

# Decision Record

**NEPA Register Number:** DOI-BLM-OR-P000-2008-0157-EA

**Title of Action:** High Desert Shrub Steppe Restoration Project

**BLM Office:** Prineville District Bureau of Land Management, 3050 NE Third Street, Prineville Oregon, 97754

## 1. Background

An Environmental Assessment (EA) and Finding of No Significant Impacts (FONSI) for the proposed High Desert Shrub Steppe Restoration Project (DOI-BLM-OR-P000-2008-00157-EA) were prepared by the Prineville District of the Bureau of Land Management (BLM). The actions included in this Decision Record were analyzed in the EA, and will occur on approximately 13,600 acres per year on public land around Millican, Brothers, Hampton and Paulina, within the project area shown on the maps in the EA (available at <http://www.blm.gov/or/districts/prineville/plans/index.php>). Actions are designed to maintain or improve sage-grouse habitat suitability through vegetation management. A combination of the following vegetation management actions will be used: cut juniper, prescribe burn rangeland, mow or crush shrubs, or transplant or seed grasses, forbs (herbs) or shrubs.

## 2. Public Involvement

In August 2008 the Prineville BLM solicited scoping comments for the High Desert Shrub Steppe Restoration Project from 100 individuals, adjacent landowners, organizations, tribal governments, and state and local government agencies. Comments were received from The Nature Conservancy, the Oregon Department of Fish & Wildlife, Oregon Wild, the Oregon Natural Desert Association, and a number of individuals including people who live in the project area. Many of those comments are summarized and addressed in the EA in the Issues section (pages 7 and 23-29) and in Alternatives considered but eliminated (pages 11 and 12). In many cases the scoping comments led to the incorporation of project design features into the action alternatives.

The general public was notified via the Prineville District Project Planning Updates which were posted on the Prineville web page from July 2008 through present.

The BLM posted the completed EA on the Prineville web page, and mailed letters to over 100 addresses announcing the availability of the EA. During the public review period for the EA ending on April 29, 2011, the BLM received a letter from one organization, Oregon Wild. On May 11, the BLM received a letter from the Confederated Tribes of the Warm Springs Reservation of Oregon, in which the Cultural Resource Manager stated that the tribe had no comments on the EA. No other comments were received after publication of the EA.

Based on the comments in Oregon Wild's letter, we made one minor change to the project design features to clarify intent: Clarify that no old growth trees will be cut, regardless of species, even if they

are near a nest tree where smaller trees may be cut to reduce chance of fire spread (page 31). For the purposes of this decision, old growth juniper are defined by physical characteristics (rounded tops or spreading canopies, dead branches covered with fruticose lichen, and bark with deep furrows), and old ponderosa pine are those greater than 18 inches in diameter at breast height.

Another minor edit to the EA was to clarify that no cutting, mowing or crushing would be permitted in areas designated VRM Class I, but that prescribed burning could occur in these areas if a number of project design features were applied to minimize short term effects on visual resources. No treatments at all will be permitted in the Horse Ridge Area of Critical Environmental Concern/Research Natural Area.

These changes do not alter the conclusions of the analysis; therefore the EA will not be recirculated for public review. The changes are incorporated into the project design features attached to this decision.

### **3. Proposed or Selected Alternative**

Based on the analysis documented in the Environmental Assessment (DOI-BLM-OR-P000-2008-0157-EA) and the Finding of No Significant Impact (FONSI), it is our decision to implement Alternative 2, Mechanical Treatment Emphasis, because it best meets the purpose and need of the project. This alternative is described on pages 8-10 of the EA, and below:

- Cut, mow, or crush young juniper and/or shrubs on 10,200 acres annually, and allow removal of tree boles via personal use permits (generally firewood), commercial sales, or other methods.
- Prescribe burn 3,400 acres of standing live vegetation, and about half of the areas that have already been treated by cutting, mowing or crushing.
- Seed or root stock transplant 500 acres per year of native or non-native forbs, grass, or shrubs or a combination, generally on sites also treated mechanically or by prescribed burn.
- Require a number of additional project design features, incorporated here (see attachment, below) and described in detail in Chapter 2 Alternatives (pages 8-10) and Appendix B of the EA (pages 30-38).

The number of acres treated annually will vary depending on conditions at specific treatment sites, funding availability, opportunities for partnerships with private landowners, agencies or organizations, and other factors.

