Otis Mountain/Moffet Table Fuels Management Project

ENVIRONMENTAL ASSESSMENT OR-06-025-056

Bureau of Land Management
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CHAPTER I: PURPOSE OF AND NEED FOR ACTION

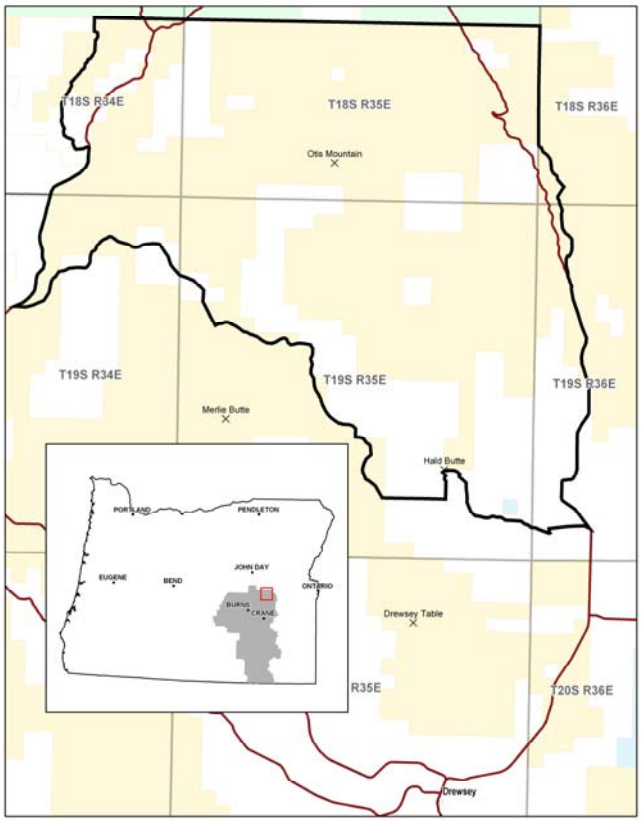

Figure 1.1 The Otis Mountain/Moffet Table Project Vicinity Map.

A. Background

The Burns District Bureau of Land Management (BLM) proposes to implement fuels management and ecosystem restoration treatments within the Otis Mountain/Moffet Table Project Area in the Three Rivers Resource Area. Prescribed fire and silvicultural thinning activities would be primary management tools.

The Otis Mountain/Moffet Table Project Area encompasses approximately 22,547 acres of BLM-managed lands and 10,835 acres of privately owned lands within portions of six grazing allotments north of Drewsey, Oregon. Grazing allotments included within the Project Area include: Birch Creek (T. 18 S., R. 35 E., Sections 20-21; 28; 33), Otis Mountain (T. 18 S., R. 35 E., Sections 22-27; T. 18 S., R. 36 E., Section 31; T. 19 S., R. 35 E., Sections 1-3; 10-15; T. 19 S., R. 36 E., Sections 6-7; 18), Moffet Table (T. 18 S., R. 34 E., Sections 23-26; 34-36; T. 18 S., R. 35 E., Sections 19-21; 28-33; T. 19 S., R. 34 E., Sections 1-3; 10-12; T. 19 S., R. 35 E., Sections 5-7; 17-18), Mule Creek (T. 18 S., R. 35 E., Sections 32-33; T. 19 S., R. 35 E., Sections 4-5; 8-9), Newell Field (T. 19 S., R. 35 E., Sections 14-15; 22-23; 26), and Big Upson Field (T. 19 S., R. 35 E., Sections 13; 24-25). Major road access to the project is provided by the Otis Valley Road along the eastern boundary of the Project Area and Forest Service Road 14 on the western boundary.

Rangeland plant communities represented in the Project Area are dominated by species such as mountain big sagebrush (*Artemisia tridentata ssp. vaseyana*), bitterbrush (*Purshia tridentata*), curlleaf mountain mahogany (*Cercocarpus ledifolius*), Wyoming big sagebrush (*Artemisia tridentata wyomingensis*), low sagebrush (*Artemisia arbuscula*), and stiff sagebrush (*Artemisia rigida*). The Project Area supports stands of quaking aspen (*Populus tremuloides*), willow (*Salix spp.*), and chokecherry (*Prunus virginia*) within the Birch Creek, Squaw Creek, Bluebucket Creek, and Otis Creek drainages. Aspen are also present in the Project Area within isolated upland pockets. Western juniper (*Juniperus occidentalis ssp. occidentalis*) is encroaching upon all rangeland and riparian plant communities in the Project Area to various degrees.

Forested stands in the Project Area were historically dominated by large fire resistant ponderosa pine (*Pinus ponderosa*) and lesser amounts of Douglas-fir (*Pseudotsuga menziesii*) at higher elevations and on north-facing slopes. Now, the understory and middlestory of these stands are crowded with fire-intolerant small diameter trees and canopies are often in a closed condition.

Between 1870 and 1900, rapid increases in juniper stand establishment within sagebrush-steppe plant communities coincided with the onset of favorable climatic conditions, major changes in land-use patterns, and decreases in fire frequency and intensity, throughout eastern Oregon. A subsequent increase in the density of juniper forests in the region occurred between 1879 and 1918. Fire return intervals in mountain big sagebrush/bunchgrass plant association groups varied between 15 and 25 years prior to Euro-American settlement (Miller and Rose 1999). Increasing the distribution and density of juniper within shrubland and grassland ecosystems can dramatically impact biodiversity, hydrologic cycles, fauna, and nutrient cycling (Bates et al. 1999). The most frequently cited cultural factors involved in the historic[1] expansion of juniper involve the introduction of sheep and cattle grazing at the end of the 19th century. Prior to the introduction of the Taylor Grazing Act in 1934, many Federal and unclaimed lands in the American West were heavily overgrazed during an intense competition between stockmen for a badly deteriorated public range (Foss 1960). Unregulated livestock grazing resulted in the removal or reduction of herbaceous fine fuels from the understory of shrubland plant communities, thereby reducing fire frequency, intensity, and area burned. Fire suppression also contributed toward the trend of fire exclusion as tactics and technologies advanced over time.

The shift in land-use practices that accompanied Euro-American settlement also transformed the structure and composition of forestland plant communities in the region. Prior to 1890, the fire return interval in lower elevation fire-adapted forests common to the southern Blue Mountains varied between 5 and 23 years (Maruoka and Agee 1994). The low intensity/high frequency disturbance regime favored development of fire resistant trees such as large ponderosa pine and to a lesser extent larger Douglas-fir.

[1] **Historic**: Refers to a period prior to 1900 throughout this document.

It also favored development of open stands with scant ladder fuels. The exclusion of wildland fire combined with early logging methods have resulted in overstocked stand conditions, high levels of forest litter, increased ladder fuels, and increased proportions of fire-intolerant trees such as Douglas-fir and grand fir (Hann et al. 1997; Swetnam et al. 1999). Large-scale wildfires that occur under this condition can be dangerous and unpredictable events that threaten human life, private property, and cause extreme forms of resource damage. At the lower fringes of this forest type, ponderosa pine and western juniper have invaded meadows and other areas where conifers were not historically prevalent. There is an increasing realization that the forests and woodlands of the Blue Mountains have evolved with fire and that historical conditions were often more resilient and sustainable than the present condition (Langston 1995).

Figure 1.2 Landscape view of the Otis Mountain/Moffet Table planning area from Antelope Lookout in 1935. Note the open condition of trees and shrubs scattered along the creek bottom.

Figure 1.3 Landscape view of the Otis Mountain/Moffet Table planning area from Antelope Lookout in 1995. Note that a dramatic increase of conifers has occurred throughout the drainage since the 1935 photograph was acquired.

B. Conformance with Applicable Land Use Plans

The Otis Mountain/Moffet Table Fuels Management Environmental Assessment (EA) is tiered to the Record of Decision for the **Three Rivers Resource Management Plan/Final Environmental Impact Statement** (RMP/FEIS) of 1992.

This EA will consider the environmental consequences of the proposed action and no action alternatives in order to provide sufficient evidence for determining whether the anticipated impacts would exceed those considered in the RMP/EIS and require the preparation of a Supplemental EIS.

In addition to the RMP/EIS, this analysis incorporates management objectives and analysis of consequences by reference:

The **Burns Interagency Fire Zone Fire Management Plan** (2004). The Project Area lies entirely within the Upper Malheur Fire Management Unit.

Four of the five key points set forth within the **National Fire Plan.**[2] Additionally, the proposal responds to the goals of A Collaborative Approach for Reducing Wildfire Risk to Communities and the Environment: 10-Year Comprehensive Strategy.[3]

The key points of the National Fire Plan are:

1) Firefighting preparedness
2) Rehabilitation and restoration of areas affected by wildfire
3) Hazardous fuels reduction
4) Promote community assistance
5) Accountability

The goals of the 10-Year Comprehensive Strategy are:

1) Improve fire prevention
2) Reduce hazardous fuels
3) Restore fire-adapted ecosystems
4) Promote community assistance

[2] **National Fire Plan (NFP)**: A collection of policies and documents for actively responding to severe wildland fires and their impacts to communities while ensuring sufficient firefighting capacity for the future (http://www.fireplan.gov).
[3] http://www.westgov.org/wga/initiatives/fire/final_fire_rpt.pdf

The **Harney County Community Wildfire Protection Plan** (CWPP) founded on the NFP and the related 10-Year Comprehensive Strategy in Harney County (PF-IRA-006, DNRC et al. 2005). The CWPP was completed in July 2003 through a collaborative effort with a diverse group of interested parties. The purpose and need of the proposed action are in conformance with the CWPP goals of protecting communities, rural residences and structures, grazing lands, recreational lands, and cultural resources. The CWPP recommends that hazardous fuels reduction projects focus on Fire Regime Condition Class (FRCC) 3 (Chapter V, Wildfire Mitigation Plan) lands and private landowners collaborate with Federal agencies to make fuels management efforts more effective.

Finally, the proposed action is in compliance with State, tribal, and local laws, regulations, and land use plans.

C. Purpose of and Need for Action

The primary purpose of the proposed action is to move toward management objectives described in the Three Rivers Proposed Resource Management Plan (PRMP) within the Otis Mountain/Moffet Table Project Area by reducing hazardous fuels, restoring plant communities, and improving wildlife habitat diversity. The emphasis on treatments in forested areas would be to reduce densities of small diameter trees and selectively removing larger trees so as to reduce crown fire hazards. The emphasis in shrublands, woodlands, and riparian areas would be to move conditions toward historic species composition and structure while reducing fuels in the vicinity of Drewsey, Oregon, and numerous ranches, homes, and dwellings. Drewsey was identified as a community at risk in the Harney County CWPP (2005).

Any action alternative to be given serious consideration as a reasonable alternative must meet the objectives provided in the Three Rivers RMP and statute for projects to be implemented in the Project Area. The RMP Objectives and the supporting Otis Mountain/Moffet Table Project Objectives were used to eliminate potential action alternatives from detailed analysis.

- A purpose of the proposal is to reduce the horizontal and vertical fuel continuity and loading of forests and pine woodlands to reduce the chances of a surface fire becoming a crown fire, and a small fire becoming a stand-replacement wildfire. Reducing fuels would not only help protect life, property, and resource values on private and public lands, but will also increase the safety for wildland firefighters.

Supporting RMP Objective: Fire Management Objective 1 (RMP, p. 2-101): As determined through the values at risk analysis, maximize protection of life, property, and high value sensitive resources from the detrimental effects of wildfire.

Project Objectives:

- Reduce canopy closure[4] in pine forest and pine woodland stands to a mean total of 30 percent across the landscape.
- Increase canopy base height[5] in pine forest and pine woodland stands to a mean of 20 feet above the ground surface.
- Reduce surface fuels in forested stands from 7 tons per acre to approximately 3 tons per acre.
- Reduce the density of understory trees that act as ladder fuel in pine forests or pine woodlands so that they are spaced at an average of 22 feet within treated stands.
- Reduce the woody fuel loading within western juniper encroached mountain big sagebrush communities in the Project Area. Reduce 1-one hour and 10-hour time lag fuels[6] by a mean total of 90 percent and 100-hour fuels by a mean total of 75 percent.

➢ A purpose of the proposal is to improve the vigor and resiliency of fire-dependent ecological communities to wildfire, insects, disease, and other disturbances. Reintroducing fire into shrublands, grasslands, forestlands, and riparian areas would move stands toward historic plant associations, support greater wildlife species diversity; and enhance watershed function.

Supporting RMP Objective: Vegetation 1 (RMP, p. 2-51): Maintain, restore, or enhance the diversity of plant communities and plant species in abundances and distributions which prevent the loss of specific native plant community types or indigenous plant species within the Resource Area.

Project Objective:

- Move mountain big sagebrush/bunchgrass plant communities and hydrological conditions within the Project Area toward historic conditions by reducing live western juniper density by a mean total of 70 percent within burned areas.

Supporting RMP Objective: Forestry and Woodlands Objective 1 (RMP, p. 2-24): Manage approximately 50,000 acres of available productive noncommercial forestlands and woodlands for the enhancement of habitat diversity, minor forest products, watershed protection, and rangeland productivity.

[4] **Canopy Closure:** Ground area covered by the canopy of trees.
[5] **Canopy Base Height:** The height of the lowest portion of the canopy in a given stand of trees.
[6] **Timelag Class:** A method of categorizing fuels by the rate at which they are capable of moisture gain or loss, indexed by size class. One hour fuels typically dry within one hour and are ¼ inch or less in diameter. Ten hour fuels generally dry within 10 hours and are ¼ inch to one inch in diameter.

Project Objective:

- Move pine forest, pine woodland, and pine savannah stand densities, structure, and composition toward historic conditions within the Project Area.

Supporting RMP Objective: Fire Management Objective 2 (RMP, p. 2-101): Consistent with the values at risk analysis, maximize the beneficial use of prescribed fire and wildfire to achieve other resource management objectives.

Project Objective:

- Reintroduce fire as a disturbance process in mountain big sagebrush/bunchgrass, low sagebrush/bunchgrass, Wyoming sagebrush/bunchgrass, and ponderosa pine woodland and forest communities within the Project Area.

- A purpose of the proposal is to improve the quality and productivity of forage species available to wildlife and livestock in the Project Area. Bunchgrasses and forbs, important forage for elk, mule deer, antelope, domestic livestock and avian species, have been reduced or are completely absent in plant communities undergoing conversion to juniper woodlands and in closed canopy ponderosa pine forest stands. Key wildlife browse species such as bitterbrush and mountain mahogany are declining under the influence of western juniper expansion.

Supporting RMP Objective: Wildlife 7 (RMP, p. 2-74): Restore, maintain, or enhance the diversity of plant communities and wildlife habitat in abundances and distribution which prevent the loss of specific native plant community types or indigenous wildlife species habitat within the Resource Area.

