, and R. Milner. 2000. Ferruginous hawk (*Buteoregalis*). *In* Management recommendations for Washington's priority species (web site). Volume IV: birds. Washington Department of Fish and Wildlife. Olympia, WA.

Sandberg, D.V. and E.N. Dost. 1990. Effects of prescribed fire on air quality and human health. pp.191-218 in J.D. Walstad, S.R. Radosevich, and D.V. Sandberg (eds.). Natural and prescribed fires in Pacific Northwest forests. Oregon State University Press, Corvallis, OR.

Schroeder, M. A., D. W. Hays, M. A. Murphy, and D. J. Pierce. 2000a. Changes in the distribution and abundance of Columbian sharp-tailed grouse in Washington. Northwestern Naturalist 81:95-103.

Schroeder, M. A., D. W. Hays, M. F. Livingston, L. E. Stream, J. E. Jacobson, and D. J. Pierce. 2000b. Changes in the distribution and abundance of sage grouse in Washington. Northwestern Naturalist 81:104-112

Stebbens, R.C. 1985. A field guide to western reptiles and amphibians. Houghton Mifflin Co., Boston, MA.

Stinson, D.W., D.W. Hays, and M. A. Schroeder. 2004. Washington State Recovery Plan for the Greater Sage-Grouse. Washington Department of Fish and Wildlife, Olympia, WA. 109 p.

Thomas, J.W. and D.E. Toweill. Elk of North America – Ecology and Management. Wildlife Management Institute in Cooperation with USDA. Forest Service. Stackpole Books. 698 p.

USDA-USDI ICBEMP. 1996. An Integrated Scientific Assessment for Ecosystem Management in the Interior Columbia Basin and Portions of the Klamath and Great Basins. 1996. Thomas M. Quigley, Richard W. Haynes, and Russell T. Graham, Technical Editors. Gen. Tech. Rep. PNW-GTR-382.

USDA-USFS Rocky Mountain Research Station, Fire Sciences Laboratory. 2002a.(2002a, September). Fire Effects Information System, Species: *Artemisia tridentata* ssp.*wyomingensis*.

USDA-USFS Rocky Mountain Research Station, Fire Sciences Laboratory. 2002b. (2002b, September). Fire Effects Information System, Species: *Juniperus scopulorum.*

USDA-USFS Rocky Mountain Research Station, Fire Sciences Laboratory. 2002c. (2002, September). Fire Effects Information System, Species: *Artemisia tridentata* ssp. *vaseyana*.

USDA-USFS Rocky Mountain Research Station, Fire Sciences Laboratory. 2002d. (2002, September). Fire Effects Information System, Species: *Artemisia tridentata* ssp.*tridentata*.

USDA-USFS Rocky Mountain Research Station, Fire Sciences Laboratory. 2002e. (2002, September). Fire Effects Information System, *Species: Populus tremuloides.* [online].

USDI-BLM. 1993. Revised 1995, 1998. Riparian area management, Process for assessing proper functioning condition. Technical Report 1737-9. BLM/SC/ST-93/003+1737+REV95. Bureau of Land Management, Service Center, Denver, CO.

USDI and USDA. 2001. A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment. 10-Year Comprehensive Strategy. August issue.

USDI-BLM. 1989. Fencing Manual Handbook H-1741-1. Bureau of Land Management, Washington, DC. 45 p.

USDI-BLM. 1998. Prescribed Fire Management Handbook. U.S. Dept. of Interior, Bureau of Land Mgmt., Office of Fire and Aviation, Wash. DC. 36 p.

USDI-BLM. 1991. Final Environmental Impact Statement, Vegetation Treatment on BLM Lands in Thirteen Western States. Bureau of Land Management, Casper, WY.

USDI-BLM. 2002. Programmatic Biological Assessment of Spokane District Land Use Plan, Area 2, Spokane. U.S. Bureau of Land Management, Spokane, WA. 26 p.

USDI-BLM. 2004. National Sage-Grouse Habitat Conservation Strategy. Washington DC. <http://www.blm.gov/nhp/spotlight/sage_grouse/>. November issue. 25 p.

USFWS. 2002. Bull trout (*Salvelinus confluentus*) Draft Recovery Plan. Portland, OR. 137 p.

Vander Haegen, W.M., M.A. Schroeder, S. S. Germaine, S. D. West, and R.R. Gitzen. 2005. Wildlife on Conservation Reserve Program lands and native shrubsteppe in Washington: Progress Report for 2004. Washington Department of Fish and Wildlife, Olympia, WA. 51 p.