Treatments will be prioritized on those ecological sites most important to sage-grouse within currently occupied range, though treatment unit boundaries may include other ecological sites as well as potential but unoccupied habitat, or newly documented occupied habitat.

The treatment method (e.g., cut with chainsaw or feller-buncher, burn, seed) selected for a particular site will depend on the existing ecological condition of the site, desired plant densities for the site (as described in Table 1 of Chapter 1, attached below), and project design features described in Chapter 2 and Appendix B of the EA, and attached below. The selection process will begin by determining the ecological condition of a site using BLM's Ecological Site Inventory procedures. Using this procedure, the BLM measures current density of trees, shrubs and grasses and classifies the site as early, mid or late seral, or potential natural community. The soil sensitivity and presence of invasive plants, including noxious weeds, will also be factored in.

If current tree or shrub densities are higher than desired, the treatment will likely involve cutting, mowing, burning or otherwise reducing the abundance of the plant type that exceeds the desired amount. If grass, forb or shrub densities are lower than desired, the treatment may involve reducing trees, or seeding or transplanting grass, forbs, or shrubs.

BLM staff will monitor project layout and implementation to ensure the project design features are adhered to and are effective in minimizing undesirable effects. Specific monitoring is described in the attached project design features.

#### **4. Rationale for the Decision**

Chapter 2 of the EA described three alternatives: Alternative 1 the "No Action" alternative; Alternative 2 the "Proposed Action" alternative; and Alternative 3. The purpose of the project (pages 5-6 in EA) is to maintain existing shrub steppe habitats, maintain wildlife habitat and rangeland health, maintain or enhance the current range and distribution of sagebrush habitats in Oregon, manage sagebrush habitats in a range of structural stages to benefit sage-grouse, and focus on managing for 70 percent or more of sagebrush habitats in class 3, 4 and 5 (5 percent or more sagebrush canopy cover), with an added emphasis on classes 4 and 5 (15 percent or more sagebrush canopy cover).

The No Action alternative was not selected because it would not meet the purpose of the project. There are currently 308,300 acres of suitable sage-grouse habitat on public land in the planning area. After 25 years under Alternative 1, the amount of suitable sage-grouse habitat remaining in the project area would be 223,400 acres, as opposed to 563,800 acres under Alternatives 2 and 3.

Both Alternative 2 and 3 would meet the purpose and need of the project. They would provide the same amount of increase in suitable sage-grouse habitat. However, there were several reasons for our preference for Alternative 2. One of the issues identified for detailed analysis in the EA was greenhouse gas emissions. Emission of greenhouse gases would be lower in Alternative 2 (116,300 metric tons of carbon dioxide equivalent annually) than in Alternative 3 (162,500). Another issue analyzed in detail was the effect of the actions on visual resources. There would be more short term effects on visual resources in Alternative 2 than in Alternative 3, though the long term effect under both alternatives is similar (essentially no effect). Effects are summarized in Table 3 on page 20 of EA.

Project Design Features described in the EA (pages 8-10 and 30-38) and attached below will protect old growth trees, minimize soil compaction, limit erosion, protect slope stability, protect raptor nests, and provide protection for a number of other identified resource values.

While not a factor in our decision, the project could create up to 10 local jobs. We appreciate this positive effect, even though the effect on the local economy is technically "insignificant" (page 28 of the EA).

Based on the analysis of potential impacts contained in the EA, we have determined in the Finding of No Significant Impacts (FONSI) that the High Desert Shrub Steppe Restoration Project will not have a significant impact on the human environment within the meaning of Section 102(2) (c) of the National Environmental Policy Act of 1969 (FONSI pages 1-4). Thus, an EA is the appropriate level of analysis, and an Environmental Impact Statement will not be prepared.

## 5. Compliance

The actions are in conformance with the Upper Deschutes Resource Management Plan, Record of Decision 2005:

- Page 27, "Objective V-1: Maintain and restore healthy, diverse and productive native plant communities appropriate to local site conditions."
- Page 28, "Allocations: Vegetative restoration treatments may be accomplished by a variety of methods including but not limited to mechanical, prescribed fire, and grazing. Specific project prescriptions will be appropriate to site conditions, plant community types and resource objectives, and will be detailed in project level plans and NEPA analyses."
- Page 28, "Guidelines: Emphasize managing special status species habitats. Seed or plant grasses, forbs, shrubs and trees where appropriate to achieve a variety of objectives. Use native species for a majority of restoration treatments. Examples of when use of non-natives may be appropriate include: when advantageous for quick soil stabilization, when aggressive competition with invasive weeds is needed..."
- Page 30, "Objective V-1a: Maintain/restore large contiguous stands of healthy, productive and diverse native shrub steppe plant communities throughout their historic range...Rationale: on most historic shrub steppe sites, western juniper will be reduced to widely spaced old trees or small patches on ridge tops or other focused locations..."
- Page 31, "Guidelines: Composition, density and distribution of young western juniper will be reduced to historic levels...A primary criterion for prescribing treatment is when juniper occurs at a density and/or distribution determined to be outside its historic range of variability...Vegetation treatments to maintain or restore shrub steppe communities will be based on a landscape level restoration of broad vegetative types...Priorities will include restoration of sage grouse and other special status species habitat."

The actions are in conformance with the Brothers/La Pine RMP, Record of Decision 1989:

- Page 12, objective, "Provide optimum habitat diversity for game and non-game wildlife species."
- Pages 88-89, guidelines for juniper and shrub control projects on pages 88-89, including "Mosaic patterns will be incorporated into all control projects...Juniper control projects will be restricted to no more than 60 percent removal of juniper trees with leave areas..."
- Page 90, standard operating procedures, e.g., "All actions will be consistent with the BLM's Visual Resource Management criteria," "In crucial wildlife habitat...work will be scheduled during the appropriate season to avoid or minimize disturbances," "Surface disturbance at all project sites will be held to a minimum."

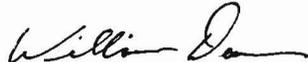
The implementation of this project will not have significant environmental effects beyond those already identified in the Environmental Impact Statements (EIS) for the two RMPs listed above. The RMPs and associated EISs are available at the Prineville BLM office or online at <http://www.blm.gov/or/districts/prineville/plans/prinevillermpp.php>

The selected action ensures compliance with Section 106 of the National Historic Preservation Act. This compliance includes consultation with the Oregon State Historic Preservation Office and interested tribes, and project design features that avoid disturbance to historic properties and paleontological resources.

The actions described in this Decision Record are in conformance with BLM's 1995 interim management policy and guidelines for lands under wilderness review, specifically pages 48 and 49 that describe limits on prescribed burning in Wilderness Study Areas. This policy is available online at <http://www.blm.gov/ca/st/en/prog/wilderness/wsa/regs.html>

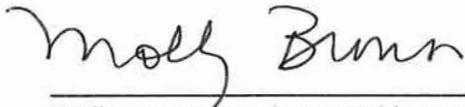
## 6. Appeal Opportunities

This decision constitutes my final decision and may be appealed to the Interior Board of Land Appeals, Office of the Secretary, in accordance with the regulations contained in 43 CFR, Part 4 and the enclosed Form 1842-1. If an appeal is taken, your notice of appeal must be filed in this office (3050 N.E. Third Street, Prineville, OR 97754) within 30 days from receipt of this decision. Notice of appeal must be sent certified mail. The appellant has the burden of showing that the decision appealed from is in error. Any request for stay of this decision in accordance with 43 CFR 4.21 must be filed with your appeal.