Project Objectives:

- Reduce western juniper encroachment into key wildlife habitat dominated by bitterbrush, mountain mahogany, aspen, or riparian hardwoods by 90 percent within the Project Area while maintaining habitat values.
- Reduce post-settlement western juniper density by 90 percent on low sagebrush/bunchgrass ecological sites that are targeted to improve sage-grouse habitat.
- Increase forage available to big game and other wildlife on public and privately owned lands in the Project Area while retaining adequate cover.

Supporting RMP Objective: Grazing Management 1 (RMP, p. 2-33): Resolve resource conflicts and achieve management objectives as identified for each allotment.

Project Objective:

- Increase forage available to domestic livestock on lands within the Otis Mountain, Moffet Table, Mule Creek, Birch Creek, Newell Field, and Big Upson Field grazing allotments.

- A purpose of the proposal is to capture the economic value of cut trees as sawlogs and biomass where feasible. This would reduce treatment costs incurred by the agency and supply raw materials and jobs that contribute to community stability.

Supporting RMP Objective: Forestry and Woodlands Objective 1 (RMP, p. 2-21): Manage the 7,772 acres of identified commercial forestland timber base for a nondeclining sustained yield.

Project Objective:

- Supply timber products and/or woody biomass while reducing management costs to the government.

Project Decision Factors

These additional decision factors will by relied upon by the Deciding Official in selecting between the no action alternative and the proposed action.

1. The degree to which the alternative achieves project objectives in a manner that considers the health and safety of the public and fire management personnel.
2. The degree to which the alternative achieves project objectives in a manner that is cost-effective.
3. The degree to which the alternative would allow the BLM and owners of private lands within the Project Area to cooperatively address shared fuels reduction and rangeland restoration goals and objectives.

Issues Considered but not Analyzed Further: An intensive inventory evaluating the presence of wilderness characteristics on the BLM-administered lands in Otis Mountain and Moffet Table Fuels Management Project was completed in March of 1980. The final intensive inventory decision (Wilderness Review Intensive Inventory in Oregon and Washington, March 1980) found that wilderness characteristics were not present on these lands. In March of 2007 inventory maintenance was completed by an interdisciplinary team (IDT) who reviewed current conditions and documented changes that had occurred since the original inventory was completed. No changes to conditions were identified that would modify the findings of the 1980 inventory therefore wilderness characteristics have been determined not to be present and this issue will not be analyzed further in this EA.

CHAPTER II: ALTERNATIVES INCLUDING THE PROPOSED ACTION

A. No Action Alternative

Under this alternative, there would be no application of prescribed fire, cutting of conifers in stands of mahogany or aspen, thinning of forestlands, or temporary protection fencing erected around aspen stands. Conversion of rangelands to juniper woodlands within the Project Area would continue over time. The risk of a high intensity crown fire occurrence in the Project Area would escalate as the density and distribution of fuels become increasingly hazardous. Management under the no action alternative would proceed under the current Three Rivers RMP and all other relevant policy direction.

B. Proposed Action

The proposed action is to utilize a combination of prescribed burning and silvicultural thinning to reduce fuels and restore fire adapted ecosystems on 5,000 acres of ponderosa pine dominated forests and woodlands; and 26,500 acres of sagebrush-steppe within the Otis Mountain/Moffet Table Project Area. The proposed action consists of five separate treatments and seven activities. Under each treatment are management objectives and prescribed fire and/or mechanized activities that would be utilized to meet the objective. Meeting the objectives described under each treatment should, in turn, satisfy the project objectives described in Chapter I, Purpose of and Need for Action. The Activities Section describes each of the prescribed fire and mechanical activities that would be utilized to meet the treatment objectives in detail. Twenty one project design criteria, for protection or maintenance of specific resource values, have been incorporated into the proposed action. Project design elements are the result of recommendations made by an IDT and approval by the deciding official. A detailed list of project design elements is presented in Section D of Chapter II (Alternatives Including the Proposed Action).

Treatments would take place on public and privately owned lands within portions of the Otis Mountain, Moffet Table, Birch Creek, Mule Creek, Upson Field, and Newell Field grazing allotments that comprise the Project Area between 2007 and 2019. The proposed action would be implemented on the privately owned lands in the Project Area only under written agreement between landowners and the BLM.

Proposed Action Treatment Descriptions

Silvicultural Thinning for Hazardous Fuels Reduction Treatment: Noncommercial thinning, commercial thinning, pile burning, underburn

Under this treatment, a silvicultural thinning prescription followed by prescribed fire for the purpose of fuels management would be applied to a majority of stands of ponderosa pine and Douglas-fir in the Project Area, particularly on approximately 5,000 acres within the Bluebucket, Rudy, and possible pine woodland treatment areas (Figures 2.1 and 2.2).

In the Bluebucket, Rudy, and designated pine woodland treatment areas, ladder fuels would be reduced sufficient to interrupt the initiation of a crown fire by reducing the density of understory trees so that they are spaced at an average of 22 feet. It is also an objective to reduce potential for crown fire spread by reducing canopy closure to a mean total of 30 percent across the pine dominated forests and woodlands in the Project Area.

The noncommercial thinning aspect of the silvicultural thinning treatment would target stands composed primarily of small diameter (<9-inch diameter) ponderosa pine to reduce stocking and fuel laddering on forested sites. Commercial harvest of large diameter (> 9-inch diameter) trees would be implemented to decrease canopy continuity within ponderosa pine dominated forest and woodland within the Project Area. The thinning prescription would promote or retain the largest and most well-formed ponderosa pine while breaking up horizontal and vertical fuel continuity within the stand. Following thinning, spacing between trees would be variable with clumps of conifers left in place to provide for diversity and meet habitat needs.

If economically feasible, nonsawlog material generated by silvicultural thinning activities would be removed for biomass utilization.[7] Otherwise, the treatment would include a follow-up application of piling and burning, and then underburning to reduce surface fuels. The objective for the prescribed fire phase of the treatment would be to reduce surface fuels by a mean total of more than 50 percent in treated units.

Fuels generated by thinning activities that are not removed for biomass utilization would be treated by piling and burning, mechanical crushing or whole tree yarding. An underburn would be conducted within 10 years of the thinning treatment to further reduce ground fuels (litter, twigs, branches <3 inches) in the same stands. Deep duff may be raked away from around the bases of old growth ponderosa pine trees, large snags, and large downed woody debris prior to underburning if necessary. Accomplishing these objectives would result in approximately 5,000 treated acres. This treatment would require construction of approximately 2 miles of temporary road.[8]

Mountain Big Sagebrush/Bunchgrass Restoration Treatment: **Broadcast burn, pile burning, jackpot burning**

A management objective is to treat between 80 and 90 percent of acreage within the Project Area that is classified as mountain big sagebrush–bunchgrass plant community with some form of prescribed fire under the proposed action. Broadcast burning would be applied to between 40 and 60 percent of acreage classified as mountain big sagebrush/bunchgrass in an early to middle phase of transition to juniper woodland (Table 3-1). If this objective is exceeded during implementation of a broadcast burn in any particular pasture, then a corresponding amount of acres classified as mountain big sagebrush/bunchgrass in similar condition would be removed from treatment consideration in a subsequent pasture.

[7] **Biomass Utilization**: Materials grown in forest or woodland environments that are by-products of land management, restoration, or fuel reduction treatments (historically nonutilized or underutilized material).

[8] **Temporary Road**: A road constructed for timber harvest that would be closed with a tank trap at the entrance and then ripped, reseeded at the close of the timber sale.

Likewise, if the broadcast burning objective is not met within a particular pasture, additional acres would be treated later in the project. Conifer cutting followed by piling and burning or jackpot burning may be applied to any mountain big sagebrush/bunchgrass communities in the early-middle transitional stages that are not subject to broadcast burning.

It is also an objective to treat between 90 and 100 percent of mountain big sagebrush plant communities in the latter stages of transition to juniper woodlands under the proposed action. These acres are in addition to the area that would be burned to reduce the density of juniper in mountain big sagebrush/bunchgrass communities that are in the early to middle stages of conversion to juniper woodland. Following a broadcast burn, additional cutting followed by jackpot burning or piling and burning may be authorized within a treatment area if necessary to meet juniper mortality objective.

Broadcast burning and pile burning would be the primary activities utilized in the Mountain Big Sagebrush/Bunchgrass Restoration treatment. A secondary treatment in mountain big sagebrush/bunchgrass communities could be conifer cutting followed by jackpot burning. Jackpot burning may be substituted in situations where it is determined that a broadcast burn or piling and burning would not be suitable due to resource related concerns.

Lesser amounts of jackpot burning, underburning, juniper cutting may be employed to increase the effectiveness of holding actions near unit boundaries, property lines, or interior leave islands. Patches of expansion juniper would be retained (Section C - Project Design Elements) for big game thermal and hiding cover. There are approximately 18,000 acres of mountain big sagebrush/bunchgrass plant communities within the Project Area that have been affected by conifer encroachment.

Low Sagebrush/Bunchgrass Habitat Enhancement Treatment: Jackpot burn, juniper cutting, broadcast burning.

A management objective is to treat between 60 and 80 percent of low sagebrush plant communities that are affected by western juniper encroachment under the proposed action. If this treatment objective is exceeded in any particular burn unit, then a corresponding amount of acres classified as low or stiff sagebrush plant communities in a similar condition would not be treated in a subsequent pasture. There are approximately 6,000 acres of low/stiff sagebrush plant communities within the Project Area that have been affected by juniper encroachment.

Low sagebrush/bunchgrass communities may be treated with juniper cutting and prescribed fire or a juniper cutting only activity. Cutting and jackpot burning would be the primary tools utilized to reduce juniper encroachment on low sagebrush sites that are discrete and can be isolated from broadcast burn treatment units. The juniper cut and leave activity may be applied if it is determined that downed trees would not present a hazardous fuels issue on the site. Broadcast burning would only be utilized in situations where low sagebrush ecological sites are intermixed with mountain big sagebrush stands to a large degree and cannot be readily separated from a broadcast burn treatment unit.

Wyoming Sagebrush/Bunchgrass Restoration Treatment: Jackpot burn, pile burning, juniper cutting.

A management objective is to treat between 90 and 100 percent of Wyoming sagebrush/bunchgrass plant communities that display any level of western juniper encroachment under the proposed action. There are approximately 3,800 acres of Wyoming big sagebrush plant communities within the Project Area that have been affected by juniper encroachment. Resource advisors would recommend application of this treatment option to the deciding official if a stand of Wyoming sagebrush is identified within a potential burn unit.

Juniper cutting followed by jackpot burning and piling and burning would be the primary activities utilized in the Wyoming sagebrush/bunchgrass restoration treatment. Small amounts (less than 100 acres) of the juniper cut and leave activity may be utilized in Wyoming sagebrush treatment areas if it can be applied without creating hazardous fuels. In no circumstance would stands of Wyoming sagebrush be intentionally broadcast burned under the proposed action.

Big game Browse Maintenance/Deciduous Vegetation Enhancement Treatment: Jackpot burn, pile burning, conifer cutting, broadcast burn

It is a management objective to treat 90 to 100 percent of shrubland dominated by mountain mahogany or bitterbrush affected by conifer encroachment and occurring in patches of at least one-eighth acre under the proposed action. An additional objective would be to treat any stands or isolated groves of quaking aspen or deciduous woody riparian communities that are under the influence of encroachment. Accomplishing this objective would result in no more than approximately 3,500 treated acres within the Project Area. Resource advisors would recommend application of this treatment option to the deciding official if sufficient bitterbrush, mahogany, or deciduous woody vegetation is identified onsite.

Conifer cutting, pile burning, and jackpot burning would be the principal tools used under this treatment to reduce encroachment of conifers into stands of mountain mahogany, bitterbrush, or deciduous woody vegetation while maintaining existing plants.

Manual cutting of conifers with no follow-up burning may also be occasionally used in such stands. Late season broadcast burning would be applied for the purpose of aspen restoration wherever possible. This treatment may also include construction of woven wire exclosures around stands of aspen following the application of prescribed fire. Exclosures would remain in place until suckers or saplings attain a height that is above the reach of most grazing animals as determined by rangeland monitoring.

Proposed Action Activity Descriptions

Prescribed Burning

Prescribed burning would be used to varying degrees in all five of the fuels management treatments. These treatments would include activities such as broadcast burning, piling and burning, jackpot burning, and underburning.

Burning prescriptions[9] would vary depending on specific objectives and would provide for fire behavior to reduce the stocking of fully and partially developed juniper woodlands and reduce existing surface fuels in pine dominated forests and pine woodlands. Broadcast burning would be the most widely applied activity under the proposed action as it is the most cost-effective method of reintroducing fire as a disturbance process over large areas where it can safely carry through surface and ladder fuels. Broadcast burning would be the primary form of treatment used in the mountain big sagebrush/bunchgrass dominated ecological sites and it would account for more than 65 percent of the treated acreage in the Project Area. Pile burning would most often be applied in areas where it is an objective to substantially reduce heavy fuels while limiting the size of burned patches and/or retaining a majority of existing understory plants. Jackpot burning would be applied during treatments in which it is an objective to reduce only fine fuels and small diameter fuels while preserving desirable understory species, limiting the size of burned patches, and minimizing potential for soil sterilization. Jackpot burning may also be utilized as pretreatment before a broadcast burn in order to protect fire-sensitive assets such as a range improvements or cultural resources, or to improve the effectiveness of holding actions[10] near a unit or property boundary. Underburning would only be applied in pine dominated forests or pine woodlands to reduce surface fuels without damaging overstory trees.

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[9] **Prescription:** A plan specifying management objectives to be obtained, and air temperature, humidity, season, wind direction and speed, fuel, and soil moisture conditions under which a fire will be started or allowed to burn.

[10] **Holding Action:** Any action taken to stop the spread of fire.

Although the target treatment areas consist of the sections of the Otis Mountain, Moffet Table, Birch Creek, Mule Creek, Newell Field, and Big Upson Field grazing allotments that form the Otis Mountain/Moffet Table Project Area (Figure 1.1), there are areas adjacent to Project Area boundaries where burning is allowable without declaration of a wildfire. In the event that fire spread beyond a targeted area (Figures 2.1 and 2.2), the burn boss and resource advisors onsite would determine if suppression actions are warranted.

Tools such as drip torches, fusees, All Terrain Vehicle ignition, aerial ignition, and other firing devices are typically used to ignite prescribed burns. Roads, natural barriers or landforms, and mechanically constructed fireline (less than 12 miles) would be utilized as fire breaks at the boundaries of burning units. Two track 4-wheel drive roads that are positioned along burn unit boundaries may be bladed to improve their ability to function as a control line. Broadcast burning operations would be monitored to ensure that project design elements are properly observed and objectives are achieved. Once treatment objectives are attained within targeted vegetation communities, no remaining acres within that community type would be treated within the burn units. All burn plans would include an escaped fire suppression plan and a smoke management plan. Use of petroleum products during ignition would be monitored to ensure that any spill was immediately contained and neutralized.