Wallmo, ed. 1981. Mule and black-tailed deer of North America. University of Nebraska Press, Lincoln, NE.

West, N.E. 1990. Structure and function of microphytic soil crusts in wildlife ecosystems of arid and semi-arid regions. *Adv. Ecol. Res.* 20:179-223.

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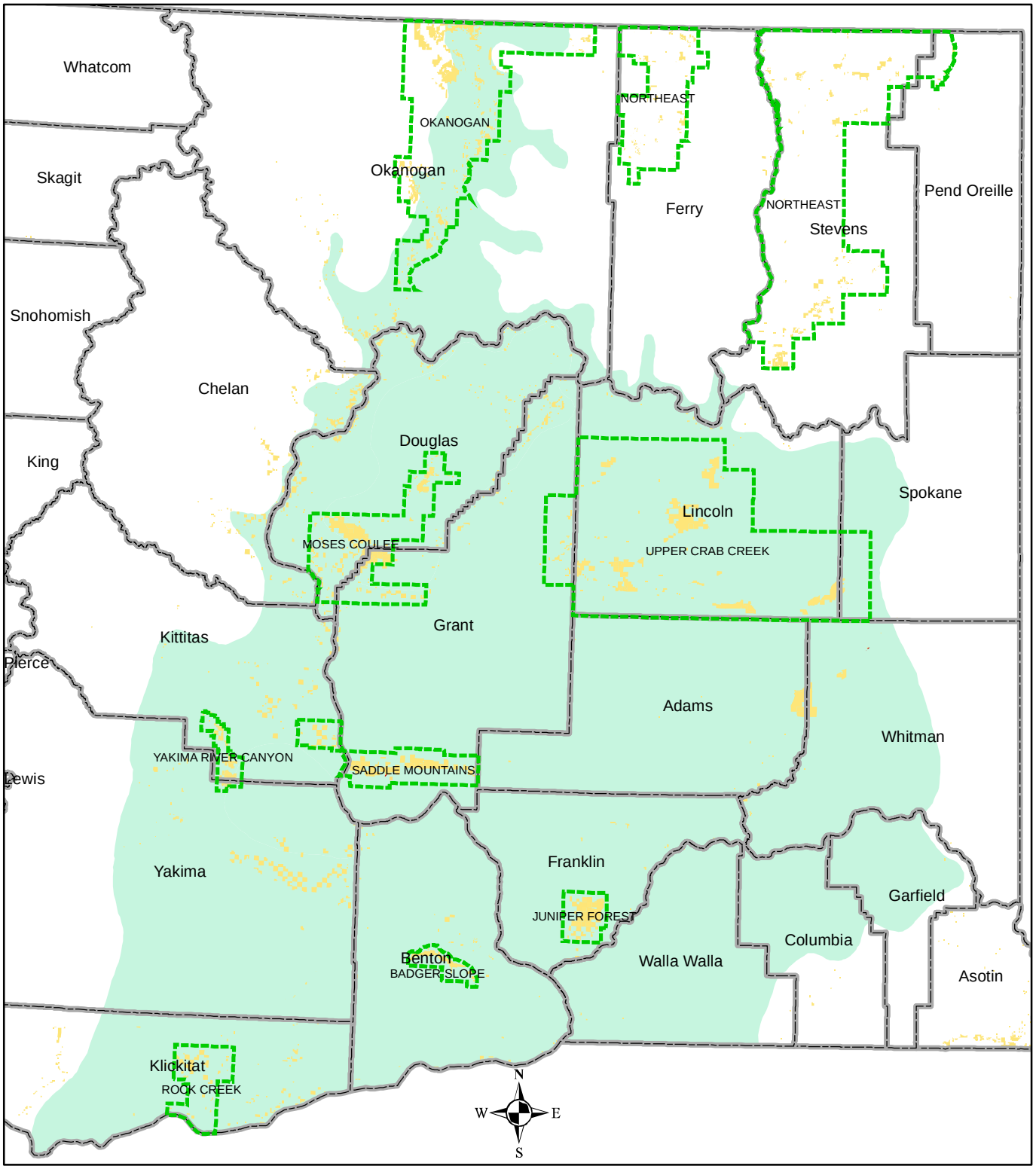

Legend

- RMP Management Areas
- BLM Lands
- Sage Grouse Historical Habitat

0 10 20 30 40 50

Miles