  
Acting For: \_\_\_\_\_

Homer "Chip" Faver, Central Oregon Field Manager

Date: May 12, 2011



Molly Brown, Deschutes Field Manager

Date: May 12, 2011

### Attachments:

- Ecological sites
- Project design features

## Attachment A. Ecological sites and current and desired canopy cover.

Ecological Site and precipitation (inches/year)	Public Acres	Current Canopy Cover						Desired Canopy Cover					
		Shrub			Grass	Forb	Tree	Shrub			Grass	Forb	Tree
		Bitter-brush	Sage-brush	Rabbit-brush			Jun-iper	Bitter-brush	Sage-brush	Rabbit-brush			Jun-iper
Arid plains 8-11	53,294	0	8-12	5	10-30	5-10	0	0	15	0-5	30	20	0
Claypan 12-16	19,513	0	10-12	1-5	20-40	5-7	1-5	0	15	0-3	30	20	1
Droughty loam 11-13	59,983	1	5-12	5-9	30-40	5	1-3	1	10	0-2	40	30	1
Dry lakebed 10-12	4,065	0	10-12	7-10	35-45	5	0	0	15	0-3	40	30	0
Dry ponded clay 6-10	2,074	0	8-10	1-5	25-50	1-3	0	0	10	0	85	5	0
Gravelly terrace 10-12	6,710	0	1-22	0-10	1-22	1-9	0	1	15	0-2	25	25	0
Lakebed	700	0	0	0	0-40	7-40	0	0	0	0	50	30	0
Loamy 12-16	1,847	0-3	1-24	0-13	20-56	1-63	0-14	0	15	0-3	35	25	0
North slopes 12-16	6,943	0-12	1-30	0-13	17-60	4-32	0-37	5	10	0-2	40	25	0
Ponded clay	4,660	0	3-12	1-5	5-15	1-3	0	0	15	0	40	30	0
Pumice 10-12	26,557	9	31	6	15	8	0-7	>15	10-15	0-2	25	25	0
Pumice 8-10	80,597	0	0-40	8	22	9	0-15	0	20-35	0-2	25	25	0
Pumice claypan 10-12	57,548	0	1-43	10	19	9	0-15	0	20-35	0-2	30	20	0
Pumice flat 10-12	53,271	0	0-40	7	15	13	0-10	0	20-35	0-2	25	25	0
Pumice north 10-12	10,705	17	24	7	33		5-23	>15	10-15	0-2	30	20	0
Pumice stony loam 10-12	7,731	7	17	5	43	9	1-27	>15	10-15	0-2	30	20	1-5

## **Attachment B. Project design features.**

### **Safety**

Fuel loading remaining after mechanical treatments within the wildland-urban interface (WUI) will be reduced to 3.3 tons/acre or less for woody debris that is one inch or less in diameter. The WUI is generally the area within ½ mile of groups of homes or other structures, though it may expand further in forested areas or where steep slopes could affect wildfire behavior. Some roads will be closed for a few hours during prescribed burning operations.

### **Wildlife**

Prior to any treatment, the BLM will complete clearances for locally important or special status species. Clearances involve: a) assessing the potential for the action to have an undesirable effect, b) ensuring the action includes design features specified in the Decision Record and other relevant decisions, and c) recommending changes to the action that would reduce effects below those analyzed in the EA.

Large ponderosa pine and Douglas fir, all old growth juniper, and any trees with raptor nests or roosts or cavities will not be cut or burned. When conducting prescribed burns in areas with raptor nests, eagle roosts, or old growth trees, cut and remove all limbs within three feet of the ground on these trees, remove all small and shrubs within 10 feet of the tree (except no old growth trees), and pre-burn any remaining vegetation around the tree. No old growth trees will be cut or burned, regardless of species, even if they are near a nest tree where smaller trees may be cut to reduce chance of fire spread. For the purposes of this decision, old growth juniper are defined by physical characteristics (rounded tops or spreading canopies, dead branches covered with fruticose lichen, and bark with deep furrows), and old ponderosa pine are those greater than 18 inches in diameter at breast height.

Do not allow vehicles off road within ¼ mile of pygmy rabbit burrows. Do not conduct prescribed burns within ½ mile of pygmy rabbit burrows.

Pretreatment and treatment activities within mule deer, elk or pronghorn winter range will be completed within a two week window if conducted between November 1 and May 1 (depending on species, see page 47 in Upper Deschutes RMP). The Upper Deschutes RMP includes a discussion of the rationale for the closure windows for various species.

Project activity will not be allowed from **December 1 to April 1** within ½ mile of bald and golden eagle winter roost sites, or from January 1 through August 31 within ¼ to ½ mile of raptor nests (depending on species, as described on page 47 in the Upper Deschutes RMP).

### **Wilderness**

Mechanical treatments will not be allowed within Wilderness Areas, Wilderness Study Areas (WSA), or areas with wilderness characteristics. Prescribed burning may occur in these areas only if all of the following conditions (from pages 48-49 of BLM Manual H-8550-1 (USDI BLM 1995)) are met:

- Action is necessary to maintain a fire-dependent natural ecosystem.

- The action does not adversely impact wilderness values within any portion of the area.
- Only natural (e.g., rivers) or existing (e.g., roads) fire breaks are used.
- Fire camps are outside the area.
- Motorized vehicle use is minimized.
- The action is not precluded by land use plan.

Prior to any treatment, the BLM will assess the potential for the action to have an undesirable effect on these resources, ensure the action includes design features specified in the Decision Record and other relevant decisions, and modify the action as needed to reduce effects below those analyzed in the EA.