Broadcast Burning

Broadcast burning is a type of prescribed burning, where fire is intentionally ignited and allowed to spread over a large predetermined area within well-defined boundaries during specific environmental conditions in order to attain resource management and fuels reduction objectives. Broadcast burning would be the most broadly applied form of prescribed fire under the proposed action.

Portions of shrubland communities that are in the mid- to late juniper woodland transitional stages would require a mechanical pretreatment in order to generate heat sufficient to kill mature trees. Individual trees would be periodically felled against standing trees and allowed to cure in order to create a ladder that allows ground fire to move into the canopies of standing uncut trees. Sites that do not support large trees, and have a loss of shrub understory, typical of communities in the latter stages of juniper woodland development would not require any form of mechanical treatment prior to the application of prescribed fire. Other pretreatment activities that may occur within or near broadcast burn units include wetlining,[11] blacklining,[12] and handline construction around leave interior leave islands and fire-sensitive assets such as range improvements or cultural resources. Holding operations near property boundaries may be accomplished with pretreatment using small amounts of jackpot burning, conifer cutting, and/or piling and burning. Broadcast burns are generally implemented in the fall (September, October) to moderate undesirable fire behavior. Post-treatment, mixtures of native and nonnative grass, forb, and shrub seed would be applied to areas burned at a high severity within treatment units.

The scheduling of the burning during the 10-year implementation period is dependent upon weather, fuel conditions, project funding, and agreements with grazing permittees and cooperating landowners. Broadcast burning operations require one growing season of grazing rest prior to treatment and two growing seasons of rest following treatment. These factors, especially weather, make it difficult to accurately project the number of acres of burned in a given year.

[11] **Wetline:** A line of water, or water and chemical retardant, sprayed along the ground, which serves as a temporary control line from which to ignite or stop a low-intensity fire.

[12] **Blackline:** Preburning of fuels adjacent to a control line before igniting a prescribed burn. Blacklining is usually done in heavy fuels adjacent to a control line during periods of low fire danger to reduce heat on holding crews and lessen chances for spotting across control line.

Underburning

Figure 2.1 Example of low intensity forest underburn.

Underburning is the application of low intensity prescribed fire to surface fuels beneath a forested canopy. Burning is prescribed to reduce stocking density of small diameter (less than 8 inches in diameter) conifer trees and to reduce ground fuels (litter, twigs, branches <3 inches). Underburning would be applied primarily in the Bluebucket and Rudy treatment units subsequent to the completion of silvicultural thinning. It may be utilized occasionally in pine dominated woodlands located in the north-central portion of the Project Area.

The majority of the underburning would occur during the spring. Pretreatment of the burning areas in the fall could be necessary to reduce the risk of escapement during spring burning. The pretreatment would include activities such as establishing blacklines or constructing handline around the perimeter of leave islands or adjacent to burn unit boundaries. Underburning would be implemented as a primary activity under the Silvicultural Thinning for Hazardous Fuels Reduction Treatment. The Rudy and Bluebucket treatment areas and approximately 5,000 acres of pine forest or pine woodlands would be underburned under the proposed action.

Pile Burning

Mechanical piling and/or hand piling would be used to reduce fuel loading and continuity primarily in areas where conifers have been cut manually. Machine piles are usually 8 to 12 feet tall by 16 to 22 feet wide and would be constructed of previously cut pine and/or juniper by grapple equipped excavators in dry or frozen conditions. Hand piles are usually constructed of bucked up slash on ground where machine piles cannot be constructed due to excessive slope or other resource reasons. Hand piles are generally 3 to 5 feet tall by 3 to 5 feet wide. Pile burning would be implemented when soils are saturated or frozen and there is no potential for fire spread into adjacent plant communities. All piles would be burned within 2 years of construction.

Burning hand piles and machine piles would be an activity that would occur in the Rudy and Bluebucket treatment units under the Silvicultural Thinning for Hazardous Fuels Reduction Treatment. It would also possibly occur in other small scattered pine stands located in the north-central region of the Project Area. Pile burning may be utilized as a primary activity within the Mountain Big Sagebrush/Bunchgrass Restoration Treatment, the Big Game Browse Maintenance/Deciduous Vegetation Enhancement Treatment, and the Wyoming Big Sagebrush/Bunchgrass Restoration Treatment. Any rangelands impacted by a piling and burning activity would require application of a seed mix to provide competition against any introduced exotic species. Pile burning would be an activity that occurs on approximately 8,000 to 9,000 acres under the proposed action.

Figure 2.2 Results of an early season jackpot burning treatment.

Jackpot Burning

Jackpot burning is the application of prescribed fire to concentrations of fuels. Typically, it is applied during the time of year when the probability of fire spread is very low and in situations where fuels reduction is not a primary objective. Jackpot burning is the method used in units where residual activity created fuels or natural fuels are discontinuous. Jackpot burning would be implemented in the late fall, winter, or spring seasons (October to March) when soil and live fuel moistures are elevated and existing shrubs are more likely be maintained.

Jackpot burning would be the principal activity employed under the Low Sagebrush/Bunchgrass Habitat Enhancement Treatment and a primary option under the Big Game Browse Maintenance/Deciduous Vegetation Enhancement Treatment. to reduce the influence of conifers on wildlife habitat while retaining existing shrubs and herbaceous species. It may also be utilized as a primary activity within the Wyoming Sagebrush/Bunchgrass Restoration Treatment or as preparation for a broadcast burn. Jackpot burning may be utilized on approximately 8,000 to 9,000 acres within the Project Area.

Mechanical Thinning and Cutting

Variable density thinning would be the primary activity applied under the Silvicultural Thinning for Hazardous Fuels Reduction Treatment in the proposed action. Variable density thinning would primarily be applied to forestlands dominated by ponderosa pine under the proposed action. Variable density thinning involves a combination of commercial and noncommercial thinning techniques that results in retention of trees grouped in small dispersed patches with ladder fuels and crown fuels that are substantially reduced.

Commercial and/or noncommercial thinning may result in opportunities for biomass removal and utilization under stewardship contracts or small sales. Increasing attention toward biomass utilization is driven by environmental, social, and market considerations. The current primary and exploratory uses for biomass are in electricity generation, and conversion to a renewable fuel such as ethanol, bio-methane, and hydrogen.

Noncommercial Thinning

Noncommercial thinning involves manually cutting nonmerchantable trees (< 9-inch diameter) to reduce fuel laddering and/or help achieve specific resource objectives. Noncommercial thinning would be accomplished with chain saws or hand tools. The activity fuels generated by this activity would be piled or possibly burned as jackpots unless removed for biomass utilization.

Commercial Thinning

Commercial thinning removes merchantable (> 9-inch diameter) trees to reduce the fuels in a forested canopy that allow for the development of high intensity crown fires. It can also improve the health and growth rate of trees remaining in a stand following treatment.

Commercial harvest activities may be performed using ground-based equipment such as a mechanical harvesters, tractors, and rubber-tired skidders or via helicopter. Slash generated by the commercial harvest would be removed to a landing for disposal by burning or for biomass utilization if economically feasible. Otherwise, activity fuels generated by commercial harvest would be piled within treatments units for burning. Commercial thinning within the Project Area would be conducted under timber sales or under stewardship contracts.

Conifer Cutting – Fall and Leave or Lop and Scatter (No burning)

In some situations, conifers (most likely juniper and/or ponderosa pine trees) could be felled, lopped, and scattered under the proposed action. There would be no follow-up burning when this treatment is applied. A conifer cutting only treatment may be applied in mountain big sagebrush and low/stiff sagebrush communities that are in early stages of transition to juniper woodland or as a strategy to reduce juniper encroachment within stands of mountain mahogany or bitterbrush while maintaining existing shrubs.

It may also be applied to reduce the density of pine woodlands. This treatment would only be applied where risks associated with hazardous fuels are considered to be low.

Table 1.1 – Proposed Action Summary

Treatment Type	Prescribed Burning				Mechanical Treatment		Estimated Acres of Treatment
	Broadcast Burning	Under Burning	Pile Burning	Jackpot Burning	Conifer Cut Only	Pine/Fir Thinning	
Big Mountain Sagebrush/Bunchgrass Restoration	**1**		**1**	**2**			16,200
Low Sagebrush/Bunchgrass Habitat Enhancement				**1**	**2**		4,800
Wyoming Sagebrush/Bunchgrass Restoration			**1**	**1**	**2**		3,800
Big Game Browse Maintenance/Deciduous Vegetation Enhancement	**2***		**1**	**1**	**3**		3,500
Silvicultural Thinning for Fuels Reduction		**1**	**1**			**1**	5,000

* Broadcast burning would only be applied to stands of quaking aspen under this treatment option.

Activity Ranking

- 1 - A primary activity proposed under the treatment option in terms of acres treated.
- 2 - A secondary activity proposed under the treatment option in terms of acres treated.
- 3 - A tertiary activity proposed under the treatment option in terms of acres treated.

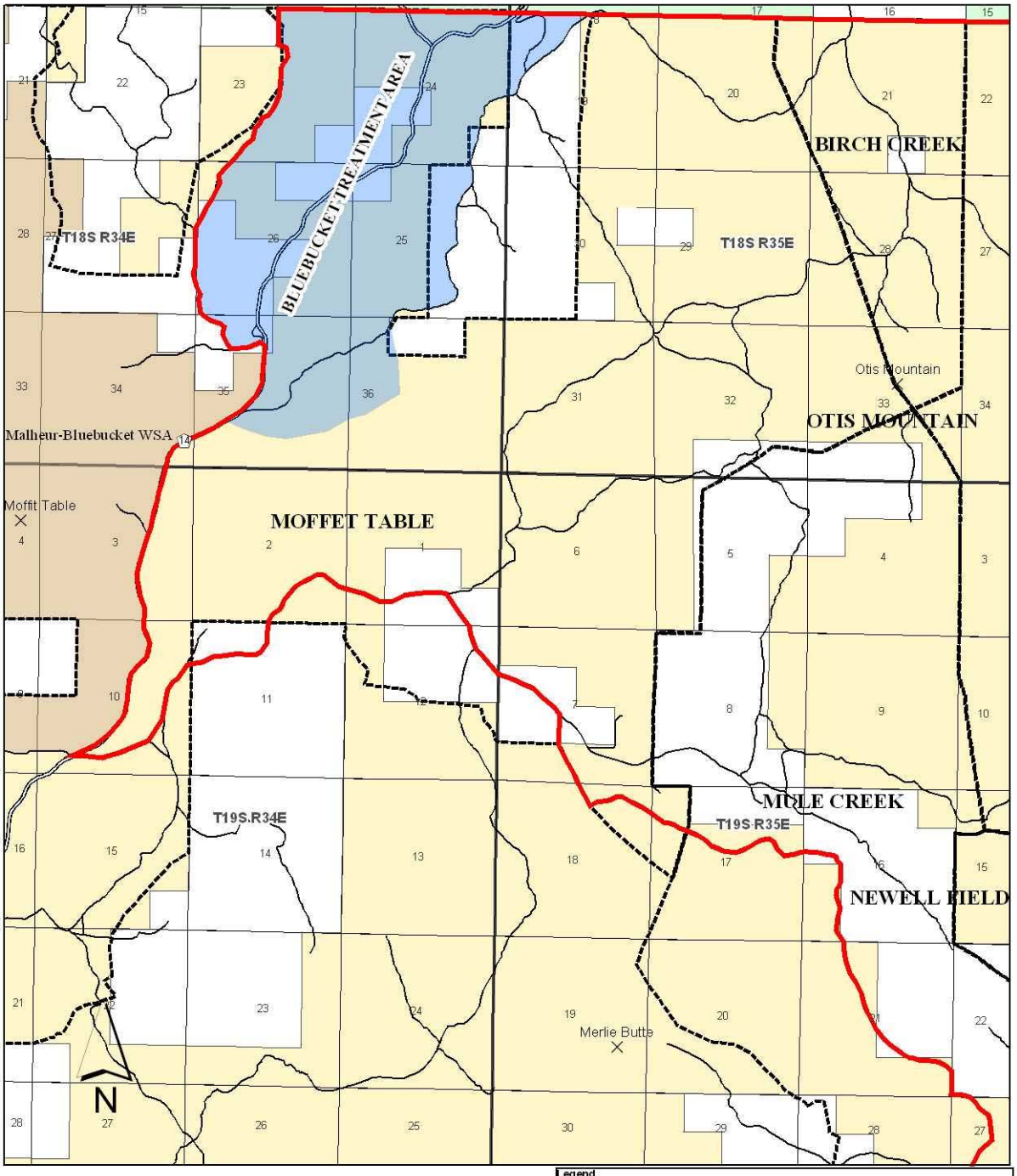

Figure 2.3 Otis Mountain / Moffet Table Project West Half Proposed Action Map

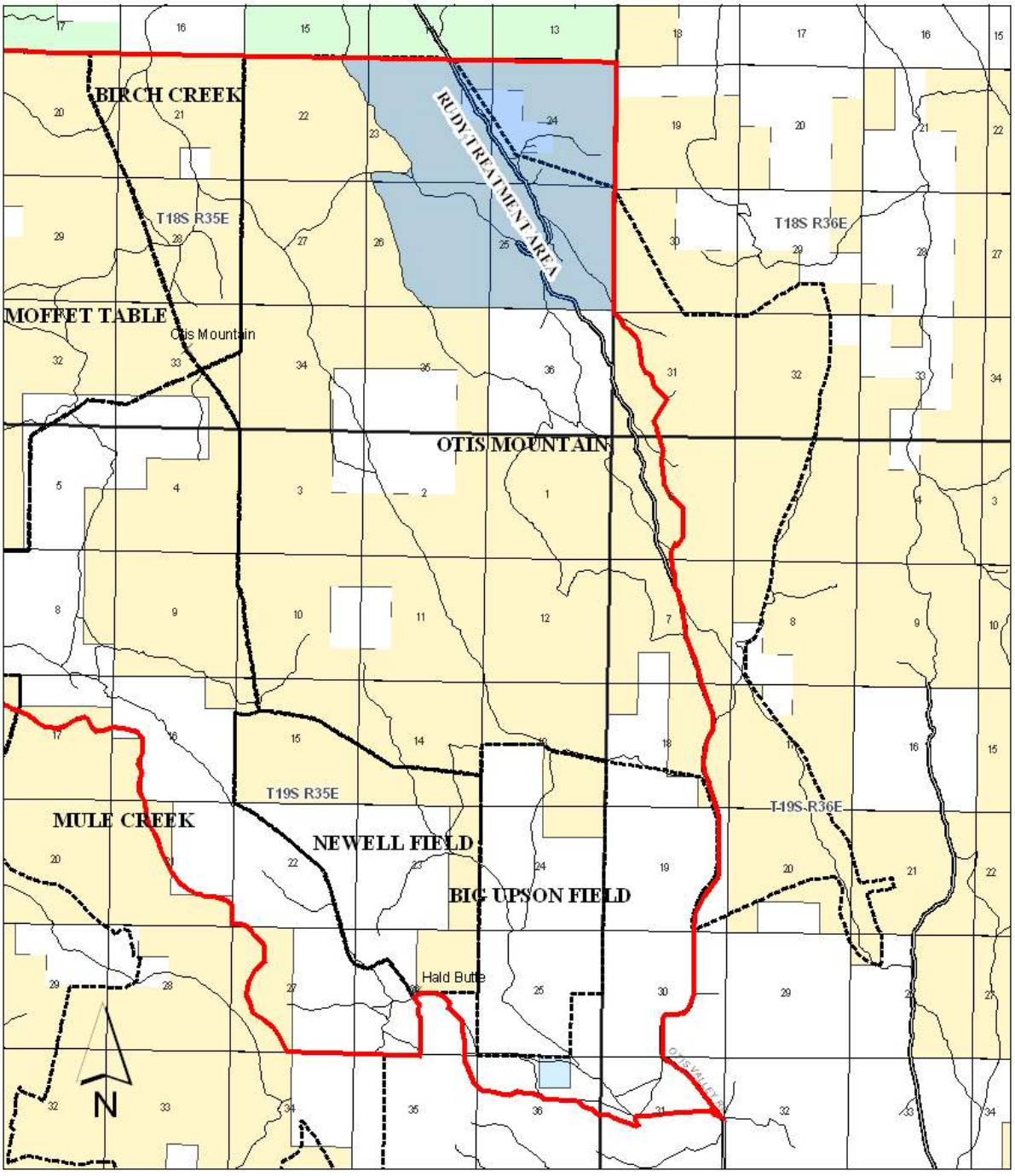

Figure 2.4 Otis Mountain / Moffet Table Project East Half Proposed Action Map

C. Project Design Elements

- Protect cultural resource values throughout the life of the project. Archaeological sites would be avoided within the mechanical treatment units and activity generated fuels would not be piled within the boundaries of sites. Sites with combustible constituents would be protected during the deployment of prescribed fire by blacklining resources and use of appropriate ignition techniques. The District Fuels Archaeologist would review burn plans prior to project implementation.