### **Vegetation**

Prior to any treatment, the BLM will complete clearances for locally important or special status plants. Clearances involve: a) assessing the potential for the action to have an undesirable effect, b) ensuring the action includes design features specified in the Decision Record and other relevant decisions, and c) recommending changes to the action that would reduce effects below those analyzed in the EA.

Around small populations of green tinged paintbrush (50 acres or less), do not broadcast burn or mow within 250 feet, and do not allow track mounted harvesting equipment within 100 feet. Around large populations of green tinged paintbrush (more than 50 acres), do not broadcast burn, mow, or use track mounted harvesting equipment on more than 50 percent of the population's area every 50 years.

Treatments will be monitored for spread of weeds or new populations. If weeds are detected, appropriate corrective action will be applied as described in existing BLM guidance. If weeds are detected, appropriate corrective action will be applied as described in the Prineville District Integrated Weed Management Plan (online at <http://www.blm.gov/or/districts/prineville/plans/activityplans.php>) or subsequent weed management plan.

All contractors and land-use operators moving surface-disturbing equipment in or out of weed infested areas will be required to clean their equipment before and after use on public land.

Contractors will be given noxious weed information at pre-work meetings and asked to report any populations of noxious weeds in or near work areas. Any weed sighting information will be forwarded to the District Noxious Weed Coordinator.

Seeds will be obtained from a certified weed-free source.

Trees with old growth characteristics will not be cut or burned. Western juniper old-growth characteristics: rounded tops or spreading canopies, dead branches covered with fruticose lichen, and bark with deep furrows. Ponderosa pine old growth: greater than 18 inches in diameter at breast height.

At least four young trees per acre will be left in old growth stands to provide recruitment trees for when the old trees die. Old growth stands are where there are five or more old growth trees per acre.

Trees with paint, signs, blazes, or fences attached to them will not be cut.

Native species will be emphasized except on more heavily disturbed sites where a combination of native and non-native species is likely to be more successful.

Seeding will be done using vehicle-mounted broadcaster at about 20 pounds per acre, or rangeland drill at about 10 pounds per acre, between November and February.

### **Grazing**

After treatments, livestock grazing will not be permitted the remainder of the calendar year, and through the growing season of the next year, or until the BLM has determined that soil and vegetation have recovered sufficiently to support livestock grazing. Livestock grazing may continue in pastures if a BLM interdisciplinary team determines the disturbance event did not result in undesirable soil or vegetative conditions, or grazing will not impede site recovery.

Livestock exclusion after disturbance events will not be required if livestock are not trailed through the affected area, and attractants (e.g., water, supplemental feed, salt) are not provided within one mile. Attractants may be closer if physical barriers (e.g., rimrock, fences) prevent livestock access to the affected area.

The BLM will allow prescribed or permitted livestock grazing if closely monitored and designed to accomplish resource objectives (e.g., to control invasive plants, or assist in getting broadcast seeds worked into the soil).

Sites proposed for prescribed burning may be rested from livestock grazing for one or two years prior to treatment.

### **Cultural**

Locate, protect and preserve historic and archaeological resources in accordance with legal authorities and policies prior to implementation (Upper Deschutes RMP and Brothers/La Pine RMP). This includes planning and conducting compliance for Section 106 of the National Historic Preservation Act. Section 106 compliance includes consultation with the Oregon State Historic Preservation Office (SHPO) and interested tribes.

All treatments will be designed to avoid disturbance to historic properties and paleontological resources. Project design shall avoid treatment to sensitive areas or modify treatments to avoid impacts.

Any new discoveries of cultural or paleontological resources during implementation will temporarily stop project activities until a district cultural specialist has completed an assessment and coordinated with SHPO, if required.

Woody debris created by treatments will not be piled within boundaries of archaeological sites.

Trees with historical significance (survey trees, blaze trees, juniper structures, etc.) will be retained.

## Visual resources

The following will apply across the project area:

- Use BLM contrast rating methods and complete VRM contrast rating worksheets (Visual Resource Contrast Rating Handbook 8431-1) during project design.
- Assess the change in contrast due to increased visibility of rights of way and adjacent structures and adjust treatments as needed to meet or exceed VRM standards.
- Design treatments to mimic patterns found in the characteristic landscape as well as to improve long distance scenic view opportunities.
- Locate actions that cause greater contrast such as landings, swamper burn piles, machine piles, etc. in order to meet or exceed VRM standards.
- In locations where trails or roads are visible or potentially visible as part of a wide, panoramic view, consider locating treatment edges at or near these routes, to avoid routes bisecting cleared areas.
- Identify existing and proposed trail and right of way routes prior to vegetation management treatments to ensure sufficient screening vegetation will be left to meet or exceed VRM standards.
- Do not locate burn piles, landings, or other major features on existing or proposed trail corridors.
- Within 200 feet of proposed trails, stumps from cut trees will be 12 inches or less, or no higher than surrounding vegetation to maintain visual aesthetics of the open, sagebrush-steppe community.
- Cut faces of visible trees will be oriented away from the trail.

The following will apply in VRM Class II Areas:

- Within VRM Class II areas visible from key observation points, do not use treatment methods that introduce high or moderate/high levels of contrast.
- Identify photo monitoring points to be used in the overall monitoring process to assess the length of short term visual impacts.
- Use computer generated seen area mapping to aid in vegetation treatment design, particularly in the location of swamper burn piles, landings, and other features that may create higher levels of contrast. On mid slopes, limit loading and yarding to bench locations not visible from key observation points. On mid slopes, limit burn pile number, size and location such that they are effectively screened from areas with high public sensitivity such as highways and high public use areas.
- Leave adequate junipers along property lines (meander the treatment boundary) to avoid strong line and color contrast between BLM and private property, unless fuels can be treated simultaneously on BLM and adjacent private property.
- Leave adequate junipers along property lines to partially screen views of structures from view from areas of high public sensitivity.
- Limit heavy equipment use to designated equipment trails and existing roads. Designated equipment trails will be rehabilitated following use. Rehabilitation will involve “erasing” the trail by pulling in berms, or covering with branches, brush, boulders, etc. such that the trail is disguised and can be naturally revegetated or artificially seeded.

- On slopes above 20 percent, do not use skidders or other treatment methods that potentially produce high or high/moderate contrast potential or other mechanical treatments that leave vertical lines on the slopes.
- On moderate and steep slopes, do not use a consistent treatment along the entire length of existing roads and ROWs, particularly those that are perpendicular to the slope. Consistent and similar mechanical treatments (e.g., boom operated fellers) along both sides of roads/utility lines serve to strengthen the dominance of these linear features, which contrast with the characteristic landscape.
- Burn piles will not be used on slopes above 20 percent in immediate foreground view of key observation points, unless they can be strategically located to effectively screen them by placing in blind areas behind leave tree crowns.
- All stumps will be no higher than 4 inches on the uphill side within 200 feet of designated roads and trails. Based on post treatment evaluation, BLM may paint visible cut faces (stumps and stems) with an appropriate color selected from the BLM list of environmental colors and selected to match the surrounding landscape post treatment type.
- Hand cutting of trees within 200 feet of designated roads and trails will include scattering of slash and moving of tree stems outside of immediate viewshed of designated roads and trails and scattering sufficiently to reduce height below or equal to surrounding shrub vegetation. If no screening shrubs exist, trees will be removed outside the trail corridor and treated by lop and scatter, chipping or other methods.
- Hand piling and burning will be done outside of the immediate foreground view of designated roads and trails.

In VRM Class I, the following PDFs would apply:

- Cutting, crushing and mowing would not be permitted in VRM Class I areas.
- Prescribed burning would be permitted in these areas only when the applicable PDFs listed above for VRM Class II are applied.
- No treatments would occur in the Horse Ridge Area of Critical Environmental Concern/Research Natural Area.

## **Soil**

This section describes project design features that will ensure maintenance of soil productivity.

### **Objectives**

- Limit annual grass expansion – Do not increase existing annual grass foliar cover by more than 5 percent absolute throughout area burned.
- Maintain perennial bunchgrass cover – Do not reduce existing perennial grass foliar cover by more than five percent absolute throughout area burned.
- Keep detrimental soil impacts (see definition below) to ≤ to 15 percent of the treatment area – This applies to non-sensitive soil areas for water or wind erosion. If detrimental impacts are greater than 15 percent of the treatment area, use restoration treatments such as erosion control treatments, subsoil tillage for compacted ground, and seeding native plants for areas with soil sterilization or soil displacement.
- Apply restoration treatments to all detrimentally impacted soils in sensitive soil areas.

## Definitions

A **detrimental soil impact** is when native perennial grass cover is not expected to re-establish itself naturally on the affected or disturbed area within two years after the disturbance.