- Protect Special Status vegetation species throughout the life of the project. Special Status plant populations would be avoided within mechanical treatment units if necessary. Fire intolerant sensitive plants would be protected during deployment of prescribed fire by blacklining resources and use of appropriate ignition techniques. The District Fuels Botanist would review burn plans prior to project implementation.

- Protect Special Status wildlife species (fisheries and wildlife) habitat throughout the life of the project. Structures or areas with Special Status Species (SSS) habitat value identified during wildlife surveys would be protected during project implementation. The District Fuels Wildlife Biologist and/or the Three Rivers Fisheries Biologist would review burn plans prior to project implementation.

- Sites that lack sufficient understory species, such as fully-developed juniper woodlands, or areas that have burned at a high severity may require seeding following a prescribed fire treatment to attain the desired post-fire response. Mixtures of native and adapted grass, forb, and shrub seed may be applied to designated areas with aerial or ground-based methods. Candidate sites for seeding will be determined on a case-by-case basis as monitoring data is gathered.

- Livestock grazing would not occur for at least two growing seasons (or rested for a period that conforms with new standards for rangeland fire recovery) in pastures that have been treated with broadcast burning. An additional season of rest from grazing would be necessary prior to a broadcast burn to allow for the development of a fine fuel ignition source.

- Pastures that have been treated with a jackpot or pile burning treatment would be deferred or rested for at least one growing season following burning to allow for recovery of understory species. Pastures may be rested for up to two growing seasons (or for a period that conforms to any new standards for rangeland fire recovery) if recommended by a resource advisor.

- No downed ponderosa pine or fir logs greater than 15 inches diameter and no snags greater than 15 inches diameter at breast height (dbh) would be intentionally burned in any unit. Snags may be intentionally created if an area is determined to be snag deficient following mechanical and prescribed fire treatments.

- Maintain suitable big game hiding and thermal cover. Ensure that mountain mahogany stands and conifer leave islands continue to function as big game cover following treatments. Retain approximately 10 percent of expansion juniper and second growth pine within the Project Area to provide cover for mule deer and elk.

- Avoid manual cutting of all conifers with old growth characteristics or obvious wildlife occupation (cavities or nests). Consider protection of such trees during all prescribed fire operations.

- Invasive juniper would be treated within a 2-mile buffer around Greater sage-grouse leks. Treatment methods would be limited to cutting followed by jackpot burning or pile burning within the lek buffers. Treatments would not take place between March 1 and June 15.

- All ponderosa pine stumps greater than 14 inches diameter that are created during the project would be treated with Borax to guard against the threat of annosus (*Fomes annosus*) root disease.

- Reduce fuel buildups and overstocked stands in the Bluebucket Creek riparian area using only noncommercial thinning, jackpot burning, and hand pile burning. Hand piles would be located at least 50 feet from the Bluebucket Creek flood plain.

- In the Bluebucket Creek treatment area, existing downed large woody material (diameter > 6 inches) would not be intentionally burned in riparian areas. Cut conifers may be left in place for large wood recruitment into stream channel.

- Prior to treatment of prescribed fire and mechanical treatment units, noxious weed populations in the area will be inventoried. Weed populations identified in or adjacent to the Project Area will be treated in accordance with the Noxious Weed Management Program EA OR-020-98-05.

- Following all applications of prescribed fire, the areas will be monitored for noxious weed invasions (Appendix A, Otis Mountain/Moffet Table Vegetation Management Project Monitoring Plan). Weed populations that are identified in the Project Area will be treated in accordance with EA OR-020-98-05.

- All vehicles and equipment used during implementation would be cleaned prior to beginning work and at the close of activities to limit the spread of noxious weeds.

- Prescribed burning would follow the Oregon State Smoke Management Plan in order to protect air quality and reduce health and visibility impacts on designated areas.

- All burns would be planned based on either instructions given by, or in consultation with, the Oregon Department of Forestry and the State Implementation Plan for prescribed fires. Coordination with other prescribed fire projects occurring at the same time may be required.

- Dust generated in association with the commercial haul of wood products may require abatement. Abatement in the form of road watering would be dependent on the time of day and amount per day of haulage.

- Any temporary road constructed for commercial thinning would be closed immediately following the season of treatment. No constructed temporary roads would cross perennial or intermittent streams.

- Any road damaged by vehicles or equipment would be restored to its previous standard or higher, with special attention placed on installing and improving drainage on the road.

D. Alternatives Considered but Eliminated from Detailed Analysis

- **Prescribed Burning Only Alternative**

  An alternative that would use only prescribed fire to accomplish fuels management needs identified in the Project Area was considered but not developed for further analysis. Because forested stands in the Project Area are characterized by highly dense conditions that present a substantial risk for the escapement of prescribed fire, it was determined that mechanical thinning and fuels reduction activities would be required prior to treatment of the stands with prescribed fire. In juniper woodlands, monitoring of previous prescribed fire projects has indicated that broadcast burning in closed canopy conditions would not likely to meet the juniper mortality project objective without a mechanical pretreatment. Also, an only burning alternative may not allow for maintenance of big game browse shrub species or deciduous woody vegetation.

- **Herbicide Application for Juniper Control Alternative**

  In response to a public scoping comment, an alternative was considered that would use a pelletized herbicide to reduce the density of post-settlement western juniper on rangelands within the Project Area. This alternative was not developed and analyzed for the following reasons: 1) Chemical treatment of juniper stands would not meet project objectives that call for the reduction of hazardous fuels; 2) a chemical treatment would not meet the project objective for reintroducing fire to the Project Area; 3) a chemical treatment may not meet the project objective for western juniper mortality on certain soil types; and 4) concerns over possible impacts on water quality and plant species important for wildlife browse.

CHAPTER III: AFFECTED ENVIRONMENT

The Otis Mountain/Moffet Table Project Area is centered on Otis Mountain and is located on a variety of semi-arid, mid-elevation landforms. Typical landforms in the Project Area include drainage channels, stream flood plains, sideslope benches, dissected canyons, and rolling uplands. Project Area boundaries extend south to the rim at the northern edge of Merlie Table and west toward Moffet Table. A network of roads in the vicinity of Squaw Creek forms the eastern boundary of the Project Area while the Burns District boundary conforms with the northern edge of the Project Area perimeter. Elevations in the Project Area range between 4,200 to 5,700 feet above mean sea level. A general description of the existing environment for the Project Area can be found in the Three Rivers RMP/FEIS.

Affected environment summarizes the physical, biological, social, and economic environments of the Project Area. It also displays the analytical basis for comparison of the proposed action to the no action alternative presented in Chapter II.

Potential effects to the following critical elements of the human environment have been analyzed in the Three Rivers RMP/FEIS and will not be analyzed further in this document. These resource values include: Wilderness, Wilderness Study Areas, Areas of Critical Environmental Concern, Wild and Scenic Rivers, American Indian Religious Concerns, Paleontology, Flood Plains, Prime or Unique Farmlands, Special Status Species – Flora, and Hazardous Materials.

The following critical element is not discussed in the Three Rivers PRMP/FEIS:

Environmental Justice: Executive Order 12898 requires that Federal agencies adopt strategies to address environmental justice concerns within the context of agency operations. Implementation of the proposed action would not result in disproportionately high adverse human health or environmental effects on minority or low-income populations.

This section describes site-specific affected environmental components not adequately described in the Three Rivers RMP/FEIS. The discussion is separated into critical and noncritical elements.

The following critical elements are present and will be analyzed in the document: air quality, water quality/wetlands and riparian, migratory birds, SSS (fauna only), noxious weeds, cultural heritage, and American Indian traditional practices. Noncritical elements which are present and will be analyzed in this document are: soils, vegetation, wildlife, livestock grazing management, recreation, Visual Resource Management (VRM), social and economic values, fire management, forests and woodlands, and lands, realty, and roads.

A. Critical Elements

1. Air Quality

Air quality in the area associated with Otis Mountain/Moffet Table Fuels Management Project Area is generally good. No area or community in Harney County is considered a nonattainment area[13] for particulate matter meaning it is not in violation of national ambient air quality standards. The Strawberry Mountain Wilderness Area, an area designated as a Federal Class 1 airshed under the Clean Air Act (42 U.S.C. § 7475 (d)(2)(B)), is within approximately 22 air miles of the Project Area. Designation as a Class 1 airshed allows only very small increments of new pollution above existing air pollution levels.

Weather, as illustrated by wind, moves into the Project Area generally from the southwest or west and exits the Project Area to the northeast or east. Periods of degraded air quality can occur though typically these events are short-lived. These events are usually associated with development of a stable air mass and/or cold air inversion over the Project Area. The greatest occurrence of such phenomena is during the winter months and less so during the spring and fall (National Weather Service, personal communication, 2007). Smoke from wildfires and to a lesser degree prescribed fires are also a considerable source of degraded air quality when they occur, primarily from particulate matter contained in smoke. Smoke from wood burning stoves can cause periods of degraded air quality during the winter heating season, usually associated with the stable air and/or inversion phenomenon mentioned above.

2. Water Quality/Wetlands and Riparian

The Project Area is entirely within the Upper Malheur subbasin. Riparian conditions were analyzed at the 6th-field Hydrologic Unit Code (HUC)[14] or 6th level subwatershed. There are four 6th-level HUCs within the Project Area.

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[13] ***Non attainment Area:*** An area that does not meet one or more of the National Ambient Air Quality Standards for pollutants designated in the Clean Air Act.

[14] ***HUC - Hydrologic Unit Code:*** A hydrologic unit is a drainage area delineated to nest in a multi-level, hierarchical drainage system. Its boundaries are defined by hydrographic and topographic criteria that delineate an area drained by a river system, a reach of a river and its tributaries in that reach, a closed basin(s), or a group of streams forming a coastal drainage area.

Fire was common historically in the riparian zones of dry, low-severity fire regime forests of the Blue Mountains (Olson 2000).

Streams in the Project Area have been evaluated for water quality impairment as directed by the Oregon Department of Environmental Quality (ODEQ). Bluebucket Creek is on the ODEQ 303(d) list of water quality impaired streams for exceeding the 68 ºF water temperature standard for salmonid rearing. No other pollutants are documented in the streams within the Project Area. Below are brief descriptions of the current conditions of 6th level subwatersheds within the Project Area.

Bluebucket Creek 6th Field Hydrologic Unit Code

Bluebucket Creek is the only documented stream under BLM administration providing habitat for salmonid fish in this subwatershed. The creek runs for 7 miles across private and U.S. Forest Service (USFS) lands before entering the Project Area. Within the Project Area, BLM administration along Bluebucket Creek covers 1.5 miles divided into three sections bordered by private ownership. Downstream of the Project Area, Bluebucket Creek flows for an additional 1.8 miles before its confluence with the Malheur River.

Elevation along Bluebucket Creek within the Project Area ranges from 4,800 feet to 4,500 feet. This reach is hillslope constrained in a moderate V-shaped valley floor and has a 3 percent gradient. Dominant substrates are gravel and cobble with occasional boulders. Forest Service Road 14 parallels this section and limits the flood-prone width. The public land portion of this reach was rated in a 2005 Proper Functioning Conditioning (PFC) Assessment[15] as PFC. Surveyors noted that boulders and vegetation were adequate for dissipating energy; however, potential existed for more deep-rooted vegetation. Average stream shade in August of 2005 was 53 percent. Juniper has encroached into the riparian zone and the density of other conifers (Douglas-fir, ponderosa pine) has increased above historic conditions.

Bluebucket Creek is on the 303(d) list as water quality limited for exceeding the 68 ºF temperature standard. Bluebucket Creek is a tributary of the Middle Fork Malheur River, which is also listed as water quality limited for exceeding the 68 ºF temperature standard and for low dissolved oxygen levels (criteria: cool water).

The Bluebucket Treatment Area (Figure 1.2) is within this subwatershed.

[15] ***Proper Functioning Condition Assessment:*** A methodology for assessing the physical function of riparian and wetland areas. There are three main ratings; Proper Functioning Condition (PFC), Functioning at Risk upward or downward trend and nonfunctioning.

Griffin Creek 6th Field Hydrologic Unit Code

Approximately 35 percent of this subwatershed is within the Project Area. Oregon Department of Fish and Wildlife (ODFW) lists Griffin Creek as containing habitat for redband trout. The upper extent of distribution is unknown. The Project Area includes only the upper 5 miles of the creek, which is depicted as intermittent on the United States Geological Survey (USGS) 7.5-minute maps. Elevation along this section ranges from 5,540 to 4,380 feet.

Griffin Creek is a tributary to the Middle Fork Malheur River. The section of the Middle Fork Malheur River that Griffin Creek empties into is identified by the United States Fish and Wildlife Service (USFWS) as bull trout critical habitat (50 CFR Part 17). There is a 400-acre foot reservoir on Griffin Creek on private land between the Project Area and the Malheur River. This reservoir is used to irrigate approximately 300 acres.

The ODEQ does not list Griffin Creek as water quality limited.