**Fall burning** generally occurs late August through early October, when fuel moisture levels are lowest for the year.

A **sensitive soil area** is any soil area with properties that meet one of the HIGH threshold criteria in the table below.

**Table 1 – Soil vulnerability to site degradation**

Properties <sup>1</sup>	LOW	MODERATE	HIGH	Restrictive feature
Slope (percent) Kw < 0.20 <sup>2</sup> Kw 0.20 – 0.36 Kw >0.36	<20 <15 <10	20 - 40 15 - 35 10 - 25	>40 >35 >25	Steep slopes – Water erosion
Wind erodibility group (Surface layer) <sup>3</sup>	5, 6, 7, 8	3,4, 4L	1, 2	Wind erosion hazard
Available water capacity (average to 40 inches or limiting layer) (inches)	>0.10	0.05 - 0.10	<0.05	Droughty soils
Salinity (MMHOS/CM) (surface layer)	<8	8 - 16	>16	Excess salt
Sodium adsorption ratio (surface layer)	<8	8 - 12.9	≥13	Excess sodium
Depth to bedrock/ cemented pan (inches)	>20	10 - 20	<10	Rooting depth
Soil moisture regime	Xeric or wetter: avg. annual or effective precipitation ≥12 inches	Xeric or wetter: avg. annual or effective precipitation ≥12 inches	Aridic or drier: avg. annual or effective precipitation <12 inches	Dry effective soil moisture regime

<sup>1</sup> Use the representative value for the range in soil properties for Available water capacity, Salinity, Sodium adsorption ratio, and Depth to bedrock/cemented pan.

<sup>2</sup> For each of the three Kw ranges under slope, a) use the representative value for the range in soil properties, and b) K Factor of surface layer adjusted for the effect of rock fragments (Kw).

<sup>3</sup> The wind erosion hazard was determined by looking at the Wind Erodibility Group (WEG) of the soil. The soil's WEG represents the soil's resistance to soil blowing, and is based on the soil properties of the surface layer. Soil properties used to determine WEG include soil texture, organic matter content, presence of carbonates, rock fragments, and mineralogy.

Slope and aspect	All slopes and aspects that do not meet the criteria for HIGH Vulnerability	All slopes and aspects that do not meet the criteria for HIGH Vulnerability	Areas with slope gradients >12% on S, SW, or SE aspects (113-247 degrees)	Dry aspect slope
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## Prescribed burning

Fall prescribed burning will be allowed when 1, 2, or 3 are true:

1. On sites with any slope or aspect and all three of the following are true:
  - Idaho fescue is greater than 10 percent of the total stand foliar cover and Idaho fescue is found in the plant interspaces (openings between trees and shrubs) not just in the shade of trees
  - Cheat grass is less than 5% of the total stand foliar cover
  - Rabbit brush is less than 5% of the total stand foliar cover

AND one of the following is true:

- Mountain big sagebrush makes up 96% or more of the sagebrush shrub community which means Wyoming big sagebrush or Basin big sagebrush is less than 5%; AND soil moisture regime is Xeric = (average annual precipitation or effective precipitation is greater than 12 inches) and ecological condition is Mid Fair, Good or Excellent
  - Soil moisture regime is Aridic= (average annual precipitation or effective precipitation is less than 12 inches) and ecological condition is Good or Excellent
2. On sites where the slope is > 12 percent and the average annual precipitation is > = 8 inches and all of the following are true:
    - Aspect is between 300 to 360 and 0 to 50 degrees (NNW, N, NNE)
    - Cheat grass is < 5% total stand foliar cover
    - Rabbit brush < 5% total stand foliar cover
  3. On poor to mid fair ecological condition sites (regardless of slope, aspect, or annual precipitation) where a restoration seeding treatment is planned and will result in an increased amount of shrub and/or perennial grass cover over what currently exists.

Fall prescribed burning will not be allowed on sensitive soil areas (definition, above) if:

- The aspect is south and average annual precipitation is less than 14 inches.
- The aspect is east or west and average annual precipitation is less than 12 inches.

Prescribed burn treatments that include **single tree** burns will only be allowed when:

- The ground is frozen and/or covered with snow, or in the early spring when the soil is wet. Additionally,
- Eighty percent of the burned juniper needles are left non-volatilized (needles remain on branches).
- Before burning trees that are 18 feet or taller, remove all limbs 3 feet or less from the ground to maintain 90 percent of foliar perennial bunch grass cover at the base of the burned tree.

Treatments that include swamper, jackpot, or hand pile burns may be used on any site, regardless of slope, aspect, annual precipitation, or soil sensitivity, as long as they are done when the ground is frozen and/or covered with snow, or in the early spring when the soil is wet.

### **Mechanical juniper treatments**

This can be done by hand with a chainsaw, or with heavy equipment (see restrictions on equipment, below). Leave slash in contact with the ground unburned or jackpot burn when the ground is frozen and/or covered with snow or in the early spring when the soil is wet.

### **Equipment use (including vehicles and heavy equipment)**

The following will apply to equipment used for any treatment:

- To reduce effects from soil compaction, operate equipment when soils are dry or frozen. Soils are wet when they are at or above field capacity in the top three inches of the soil surface. Cease operations when equipment tracks are creating ruts  $\geq 3$  inches deep with one pass or when equipment is slipping or sliding.
- Do not use crawler tractors with brush rake for building slash machine piles.
- To reduce soil disturbance and compaction, machine pile using excavator with grapple.
- As an alternative to machine or hand pile burning, masticate or chip fuel loads on site.
- Limit ground based mechanical treatments to slopes of less than 35 percent.
- Operate equipment smoothly and efficiently to limit sharp turns, moving backward and forward over the same piece of ground causing soil displacement, compaction and increasing potential for erosion.
- Limit equipment passes to four or fewer trips over a single piece of ground to prevent a detrimental soil impact. If five or more trips are likely, designate skid trails 100 feet or more apart.
- Twelve inches or more of continuous slash on a skid trail will allow a "forwarder" to transport logs from the treatment area to a landing using more than five passes without causing detrimental soil compaction.

### **Restoration**

- Apply erosion control treatments (i.e. water bars or water dips) to abandoned skid trails and camouflage skid trails next to the existing road system to prevent people from driving these trails. This will apply to all areas; however, erosion control treatments will only be necessary where needed to prevent site degradation.
- Apply erosion control or subsoil tillage treatments to newly created juniper thinning access routes after the treatment is complete.
- Fell juniper on newly created juniper thinning access routes when finished with the juniper thinning projects. Block and camouflage access to prevent the transportation network from increasing in extent.
- Subsoil till compacted ground to improve the chance for native plant re-establishment. This will be used on landings, skid trails, or unauthorized routes. This will generally only be done if detrimental soil impact exceeds 15 percent of the treatment area.
- Do not subsoil till when the soil is wet as the desired compaction layer shattering will not occur.
- Do not subsoil till when soil is frozen.
- Do not subsoil till if soil is less than or equal to 12 inches deep to bedrock or a dense pan layer.

- If shanks on the equipment used to subsoil till won't go into the ground because it is too hard, pull slowly in over a fill slope or dig a trench with cat blade and enter from the trench.
- Use 2 shanks with wider wings instead of 3 for coarse stony soils and when brush is dense. Stones and brush will pass through the shanks with this setup.
- On roads and trails and on steeper grades (greater than 10 percent), subsoil till the full width of the compacted roadbed, including the ditch line, to insure more even distribution of moisture. If the full width is not subsoil tilled, water flow in uneven subsoil tillage will be concentrated without an outlet, potentially creating an erosion problem.
- Do not concentrate any runoff to the subsoil tilled area.
- Compacted roads will not transmit water into the road-bed, so could subsoil till during the winter if surface is not too wet or puddled. Better to subsoil till in the spring than in the fall. Moisture can be drawn up into the upper profile in the fall, which will extend the time that an area can be subsoil tilled. However, there is a point when the compacted zone is too dry and will fracture in large blocks. It is preferred for the top compacted zone to fracture into medium to small fractures and not leave big non-fractured chunks. This tends to happen when too dry or when subsoil tilling a thick bunch of compacted sod.
- A better subsoil tillage result (energy transfer) is produced by going slower rather than faster in tilling.
- For excavator subsoil tilling, pull logging slash and debris and soil organic matter (SOM) into the skid trail from areas surrounding the skid trail. For improved soil productivity add organic matter.
- Implement erosion control treatments on all routes, ways and skid trails showing signs of erosion, rutting and/or uncharacteristic water flow paths, rills, gullies or deposition. Install erosion and sediment barriers for controlling water flow and drainage to stabilize the soil. For permanent well-traveled roads, use water dips instead of water bars to make travel easier.
- Drill or seed on the contour for slope gradients greater than 5 percent.