Upper Otis Creek 6th Field Hydrologic Unit Code

The Project Area covers approximately 70 percent of this subwatershed. All streams on Burns District BLM-managed lands are depicted as intermittent or ephemeral on USGS topographic 7.5-minute maps (Cottonwood Reservoir and Otis Mountain). These streams are not known to be fish bearing and are not listed by ODEQ as water quality limited. No data have been collected by the BLM in this subwatershed within the Project Area boundary.

Cottonwood Reservoir 6th Field Hydrologic Unit Code

Approximately 20 percent of the subwatershed is within the Project Area and almost all of the Rudy Treatment Area (Proposed Action) is within this subwatershed.

The headwaters and 4.8 miles of Squaw Creek are within the Project Area. This 4.8-mile section is an interrupted stream segment where 2 miles are perennial and 2.8 miles are intermittent to ephemeral. Downstream of the Project Area, Squaw Creek flows for an additional 3.2 miles. This 3.2-mile section is perennial.

Squaw Creek has a moderate to steep gradient (5 to 9 percent) and is confined within a narrow canyon. While Squaw Creek is not fish bearing, it is a tributary to Cottonwood Creek which contains habitat for redband trout.

Squaw Creek is not listed by ODEQ as water quality limited.

3. Migratory Birds

The Project Area has a variety of plant communities, and thus offers quality habitat for numerous migratory bird species. Migratory bird species strongly associated with the following habitats are likely to occur or have the potential to occur in the Project Area: ponderosa pine woodlands, ponderosa pine/juniper woodlands, juniper woodlands, big sagebrush/bunchgrass communities, and low and stiff sagebrush plant communities. Small isolated stands of mountain mahogany and aspen also occur within the Project Area adding to the habitat diversity within the Project Area. There are a few migratory bird species of conservation concern for the Great Basin that either occur or potential habitat for that species exists within the Project Area. These species include golden eagle, flammulated owl, Lewis's woodpecker, Williamson's sapsucker, white-headed woodpecker, loggerhead shrike, Brewer's sparrow, and sage sparrow. All of these species except for golden eagles are Burns District SSS and will be addressed in the SSS section. Golden eagles use a variety of habitats, and generally nest on ledges along rims, but may nest in large mature coniferous trees. There are no known golden eagle nest sites within or near the Project Area. There are many other migratory bird species that are not of conservation concern for the Great Basin Region that use the Project Area for nesting, foraging, and resting.

4. Special Status Species (Fisheries and Wildlife)

Fisheries

Downstream of the Project Area, Bluebucket Creek empties into the Middle Fork Malheur River. This section of the Malheur River is identified by the USFWS as bull trout (*Salvelinus confluentus*) migration, over-wintering, and foraging habitat (USFWS 2002). Bull trout require very cold, pristine streams and are listed as a Threatened Species under the Endangered Species Act. Upstream of the Bluebucket Creek confluence with the Middle Fork Malheur River has bull trout populations utilizing spawning and rearing habitat in the upper headwaters and that migrate downstream, at least as far as Bluebucket Creek (Malheur Basin Action Plan 1999). Bull trout use in the Malheur River below Bluebucket Creek is limited; however, one radio-tagged fish was located at the mouth of Wolf Creek (approximately 7 miles downstream from Bluebucket Creek) in April 2002 (Schwabe and Perkins 2003).

Great Basin redband trout (*Oncorhynchus mykiss ssp*.), a Bureau tracking species in Oregon, are found in Bluebucket Creek. This species prefers cold, clear, fast-flowing water with clean cobbles and gravels. These trout are adapted to the dry, hot summers of eastern Oregon and can withstand short periods of time at peak water temperatures of 75 to 80 °F, which would be lethal to most other trout (Bowers et al. 1979).

Other fish likely to occur in or downstream of the Project Area include brook trout (*Salvelinus fontinalis*), mountain whitefish (*Prosopium williamsoni*), speckled dace (*Rhinichthys osculus*), longnose dace (*R. cataractae)*, redside shiner (*Richardsonius balteatus*), and sculpin (*Cottus spp*.). Effects on these species would be the same as effects to SSS and are not separately analyzed in this document.

Terrestrial and Avian Wildlife

There are no known Federally listed Threatened or Endangered wildlife species found within or adjacent to the Project Area. There are several SSS that either occur or have the potential to occur as their habitat exists within the Project Area. These species include Greater sage-grouse (*Centrocercus urophasianus)*, northern goshawk (*Accipitor gentilis*), flammulated owl (*Otus flammeolus*), northern pygmy owl (*Glaucidium californicum*), pileated woodpecker (*Dryocopus pileatus*), Lewis's woodpecker (*Melanerpes lewis*), Williamson's sapsucker (*Sphyrapicus thyroideus*), white-headed woodpecker (*Picoides albolarvatus*), pygmy nuthatch (*Sitta pygmaea*), olive-sided flycatcher (*Contopus cooperi*), loggerhead shrike (*Lanius ludovicianus*), Brewer's sparrow (*Spizella breweri*), sage sparrow (*Amphispiza belli*), and several species of bats. Other SSS may occasionally occur within the Project Area, but their occurrence would be considered rare or infrequent.

The Project Area is considered to be habitat or potential habitat for Greater sage-grouse, an Oregon BLM sensitive wildlife species. Greater sage-grouse have been documented in the Project Area. Greater sage-grouse are considered to be sagebrush obligates, relying on the plant for food and cover throughout the year. The species may require an extensive home range with specific sagebrush habitat types required for mating, lekking, nesting, brood rearing, and wintering. Sage-grouse populations demonstrate seasonality in the use of those habitats, with specific areas that are used as mating/lekking habitat, nesting habitat, brood-rearing habitat and wintering habitat.

Sage-grouse lek in open areas near sagebrush dominated plant communities. There is one known lek within the Project Area. The Birch Creek #1 lek occurs on private land on the southeast portion of the Project Area. There are several other active leks that occur within 2 miles of the Project Area. The Birch Creek #2 lek occurs just to the east of the Project Area. The Moffet Table lek is located just to the west of the Project Area, and the Merlie Table Complex of three leks occurs just to the south of the Project Area.

Sage-grouse generally use big sagebrush for nesting habitat, although some have been known to nest in low sagebrush and other habitats. For the brood-rearing stage and prenesting period for hens, areas that are rich in forbs are important.

The low and stiff sagebrush flats within the Project Area could be optimal foraging areas during these stages as they generally are rich in forbs. In winter sage-grouse congregate in areas where sagebrush is available above the snow or on windswept ridges. By late fall, sagebrush is almost exclusively the only item in the diet and remains so until spring.

The mountain big sagebrush communities in the Project Area have potential to provide quality wintering habitat as snow depth rarely covers the plants. Approximately 15 percent of the Project Area, all on the southwestern portion of the Project Area, is classified as wintering habitat. Another 30 percent is classified as probable habitat context unknown. Approximately 30 percent of the Project Area is considered to be historical habitat, but currently unsuitable due to juniper encroachment. These are areas where mountain big sagebrush/bunchgrass communities and low sagebrush flats have been encroached upon and outcompeted by western juniper. Today these areas would be classified as juniper woodlands or in a mid- to late transitional stage toward juniper woodlands. In addition, much of the area that falls under the broad classifications of probable habitat context unknown is experiencing juniper and ponderosa pine encroachment as well. These areas that are experiencing juniper or pine encroachment are already, or will be, considered historical habitat, but currently unsuitable for sage-grouse, if nothing is done to control the encroaching juniper and pine. Another roughly 10 percent of the Project Area is considered historical habitat, but currently unsuitable due to wildfires or prescribed burns. Areas considered unsuitable due to prescribed or wildfire may still be providing quality foraging habitat as these areas are often rich in forbs. The remainder of the Project Area (approximately 15 percent) is considered nonhabitat for sage-grouse. This classification generally applies to all of the forested areas within the Project Area.

In July of 2006, inventories for northern goshawks were conducted on approximately half of the potential habitat occurring in the Project Area. One pair of goshawks was observed in the northwest corner of the current Project Area, but no active nest sites were discovered. Additional northern goshawk inventories will be performed throughout the Project Area in 2007 and 2008.

The flammulated owl, northern pygmy owl, pileated woodpecker, Lewis's woodpecker, Williamson's sapsucker, white-headed woodpecker, and pygmy nuthatch are forested species that have not been documented in the Project Area, but are either expected to occur or potential habitat for these species occurs. These species are cavity nesters that primarily rely upon large dead and dying trees for nesting. The flammulated owl, northern pygmy owl, and pileated woodpecker prefer closed canopies, while the Lewis's woodpecker, Williamson's sapsucker, white-headed woodpecker, and pygmy nuthatch prefer more open canopies. All generally prefer a more open understory.

The olive-sided flycatcher prefers open forest with an uneven canopy. Tall prominent trees and snags, which serve as foraging and singing perches, are common features of nesting habitat.

Brewer's sparrow, sage sparrow, and loggerhead shrike, all of which are Birds of Conservation Concern for the Great Basin Region, are expected to inhabit the Project Area. These species nest in habitats with varying degrees of sagebrush density. Habitat quality in the Project Area for these species has been degraded by juniper encroachment, and in some cases, ponderosa pine.

Several Special Status bat species may also be found within the Project Area. The bat species typically found in forested habitats primarily depend upon large dead or dying trees for roosting.

5. Noxious Weeds

There are seven recorded noxious weed sites in the Otis Mountain/Moffet Table Project Area. There have been no large-scale weed inventories conducted in the Project Area; however, there have been a number of inventories conducted recently in association with small-scale vegetation management projects within the Project Area. Recorded noxious weed sites within the Project Area include four sites of bull thistle (*Cirsium vulgare)* (5 acres), one site of Dalmatian toadflax (*Linaria dalmatica)* (.08-acre), one site of diffuse knapweed (*Centaurea diffusa*) (.006-acre), and one site of Mediterranean sage (*Salvia aethiopis*) (.05-acre).

There are also several known noxious weed sites in close proximity to the Project Area. Species include Canada thistle, bull thistle, whitetop, diffuse knapweed, Mediterranean sage, and dalmatian toadflax. They occur primarily along roads and are being treated on a regular basis.

There are approximately 3,500 acres of fuels management projects that have been completed on public and private lands within the current Project Area. They include 700 acres of pine thinning and piling; 700 acres of juniper cut and leave treatment; and 1,600 acres of juniper and shrubs that have been broadcast burned between 2000 and 2002. Approximately 500 acres of juniper cutting and pine thinning treatments have been completed on privately owned lands within the Project Area. Previously treated areas present more risk for noxious weed establishment due to increased ground disturbance. Treated areas on public land and are being monitored closely.

Frequently traveled roads form the eastern and western boundaries of the Project Area. Roads are a continual source of new weed introductions and must be monitored regularly to ensure early detection of new weed populations. If found, any new weed sites would be treated promptly to minimize spread.

6. Cultural Heritage

The archaeological record suggests that the uplands within the Otis Mountain/Moffet Table Project Area were incorporated into prehistoric land-use practices that are generally characterized by broad spectrum foraging strategies (Binford 1980). Hunter-gatherers operating in the area are generally thought to have been in small highly mobile groups carrying light and flexible toolkits through most of the Holocene (less than 10,000 years Before Present (BP)). Based on the typological cross-dating of projectile points observed in archaeological assemblages, it is estimated that cultural activities have occurred in the Project Area for at least the last 10,000 years (Wilde 1985), and were possibly most intensive during a period probably reached their peak around 4000 to 1000 years BP. Hot-dry forests and woodlands of the Blue Mountains were most likely intentionally burned on a regular basis by hunter-gatherers in the prehistoric and early historic periods (Agee 1994; Barrett 1980).

In the ethnographic and early historic periods, the Harney Valley Paiute, or *Wada Tika*, who wintered near Burns, Oregon, was the primary group utilizing the Project Area (Couture 1986). The Malheur River and its tributaries played a prominent role within the seasonally cyclic subsistence-settlement patterns of the Harney Valley Paiute (Couture 1986). In the late spring, families and small groups would travel from root gathering grounds west of Drewsey up the Malheur River toward the Strawberry Mountains to harvest Chinook salmon and steelhead. In the summer and early fall months, bands of Paiute moved along the river corridor and adjacent uplands with men in pursuit of big game, while women gathered and processed chokecherry (Couture et al. 1986). The Project Area is situated entirely within the former Malheur Indian Reservation which was set-aside for the Harney Valley Paiute in 1872 by executive order. Several Harney Valley Paiute continued to live along the banks of the Malheur River and practice traditional hunting, fishing, and gathering activities.

Following the decline of the eastern Oregon gold rush in the late 19th century, the principal land use in the southern Blue Mountains was livestock grazing. Development of homesteads and small-scale stock raising operations accelerated after the Malheur Indian Reservation was seized by the Federal government and placed in public domain in 1883. At this time, a rough cow town that may have been called "Gouge-Eye" was founded on the Malheur River and early homestead claims filed in the area included William Robbins in Drewsey Valley, Joseph Lamb on Stinkingwater Creek, and Tom Howard on Mule Creek. The name of the community was changed to Drewsey in 1884 when a post office was established on the townsite to serve about 60 homesteaders and their families (Brimlow 1980). A number of Harney Valley Paiute were also living near Drewsey in the late 19th century. Paiute living in the Drewsey area worked at local shops and stores to supplement resources obtained by their families through the practice of traditional hunting and gathering along the Malheur River (Metschan 1947).

The most frequently occurring type of cultural resource in the Project Area is lithic dominated archaeological sites, known as "lithic scatters." Such deposits are the archaeological signature of precontact era hunter-gatherer occupations that can span several thousand years. Lithic scatters typically include obsidian, chert, and basalt artifacts and are often visible at the surface of the ground.

The scientific research value of obsidian dominated surfacial lithic scatters can be degraded by intense surface temperatures such as those generated by wildland fire events (Skinner et al. 1997; Linderman 1992). There are 10 cultural resource properties documented in the Otis Mountain/Moffet Table Project Area that display a precontact period lithic dominated components. Sites of this type in the Project Area range between .1 and 11 acres in size and several display potential for patterned subsurface components.

Post-contact era cultural resource properties may include standing buildings; and/or archaeological features such as foundations or structural ruins, privy pits, refuse dumps, and blazed trees. Sites with historic components in the Project Area are most likely associated with late 19th and early 20th century cattle ranching and/or homesteading activities. There are two cultural resource properties that have been identified within the Project Area that display a historic period component. Post-contact era cultural resource properties in the Otis Mountain/Moffet Table Project Area range between 1.1 and 3.7 acres in size.

There are just under 25,000 acres within the Otis Mountain/Moffet Table Project Area that are considered "High Probability" for the occurrence of cultural resources. Several cultural resource properties documented in the vicinity of the Project Area contain or are adjacent to accumulations of hazardous fuels. Prior to project implementation, a Class II cultural resource inventory[16] and consultation of the Burns Paiute Indian Tribe would be required to comply with the terms of the Protocol for Managing Cultural Resources on Lands Administered by the BLM in Oregon. The Protocol describes how the BLM and the Oregon State Historic Preservation Office will cooperate under a National Programmatic Agreement to meet the requirements of Section 106 of the National Historic Preservation Act.

7. American Indian Traditional Practices

The Otis Mountain/Moffet Table Project Area lies within the traditional territory of the Burns Paiute (or *Wada Tika*) Tribe of the Northern Paiute Indians.

[16] **Class II Cultural Resource Inventory:** A sample based field survey designed to characterize the density, diversity, and distribution of cultural resource properties in an area of potential effect.

It also is entirely within the former Malheur Indian Reservation. The Burns Paiute Tribe was Federally recognized in 1972. The National Environmental Policy Act, and other authorities, requires that Federal agencies consider the impact of their actions on cultural uses of the natural environment such as those practiced by present-day communities of American Indians. The BLM and the Burns Paiute Tribe signed a Memorandum of Understanding in 2001 that outlines a means for consultation and coordination between the BLM and the Tribe during the environmental planning process.

Resources of contemporary tribal interest may include traditional cultural properties (National Park Service 1990), areas important for the practice of Indian religion, Indian sacred sites on Federal lands, and areas that support cultural uses of the natural environment (i.e., subsistence use of plants or animals). Presently, consultation with the Burns Paiute Tribe has not resulted in the identification of any specific places within the Otis Mountain/Moffet Table Project Area that have been determined to be important for traditional Indian land-uses. The Tribe has, however, expressed a concern regarding the population and distribution of culturally important plant species on all parts of the Three Rivers Resource Area during previous consultation. Streambottoms along Bluebucket Creek, Birch Creek, Otis Creek, and Squaw Creek provide habitat suitable for hardwood shrubs of interest to the Tribe such as chokecherry, willow, alder, and quaking aspen. Upland areas with thin and rocky soils may support key edible species such as bitterroot or biscuitroot.

B. Noncritical Elements

1. Soils

Soils in the Project Area can be grouped into one of three general map units. The three primary soil map units in the Project Area are composed of Merlin-Observation-Lambring, Gamble-Risley-Mahoon, and Gaib-Anatone-Royst series.

The Gumble-Risley-Mahoon series are composed of shallow to moderately deep well-drained soils formed on diatomaceous earth, tuff, altered andesite, shale, or sandstone. The soils range from 14 to 40 inches in depth and have low to moderate potential for surface erosion (Soil Survey Staff, National Resources Conservation Service [NRCS] 2004). These soil series are dominant in the lower to middle elevational shrublands in the Project Area.

The Merlin-Observation-Lambring series are characterized by shallow to very deep well-drained soils formed on weathering basalt, andesite, tuff, and gravity deposited volcanic material. The soils range in depth from 18 to 40 inches in depth and have low to moderate potential for surface erosion (Soil Survey Staff, NRCS 2004). This soil series is dominant in the middle elevational shrublands.

The Gaib-Anatone-Royst series consists of shallow to moderately deep well-drained soils formed on loess, volcanic ash, and weathering basalt, andesite, and tuff. Soils range from 13 to 36 inches in depth and have low to moderate potential for surface erosion (NRCS 2004). This soil series is dominant in the higher elevational ponderosa pine forest-forest fringe environments.

Soils in the Project Area are becoming increasingly vulnerable to surface erosion as understory vegetation beneath the canopies of western juniper stands is replaced by bare ground (Bates et al. 1998; Miller et al. 1994). Unvegetated soil surfaces are especially at risk of erosion during high intensity convective storms and during periods when soil is frozen.

2. Vegetation

Vegetation within the Otis Mountain/Moffet Table Project Area primarily consists of ponderosa pine forest and woodlands above 5,000 feet elevation, mountain big sagebrush/bunchgrass and low sagebrush/bunchgrass communities between 5,000 and 4,000 feet elevation, and a Wyoming big sagebrush dominated plant community at lower elevations. Riparian vegetation and isolated stands of upland aspen are also present. Vegetation within the Project Area is influenced by western juniper encroachment by various degrees (Table 3-1).

Shrubland plant communities within the Otis Mountain, Moffet Table/Birch Creek, Newell Field/Big Upson Field, and Mule Creek Allotments are summarized below. Riparian vegetation is described in Section A-3, Wetlands and Riparian/Water Quality.

Table 3-1. Characteristics of Post-Settlement Stands of Western Juniper (Miller et al. 2000)

Post Settlement Stands Characteristics	Early	Mid	Late
Tree Canopy	Open, actively expanding, cover ≤ 5%	Actively expanding, cover 6 to 20%	Canopy expansion greatly reduced, cover 21 to 35%
Leader Growth (Dominant Trees)	Good terminal and lateral leader growth	Good terminal and lateral growth	Good terminal growth, reduced lateral growth
Crown Lift (Dominant Trees)	Absent	Absent	Lower limbs beginning to die where tree canopy > 35%
Potential Berry Production	Low	Moderate to High	Low to Moderate
Tree Recruitment	Active	Active	Reduced, limited primarily to beneath trees
Leader Growth (Understory Trees)	Good terminal and lateral leader growth	Good terminal and lateral growth	Greatly reduced terminal and lateral growth; reduced ring growth
Shrub Layer	Intact	Nearly intact to showing mortality around dominant trees	≥ 40% dead

Otis Mountain Allotment

The western two-thirds of the Otis Mountain Allotment covers approximately 11,277 acres and supports a combination of mountain big sagebrush/bunchgrass, low or stiff sagebrush/bunchgrass, Wyoming big sagebrush/bunchgrass, and ponderosa pine forest plant communities.

Approximately 55 percent of the area is characterized as a mountain big sagebrush/bunchgrass plant community. It is estimated that 70 percent of the mountain big sagebrush communities in these allotments are in the latter stages of succession toward juniper woodland (Table 3-1). Roughly 18 percent of the area is classified as low or stiff sagebrush/bunchgrass plant community in the early stages of conversion to juniper woodlands. Understory bunchgrass species present in both plant communities include Idaho fescue, bluebunch wheatgrass, and Sandberg's bluegrass.

A small portion of the area (less than 2 percent) is characterized by Wyoming big sagebrush with an understory of perennial bunchgrasses or cheatgrass (*Bromus tectorum*). Stands of Wyoming big sagebrush within the Otis Mountain Allotment are in an early stage of transition to juniper woodland.

The remaining 25 percent of the Otis Mountain Allotment is situated above an elevation of 4,500 feet and is dominated by ponderosa pine and mixed conifer forest or pine woodland communities. Understory species that generally occur with mixed conifer forests and pine woodlands include mountain big sagebrush, bluebunch wheatgrass, and Idaho fescue. See Section B-10 for a complete description of existing conditions in forests and pine woodlands.

Mountain mahogany and bitterbrush shrubs occur throughout the communities in small stands and as individual shrubs. In many cases, mahogany and bitterbrush shrubs are decadent with a substantial dead component. Competition from western juniper and ponderosa pine for light and water is contributing to the decline of both species.

Three prescribed burns in the Otis Mountain Allotment portion of the Project Area have moved approximately 318 acres from fully-developed juniper woodland communities to mountain big sagebrush/bunchgrass, mountain mahogany, riparian, and aspen dominated communities in the early stages of juniper woodland conversion. Seven hundred acres of precommercial thinning, completed for fuels reduction purposes, has been completed in the mixed conifer forest near the northeast corner of the allotment. All rangeland restoration and fuels reduction treatments were completed in the allotment between 2000 and 2005.

Moffet Table and Birch Creek Allotments

The Moffet Table and Birch Creek Allotments cover an area of approximately 11,779 acres within the Project Area and are a combination of mountain big sagebrush/bunchgrass, low or stiff sagebrush/bunchgrass, and ponderosa pine/mixed conifer woodland and forested plant communities.

Approximately 50 percent of the area is characterized as a mountain big sagebrush/bunchgrass plant community. It is estimated that 50 percent of the mountain big sagebrush communities in these allotments are in the latter stages of succession toward juniper woodland (Table 3-1). Roughly 30 percent of shrubland communities in the Moffet Table-Birch Creek area are classed as low sagebrush/bunchgrass plant community in the early stages of conversion to juniper woodlands. Understory bunchgrass species present in both plant communities include Idaho fescue, bluebunch wheatgrass, and Sandberg's bluegrass.

The remaining 20 percent of the Otis Mountain Allotment is situated above an elevation of 4,500 feet and is dominated by ponderosa pine and mixed conifer forest or pine woodland communities. Understory species that generally occur with mixed conifer forests and pine woodlands include mountain big sagebrush, bluebunch wheatgrass, and Idaho fescue. See Section B-10 for a complete description of existing conditions in forests and woodlands.

Mountain mahogany and bitterbrush shrubs are distributed through mountain big sagebrush, low sagebrush, forest, and pine woodland communities in a manner that is similar to the Otis Mountain portion of the Project Area. Juniper encroachment is contributing to the decline of both species in the Moffet Table and Birch Creek Allotments.

Nine juniper cuts in the Moffet Table and Birch Creek Allotments have moved approximately 680 acres from fully-developed juniper woodland communities to mountain big sagebrush/bunchgrass, mountain mahogany, riparian, aspen dominated communities in the early stages of juniper woodland conversion. Three prescribed burns in the Moffet Table and Birch Creek portion of the Project Area have moved approximately 1,270 acres from fully-developed juniper woodland to early seral shrubland with a mosaic of grassy openings. The treatments were completed between 2000 and 2003.

Approximately 500 acres of juniper cutting is being completed on private lands east of Bluebucket Creek.

Mule Creek Allotment

The northern half of Mule Creek Allotment accounts for approximately 4,735 acres within the Project Area and is characterized by a combination of mountain big sagebrush/bunchgrass, low sagebrush/bunchgrass, and Wyoming big sagebrush plant communities.

Approximately 76 percent of the area supports a mountain big sagebrush/bunchgrass plant community. It is estimated that 50 percent of the mountain big sagebrush communities in the allotment is in the latter stages of succession toward juniper woodland (Table 3-1). Roughly 12 percent of the area is classified as low sagebrush/bunchgrass plant community in the early stages of conversion to juniper woodlands. Understory bunchgrass species present in both plant communities include Idaho fescue, bluebunch wheatgrass, and Sandberg's bluegrass.

Roughly 12 percent of the allotment lies below an elevation of 4,500 feet and is dominated by Wyoming big sagebrush with an understory of perennial bunchgrasses and exotic annual grasses. Wyoming big sagebrush communities in the allotment are in the early stages of conversion to juniper woodland.

Sparse amounts of mountain mahogany and bitterbrush shrubs are distributed throughout the communities in small stands and as individual shrubs. In many cases, mahogany and bitterbrush shrubs are decadent with a substantial dead component. Competition from western juniper for light and water is contributing to the decline of both species.

There has been no mechanical or prescribed fire treatments conducted on BLM-administered lands within the Mule Creek Allotment portion of the Project Area over the past 20 years. Approximately 1,000 acres of juniper cutting completed on private lands within the past 5 years has fully-developed juniper woodland communities to mountain big sagebrush/bunchgrass community in the early stages of juniper woodland conversion.

Newell Field and Big Upson Field

The southeastern corner of the Project Area is comprised of approximately 5,007 acres within Newell Field, Big Upson Field, and a vacant private grazing allotment. Plant communities represented in this portion of the area include Wyoming big sagebrush, mountain big sagebrush/bunchgrass, and low or stiff sagebrush/bunchgrass types. Low elevation drainage bottoms and dry basins in the Project Area support basin big sagebrush, Great Basin wildrye, bluebunch wheatgrass, and needleandthread grass.

Approximately 60 percent of the area supports a Wyoming big sagebrush dominated plant community. The understories in stands of Wyoming big sagebrush in the area contain Sandberg's bluegrass and exotic annual species. Wyoming big sagebrush communities in this portion of the Project Area are in the early to mid-stages of juniper woodland encroachment (Table 3-1).

An estimated 32 percent of the area supports a mountain big sagebrush/bunchgrass plant community. Understory bunchgrass species associated with mountain big sagebrush in the allotment includes Idaho fescue, bluebunch wheatgrass, and Sandberg's bluegrass. It is estimated that 10 percent of the mountain big sagebrush communities in the allotment is in the latter stages of succession toward juniper woodland (Table 3-1).

A small portion of the area (less than 8 percent) supports basin big sagebrush dominated shrublands or perennial grasslands. The basin big sagebrush communities include understories of Great Basin wildrye, bluebunch, wheatgrass, and needleandthread grass. The low elevation grassland community is dominated by Great Basin wildrye. This portion of the Project Area is considered to be in the early stages of succession to juniper woodland (Table 3-1).

There has been no mechanical or prescribed fire treatments conducted within the Mule Creek Allotment portion of the Project Area over the past 20 years.

3. Wildlife

Wildlife in addition to migratory birds and SSS occurring in the Project Area include mule deer (*Odocoileus hemionus*), Rocky Mountain elk (*Cervus elaphus*), pronghorn antelope (*Antilocapra americana*), badger (*Taxidea taxus)*, black-tailed jackrabbit (*Lepus californicus*), cottontails (*Sylvilagus spp.)*, cougar (*Puma concolor)*, bobcat (*Felis rufus)*, coyote (*Canis latrans)*, reptiles and amphibians, many other bird species, and a myriad of small mammal species. Only the big game species will be covered in depth in this section. The Project Area falls almost entirely within the ODFW Malheur River Hunt Unit for all big game species. The easternmost portion of the Project Area falls within the ODFW Beulah Hunt Unit.

Pronghorn antelope can be found throughout the nonforested and woodland portions of the Project Area. However, they prefer more open habitats such as the low and stiff sagebrush flats and generally open rolling terrain.

Mule deer and Rocky Mountain elk use the Project Area yearlong. None of the Project Area is classified as deer winter range. However, wintering deer frequently use south facing slopes and open ridgetops in lower elevations of the Project Area. Deer are largely dependent on sagebrush for their winter diet. Bitterbrush and other shrubs are also important browse species that deer forage on in the fall and winter.

Approximately 75 percent of the Project Area is classified as elk winter range. The Project Area offers quality forest fringe habitat which provides great wintering habitat for elk. Winter range for both deer and elk is being degraded across the Project Area as juniper and ponderosa pine encroachment continues to take place upon important plant communities. Much of the winter range within the Project Area does not currently support browse. These are areas where juniper and/or pine have encroached upon and outcompeted these key forage species. These areas now provide cover but no longer provide browse. In several other portions of the Project Area, juniper is in an intermediate transitional stage toward woodlands. In these areas browse species are declining in quantity, health and vigor, and palatability. There are a few other areas within the Project Area where browse species are healthy and plentiful. These areas offer winter forage for both wintering deer and elk.

Overall the Project Area has a relatively small percentage (< 15 percent) of winter range that is currently not being degraded by juniper and/or pine encroachment. There is an abundance of thermal and hiding cover within the Project Area. Juniper, forested sites, and big sagebrush are the major cover types used for hiding and thermal cover during the winter months to help animals reduce heat loss during cold winter nights. Mountain mahogany and aspen stands also serve as hiding or thermal cover, but they occur on a less frequent basis.

4. Livestock Grazing Management

Moffet Table (#5511), Mule Creek (#5515), Birch Creek (#5516), and Otis Mountain (#5517) Allotments are the principal grazing allotments within the Project Area.

Moffet Table Allotment is generally grazed from May 1 to September 15 annually (Although on/off dates can vary up to 2 weeks depending on conditions). There are six pastures within this allotment which are used by five authorized grazing permittees. Cattle begin grazing on the lower elevation pastures under an early/graze treatment and move up in elevation through the pastures until they reach the Otis Mountain Pasture on July 15. Otis Mountain Pasture is grazed from July 15 to September 15 every year under a deferred grazing treatment. Exceptions are Battle Mountain Pasture which is grazed during the month of May every year, Bluebucket Pasture which is grazed for the month of May every other year to address riparian concerns along Bluebucket Creek, and River Pasture which is located along the Malheur River and is excluded from livestock grazing. The Moffet Table Allotment evaluation, completed in 2003, recommended that juniper control be completed as a range improvement.

Mule Creek Allotment, which has a grazing season of use which goes from April 16 through September 30, is typically grazed under an early/graze treatment from April 16 through June 30 every year. There are six pastures within the allotment, three that are primarily made up of public lands (South Mule Creek, North Mule Creek, and Otis Mountain) and three pastures (Sexton Warlow, Herb Ward, and Lige Ward Field) that are primarily private lands. The Mule Creek Allotment evaluation was completed in 1992 and is scheduled to be reevaluated in 2007. The 1992 evaluation recommended that juniper control projects be completed in the allotment to improve range conditions.

Birch Creek Allotment consists of a single pasture which is grazed under a defer type of grazing treatment for a period between July 1 and September 15 each year. This allotment is at a fairly high elevation for public lands. The Birch Creek Allotment evaluation, completed in 2004, recommended that projects to increase forage available to livestock and wildlife be implemented in the allotment.

Otis Mountain Allotment is currently grazed from April 10 to June 15 or 25 depending on the year. Cattle are turned out at the lower elevation Water Gap Pasture for approximately 20 days under an early grazing use treatment. Cattle then move into one of the mid-elevation pastures (Birch Creek or Squaw Creek) where a graze treatment is used. On years that cattle use Birch Creek Pasture, cattle also use Basin Pasture for 25 days before going on to the National Forest on June 25. Cattle go directly to the National Forest on June 15 on years that the Squaw Creek Pasture is used. Also, on years that Squaw Creek Pasture is used, the permittee may use Basin Pasture under a deferred grazing treatment after seedripe of key forage plant species of grasses. The Otis Mountain Allotment evaluation was completed in 1992 and is scheduled to be reevaluated in 2008. In 1992, the allotment evaluation recommended that juniper control be completed with prescribed fire and mechanical methods.

There are another 1,159 acres of public land under custodial management in Big Upson Field Fenced Federal Range (FFR) (#5519) and Newell Field FFR (#5518) grazing allotments which are also within the Project Area. FFR, or custodial allotments, consist of small tracts of public land intermingled with large tracts of privately owned land within a grazing allotment. Public land in these two allotments has been designated for less intensive Federal management and has been identified for transfer out of public ownership through land exchange or sale in the land use plan.

Since the 1980s, annual allotment summaries have noted that available livestock forage is declining in these allotments due to juniper encroachment.

5. Recreation

The primary recreation activities in the Project Area are associated with big game hunting. Animals hunted in the area include mule deer, Rocky Mountain elk, and pronghorn antelope. Upland game bird hunting also occurs occasionally. Other recreation activities are associated with rock-hounding, photography, wildlife viewing, and driving for pleasure.

6. Visual Resource Management

The Project Area falls entirely within lands managed as VRM Class IV. Management direction from the Three Rivers RMP allows for modification of landscape character under this classification of visual resources. The treatment areas are remote and are not visible from any highway or main road.

7. Social and Economic Values

The communities surrounding the Otis Mountain/Moffet Table Project Area are considered rural in character, and have disproportionately high levels of unemployment compared with the Oregon State average of 7.3 percent and the national average of 5.8 percent. Harney County's unemployment rate averaged 8.2 percent in 2006, the second-highest rate among Oregon's 36 counties. Grant County's 2006 jobless rate was ranked highest in the State at 8.4 percent (Yohannan 2007).

Livestock and feed production industries are major contributors to the economy of Harney County. Harney County ranks ninth among counties in the United States for beef cattle production with nearly half of the County taxes realized from the ranching community (Census of Agriculture Results, Oregon Employment Department 2004). Production of beef in Harney County is directly linked to the commodity value of public and privately owned rangeland. According to information derived from Harney County the "…cattle industry is counted on to provide an average of $28,000,000 per year to the economy of the county," (www.harneycounty.com, 2003). Application of prescribed fire to grasslands and productive shrublands with late stage juniper encroachment can increase forage yield per acre by three-fold to four-fold the current production level.

Within Grant and Harney Counties, the forest products industry consists of three major sawmills and numerous logging or forestry companies. Total employment within the forest products industry in the two Counties consisted of 230 direct jobs in 2000 (Oregon Employment Department 2007). Contracts associated with forest management and prescribed fire preparation are frequently awarded to forestry firms from Harney or Grant Counties.

Hunting and other types of dispersed outdoor recreation also contribute to the local economy on a seasonal basis. There are approximately 500 direct hospitality and leisure jobs in the service sector of the two counties in the vicinity of the Project Area (Oregon Employment Department 2007).

8. Fire Management

The Otis Mountain/Moffet Table landscapes are divided into mountain big sagebrush/bunchgrass (55 percent), low sagebrush/bunchgrass (20 percent), ponderosa pine forest and pine woodlands (15 percent), and Wyoming big sagebrush/bunchgrass (10 percent) biophysical strata for the purpose of evaluating the current FRCC in the Project Area. A small portion of the acreage present in the lower elevations of the Project Area is classified as a basin big sagebrush/bunchgrass plant community. This potential stratum was not rated for FRCC as it would not be the target of any treatment under the proposed action. The entire Otis Mountain/Moffet Table Project Area was rated as FRCC 3, a condition that is highly departed from historic reference values.

In addition there are small amounts of riparian hardwoods, bitterbrush, and mountain mahogany stands in isolated and scattered patches throughout the Project Area. There are also surface fuel accumulations present in 690 acres of downed juniper distributed within 11 separate treatment units that are largely positioned within the mountain big sagebrush/bunchgrass stratum.

Eight of these units of downed juniper were ranked as a moderate priority for treatment of hazardous fuels under the Cut Juniper Hazard Abatement Project analysis (CX OR-04-025-070), while one was ranked as high priority. Two units of cut juniper are located on privately owned lands and were not prioritized for treatment. For the purpose of this FRCC analysis, areas containing previously cut juniper, mountain mahogany, bitterbrush, and small inclusions of quaking aspen will be considered within the mountain big sagebrush/bunchgrass stratum.

Following coarse scale definitions developed by Hardy et al. (2001) and Schmidt et al. (2002), the natural (historic) fire regimes of these major vegetative communities have been classified based on average number of years between fires (fire frequency) as well fire severity (amount of replacement) on dominant overstory vegetation.

The five fire regime classifications commonly interpreted for fire and fuels management purposes include:

I – 0-35 year frequency and low (surface fires most common) to mixed severity (less than 75 percent of the dominant overstory vegetation replaced);

II – 0-35 year frequency and high (stand replacement) severity (greater than 75 percent of the dominant overstory vegetation replaced);

III – 35-100+ year frequency and mixed severity (less than 75 percent of the dominant overstory vegetation replaced);

IV – 35-100+ year frequency and high (stand replacement) severity (greater than 75 percent of the dominant overstory vegetation replaced);

V – 200+ year frequency and high (stand replacement) severity.

The FRCC is a classification of the amount of departure from the natural fire regime (Hann and Bunnell 2001; Hardy et al. 2001). Coarse-Scale FRCC classes have been defined and mapped by Schmidt et al. (2002). They include three condition classes for each fire regime. The classification is based on a relative measure describing the degree of departure from the historic natural fire regime.

This departure results in changes to one (or more) of the following ecological components: vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated disturbances (e.g., insect and diseased mortality, grazing, and drought). There are no wildland vegetation and fuel conditions that do not fit within one of the three classes.

A simplified description of the FRCCs and associated potential risks is presented below.

Table 3-2. FRCCs (from Hann and Bunnell 2001)

FRCC	DESCRIPTION	POTENTIAL RISKS
Condition Class 1	Within the natural (historical) range of variability of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances	Fire behavior, effects, and other associated disturbances are similar to those that occurred prior to fire exclusion (suppression) and other types of management that do not mimic the natural fire regime and associated vegetation and fuel characteristics. Composition and structure of vegetation and fuels are similar to the natural (historical) regime.
Condition Class 2	Moderate departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances	Risk of loss of key ecosystem components (e.g., native species, large trees, and soil) are low. Fire behavior, effects, and other associated disturbances are moderately departed (more or less severe). Composition and structure of vegetation and fuel are moderately altered. Uncharacteristic conditions range from low to moderate; risk of loss of key ecosystem components is moderate.
Condition Class 3	High departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances	Fire behavior, effects, and other associated disturbances are highly departed (more or less severe). Composition and structure of vegetation and fuel are highly altered. Uncharacteristic conditions range from moderate to high. Risk of loss of key ecosystem components are high.

Mountain Big Sagebrush/Bunchgrass Stratum

Historic mountain big sagebrush/bunchgrass plant communities comprise approximately 55 percent of the Project Area. This stratum is composed of a shrubland occupying a mountainous landform. Within the mountain big sagebrush/bunchgrass stratum, historic fire frequencies were estimated to be 15 to 20 years (Miller and Rose 1999), which is natural fire regime classification II (high frequency, high fire severity). In general, the surface fire behavior fuel model for this stratum is currently a model 6 (Anderson, 1982). Fuel model six is composed of juniper with shrubs and fire behavior is characterized by moderate-fast spread and high fireline intensity. A majority of the acreage contained within the 11 downed juniper units is situated within this stratum. Prescribed fire was applied to 1,630 acres of the mountain big sagebrush/bunchgrass stratum between 2000 and 2002.

With the presence of vegetation in amounts that are uncharacteristic of the plant community under a historic fire regime, the vegetation currently within the Project Area is highly departed from historic conditions. Considering that fire has been excluded from more than 90 percent of this stratum for more than 100 years, the fuel composition, fire frequencies, and burn patterns within the Project Area also are considered highly departed from reference conditions. Based on the large amounts of vegetation within the Project Area that are uncharacteristic of the historic range of variability and the high level of fire exclusion that has occurred in the Project Area, this stratum is rated as FRCC 3.

Low Sagebrush/Bunchgrass Stratum

Historic low or stiff sagebrush/bunchgrass plant communities comprise approximately 20 percent of the Project Area. This stratum is composed of a shrubland and/or grassland occupying a mountainous landform. Low sagebrush communities burned every 200+ years historically (Miller et al. 2005); which is natural fire regime classification V (low frequency, high fire severity). In general, the fire behavior fuel model expected for this stratum is currently similar to a type two (Anderson 1982), although the herbaceous component in this stratum is most likely too sparse to generate the rapid rate of spread described for this fuel model. Fuel model two consists of open shrublands or pine stands and may include clumps of fuel that generate higher intensities. Fire spread is primarily driven by curing or dead fine herbaceous fuels and fire behavior is characterized by moderate-fast spread.

Composition of vegetation in the stratum is slightly to moderately departed from the composition of plant communities that would have existed under a historic fire regime. Considering that the low sagebrush stratum is estimated to have burned only every 200 years historically, the fuel composition, fire frequencies, and burn patterns within the Project Area are considered similar or slightly departed from reference conditions. Based on the moderate departure of vegetative composition and fire frequency in the low sagebrush/bunchgrass stratum within the Project Area, it is rated FRCC 2.

Ponderosa Pine Forest and Woodland Stratum

Potential ponderosa pine forest and woodland communities constitute approximately 15 percent of the Project Area. This stratum is composed of a pine dominated forest and/or pine woodland occupying a mountainous landform. Ponderosa pine forests and pine woodlands burned every 12 to 23 years historically (Maruka and Agee 2005); which is natural fire regime classification I (high frequency, low to mixed fire severity). In general, the surface fire behavior fuel models that can be expected within this stratum are currently a model nine and a model ten (Anderson 1982). Fuel model nine consists of a long needle conifer overstory with needle litter and some downed woody material at the ground surface. Fire behavior in this fuel type is characterized by fast moving fires and moderate to high fireline intensity. Fuel model ten consists of any forest type with greater than 3 inches of dead woody fuels and fire behavior is characterized by high fireline intensity with low levels of fuel moisture and moderate-fast rates of spread. Approximately 700 acres of thinning in the northeastern portion of the Project Area has reduced ladder fuels from mixed conifer forest within the current Rudy Treatment Area.

Although much of the understory has been thinned, especially in the northeastern portion of the Project Area, heavy needle cast and duff throughout the stratum often remain 4 to 12 inches deep. Forest overstory in this stratum primarily consists of a very dense, second-growth, stand of ponderosa pine. Due to fire suppression and insufficient management of forest overstory trees, these stands have a dangerous susceptibility to a catastrophic crown fire. The occurrence of a crown fire could quickly out-pace suppression capabilities and result in stand-replacement event similar to the Jordan Springs Fire. The Jordan Springs Fire was a 5,500-acre wildfire that burned pine forest and pine woodlands in 1994. It is located roughly 12 miles southwest of current Project Area and is within the Otis Mountain/Moffet Table cumulative effects area of analysis.

The upper layer of vegetation within the stratum has been largely unaffected by thinning treatments. Coniferous trees in excess of 9 inches in diameter are abundant throughout the stratum and canopy closure is often in excess of 75 percent. No prescribed fires or wildfires larger than a spot (<1-acre) are known to have occurred within the stratum within the last 100 years. Considering that only the understory of pine stands in approximately half of the stratum have been removed by thinning treatments, and fire or fire surrogates have otherwise been excluded for more than 100 years, fuels structure and patterns are considered highly departed from reference conditions. Since dense closed canopy forest occupy approximately 75 percent of the ponderosa pine forests and pine woodlands (65 percent more than reference conditions), and open canopy forests and woodlands are severely under-represented (less than 10 percent of reference condition) across the landscape, this stratum is rated as FRCC 3.

Wyoming Big Sagebrush/Perennial Bunchgrass Stratum

Wyoming big sagebrush/bunchgrass plant communities comprise approximately 10 percent of the Project Area. This stratum is composed of a shrubland occupying landforms of low hills and benches. Within the Wyoming big sagebrush/bunchgrass stratum, historic fire return intervals were estimated to be 35 to 100 years (Whisenant 1990), which is natural fire regime classification III (high frequency, mixed fire severity). In general, the surface fire behavior fuel model for this stratum is currently a type 6 (Anderson 1982). Fuel model six is composed of shrubs and fire behavior is characterized by moderate-fast spread and high fireline intensity. Cheatgrass is an invasive species present in the understory of many stands of Wyoming big sagebrush in the Project Area in amounts that are not considered characteristic of reference conditions.

The current structure and composition of the Wyoming big sagebrush/bunchgrass stratum is highly departed from reference values. Juniper encroachment and cheatgrass present in abundant quantities are not characteristic of Wyoming sagebrush\bunchgrass community reference conditions. A lack of early seral, grassy, fire-created openings also characterize the stratum. In light of these departures from reference conditions, this stratum is rated as FRCC 3.

9. Forests and Woodlands

The central part of the Project Area can generally be described as being ponderosa pine woodland. These stands are characterized by scattered large diameter ponderosa pines dispersed into the mountain big sagebrush/ bunchgrass/ mountain mahogany communities.

Figure 3.1 Example of overstocked ponderosa pine forest.

There are about one or two trees per acre and are generally greater than 24-inch dbh and are more than 250 years old. Locally dense pockets of these large pines occur, generally less than 5 acres in size. Throughout these units invaded ponderosa pines from 1 to 24 inches dbh may occur. These trees are generally less than 100 years old and can be characterized as being open grown and limby, with black bark and limbs most of the way to the ground. These trees became established due to the lack of wildfire and are considered to be far more common than the historical stocking levels. These pines and western junipers of similar age have invaded the mountain big sagebrush/bunchgrass and mountain mahogany communities and are beginning to occupy the site. Past management in the area has been limited to livestock grazing, some limited prescribed fires and fire suppression. Snags and downed logs occur infrequently. Health and vigor of the pine trees in these units is generally poor to fair (Schmitt and Scott, 2007).

Ponderosa pine forest dominates the Bluebucket Creek area in the northwestern portion of the Project Area and the Squaw Creek drainage in the northeastern corner of the Project Area. The vast majority of these stands can be characterized as having an overstory that is lightly stocked with large diameter (>24-inch dbh) ponderosa pine. Larger Douglas-fir stumps occur in localized areas within both the Bluebucket and Squaw Creek areas indicating a sparse overstory component existed in the past. Currently, canopy closure is estimated to average 75 percent in the Squaw Creek and Bluebucket Creek forested stands.

Throughout the Project Area the understory trees are substantially overstocked with far more trees per acre than what historically existed. The dense understory varies from a small pine reproduction (0 to 5 inches dbh) to pole timber (5 to 11 inches dbh) and areas of small sawtimber (11 to 21 inches dbh). Douglas-fir is also found throughout the Project Area as a scattered understory component. In the Squaw Creek forested stands, canopy base height is estimated to average 10 feet above the ground surface. The Bluebucket Creek forested stands have not been treated with substantial understory thinnings in the past and have an average canopy base height of 1-foot above the ground surface.

Past management in Bluebucket Creek has been limited to thinning, overstory removal and salvage cuts in the 1950s. In Squaw Creek, past management has occurred in the late 1960s and early 2000s. There was limited overstory removal and thinning that had taken place in the 1960. Beginning in 2003, thinning of understory has occurred to reduce some of the density and ladder fuels.

Decreasing canopy continuity and raising canopy base height by basal area reduction would be the next step to reduce effects of high-intensity crown fire (Agee 1996). Overall health and vigor of all of the stands is poor. Stocking levels are substantially higher than historical levels and has lead to increased stress on trees and increased susceptibility to pathogens. Pockets of bark beetle killed pines are common. A threat of Annosus root disease *(Fomes annosus)* is present in the Squaw Creek area and stems from adjacent private stands of timber. The number of snags is generally low with a few large diameter old pine snags. Within the Bluebucket Creek area are pockets of beetle killed pole sized snags and deformed pole sized pine that have incurred past porcupine damage. The common deformations in the affected trees are new leaders growing around the dead top or two or more new leaders (forking) where the original top was killed. The majority of forested areas have deep duff (4 to 12 inches deep) with minimal herbaceous and grass cover.

Aspen generally occurs on north and east facing slopes throughout the Project Area as well as a small stand of black cottonwood along Bluebucket Creek. These shade intolerant stands are being overtopped by conifers and are shrinking in size due to ongoing mortality and low reproduction rates. Where live aspen/black cottonwoods still do exist, they are of generally low vigor with skeletons of dead trees quite common.

10. Lands, Realty, and Roads

The land surrounding the Project Area is a mix of private and public lands. The USFS-administered lands make up the northern boundary of the Project Area. Through cooperative efforts many aspects of the proposed action, such as burning and juniper cutting may occur on private lands. Cooperative agreements with landowners would be affected prior to implementation of these phases of the project.

General access to the Project Area is via U.S. Highway 20 and the Pine Creek and Van-Drewsey County Roads. The primary access into the western part of the Project Area is via Forest Road 14 while the eastern portion is accessed by the Otis Valley County Road. Both are recognized public access routes and are maintained on a more or less frequent basis by Harney County and the USFS. They are surfaced, engineered roads with ditches, crowning and other drainage structures.

Direct access into specific units of the Project Area is available via two-track roads and trails which originate and connect to the above referenced primary roads.

It would be necessary for BLM to secure a license agreement or other appropriate authorization from the USFS for commercial log hauling on Forest Road 14 prior to that phase of the project. Similarly, an easement across private lands in T. 18 S., R. 35 E., Section 24 is needed for access and log hauling across those lands. In exchange for the easement BLM may grant a right-of-way to the landowner for a short section of existing road between the private lands and the Otis Valley Road. Access across other private lands for thinning and burning is typically secured through cooperative agreements with landowners.

CHAPTER IV: ENVIRONMENTAL CONSEQUENCES

The Environmental Consequences sections discuss in detail the environmental effects that would occur under the proposed action and a no action alternative. The effects of the no action alternative form a baseline against which all other alternatives are evaluated.

Environmental effects can be direct, indirect, or cumulative. They can be long or short in duration. Effects can be quantitative or qualitative, adverse or beneficial, actual or potential. Direct effects are those that are caused by the action and occur at the same time and place. Indirect effects are those that are caused by the action and are later in time or further removed in distance, but are still reasonably foreseeable (40 CFR 1508.8). In most cases, direct and indirect effects are discussed together with no distinction made between types of impacts.

Cumulative effects are the aggregate of incremental changes in resource condition that result from the present, past, and reasonably foreseeable actions. In order for project effects to be considered cumulative, they must overlap in time and space with the effects of previous or foreseeable project effects.

The Upper Malheur River, the Upper Malheur River – Griffin Creek, and the Otis Creek watersheds (5^{th} level HUCs) form the analysis area for effects on vegetation and fuels that are possibly cumulative with other project or wildfire effects. The three watersheds that comprise the cumulative effects analysis area encompass 329,529 acres of land administered by the BLM, the State, and the USFS and in private ownership. A vicinity map that displays the area of analysis for cumulative vegetation, fuels, and wildlife habitat effects is included in Appendix B.

A listing of past, present, and reasonably foreseeable activities is also identified in Appendix B. These activities were considered by each IDT specialist for potential cumulative effects.

These effects are discussed within each of the following resource effects sections. Only those activities that would create possible cumulative effects were analyzed within these resource effects sections.

As previously mentioned, it is possible that contingency areas beyond the Project Area boundaries could be burned under the proposed action, although these areas would not be targeted for treatment. Any environmental effects in contingency areas would be similar to those described for the targeted areas in the Environmental Consequences Chapter.

The proposed action includes project design elements developed to avoid damage of SSS habitat, retain big game cover, avoid cultural resources, and reduce conflict with recreational uses. Project design elements would reduce effects related to loss of soil productivity and sedimentation of water sources to levels that are immeasurable at a watershed scale. Effects of smoke on air quality would be short-lived and would not have the potential to combine with the effects of other burning projects. Therefore, the cumulative potential of these effects is not analyzed further in this document.

The temporal scales used throughout the effects analysis are described as short, mid- and long term. Unless otherwise stated, short term represents impacts that may occur in less than 5 years, mid-term 5 to 20 years, and long term more than 20 years.

A. No Action: Critical Elements

1. Air Quality

Under the no action alternative no fuel treatments would occur. The potential for wildfires to occur would be greater where fuel treatments do not occur. The impact to air quality would probably be greater from a wildfire occurring in the area as wildfires typically have a longer ignition phase, or burn longer, consume more of the burnable biomass and produce more smoke and particulate matter than prescribed fires. The area in question would continue to amass woody debris in the absence of treatment.

2. Water Quality/Wetlands and Riparian

Under this alternative, juniper and other conifers would expand and become increasingly established in riparian areas. Continued expansion would decrease riparian vegetation diversity, and the productivity and function of riparian areas. The loss of desired riparian species (e.g., willow, sedges, and cottonwood) to conifer encroachment could lead to deterioration of stream channel integrity, bank stability, and water quality. High water events could lead to further degradation of channel integrity and water quality.

Juniper and other conifers invade riparian areas by shading out or outcompeting desired riparian species. Conifer expansion into riparian areas and stream corridors would not likely lead to immediate degradation of stream channels, water quality, and fish habitat; rather it would likely be a slow process that would compound over time.

Riparian vegetation such as sedges, rushes, grasses, and woody species such as willow, alder, aspen, red osier dogwood, and cottonwood are important for maintaining stream channel integrity, water quality, and fish habitat. The root systems of these plant species stabilize and protect streambanks from eroding during high water events. Streambanks covered with herbaceous vegetation and stands of woody species catch sediment during high water events and help maintain and restore flood plain function. Deep-rooted riparian vegetation also dissipates the energy associated with high water, thus reducing the erosive potential of high water.

Juniper stands tend to have less complex vegetative communities, less understory cover, and more bare soil, and bare inter-canopy areas exhibit high rates of erosion (Reid et al. 1999). When riparian areas are dominated by juniper, high flow events have greater potential for erosion, leading to bank instability and subsequent channel degradation.

Riparian vegetation plays an important role in maintaining water quality. Water quality can be degraded by changes in chemical/nutrient content, temperature, turbidity, and levels of sedimentation. Juniper and conifer expansion into riparian areas can lead to degraded water quality from streambank instability, degraded channel morphology, loss of storage capacity, and reduced potential for groundwater recharge. The resulting impact can lead to increased sedimentation and changes to nutrient cycles associated with the loss of deciduous and herbaceous vegetation. Groundwater recharge affects low or late season flows and thus water temperature.

Selection of a no action alternative would maintain current condition and trend of riparian areas, until an event such as high severity wildfire or flood occurs. There would be a short-term negative effect on water quality in the event of a wildfire. High severity wildfire can result in pulses of increased sediment delivery to streams. As conifers became increasingly dominant in riparian zones, banks would become less stable from loss of deep-rooted riparian vegetation. In forested riparian zones, accelerated growth toward late successional conditions expected from the thinning prescriptions would not occur.

3. Migratory Birds

Under the no action alternative, no disturbance to migratory birds would occur due to human activity. Rangeland plant communities would continue the transition to juniper woodlands while the stocking of ponderosa pine forests increased. When western juniper density and cover increase to the point that shrub and herbaceous understory are suppressed, avian species diversity decreases (Reinkensmeyer and Miller 2000). This has already happened over roughly 50 percent of the mountain big sagebrush community in the Project Area. Avian species diversity is also likely to decrease as conifer stands continue to increase in basal area. Mountain mahogany and aspen stands would also continue to be encroached upon and outcompeted by juniper and pine trees, which would lead to the eventual loss of these habitats. A loss of these habitats would also lead to a loss in avian species diversity. This alternative would favor the relative few species that prefer juniper woodlands and densely overstocked conifer stands. The no action alternative is likely to have no effect on golden eagles. Overall, the net effect of the no action alternative is a decrease in avian species diversity.

4. Special Status Species (Fisheries and Wildlife)

Fisheries

Under the no action alternative, fuel loads would not be reduced across the Project Area. The current condition and trend would be maintained, until a wildfire event. During the past century, fire suppression and timber harvest has altered fuel loads and forest structure in the dry forest communities of the Project Area. Because of this, the probability of large stand-replacement fires has increased in those areas. Changing fire regimes and the potential for larger more destructive fires may threaten the loss of aquatic habitat diversity and lead to accelerated extinction of some vulnerable populations (Elliot 2006).

Fish habitat would likely be affected by the loss of riparian species following juniper and other conifer invasion. While these effects would not occur immediately, there would likely be a slow unraveling or degradation of habitat conditions that would be accelerated during watershed disturbances. Potential effects of degraded habitat include loss of habitat complexity, bank instability, change in groundwater storage and release, increased water temperatures, and a likely change in macroinvertebrate density and diversity. The long-term impacts of juniper-dominated riparian areas include decreased water quality and aquatic habitat condition.

Under this alternative, conifers would continue to encroach into riparian communities. The effects of conifer invasion are discussed above. Wildfires and other projects outside of the Project Area would be the only mechanisms operating to reduce the level of conifer encroachment. A continued decline in stream habitat conditions may cause a downward trend in redband trout populations. As the downward trend in habitat quality continues, restoration cost increases and its feasibility declines.

Terrestrial and Avian Wildlife

There are no known effects to Threatened or Endangered wildlife species under this alternative. The no action alternative would have effects on Greater sage-grouse, northern goshawks, flammulated owl, northern pygmy owl, pileated woodpecker, Lewis's woodpecker, Williamson's sapsucker, white-headed woodpecker, pygmy nuthatch, olive-sided flycatcher, loggerhead shrike, Brewer's sparrow, sage sparrow, and several species of bats and/or their habitat. There would be no direct effect on these species as a result of human actions under the no action alternative.

Areas of potential sage-grouse habitat, that are currently nonfunctional under the influence of juniper and pine encroachment, would remain in existing conditions. As juniper and pine encroachment progresses, areas that are offering nesting, brood rearing, and wintering habitat for sage-grouse would experience a decrease in herbaceous and shrub cover and an increase in predatory raptor perches. Eventually these areas would also become nonfunctional as sage-grouse habitat. In the long term, most of the Project Area may become unsuitable for sage-grouse due to the advancement of juniper and pine encroachment under this alternative.

Potential goshawk nesting habitat would continue to be encroached upon by juniper and overstocked by second growth trees under this alternative. These areas would remain suitable for goshawks until a stand replacement wildfire occurred. However, northern goshawks prefer healthy forested sites that have more open understories. Therefore, although the habitat is likely to remain suitable for northern goshawks it would continue to decrease in quality. A high intensity wildfire could have devastating effects on their habitat if one were to occur.

The no action alternative is likely to have long-term negative effects on Special Status avian species that are associated with the forested sites. These include the Lewis's woodpecker, Williamson's sapsucker, white-headed woodpecker, pygmy nuthatch, and the olive-sided flycatcher. Habitat quality for these species would generally continue to decrease as forest health is expected to decline and the understory and overstory continue to become overstocked. If a wildfire occurred there could be drastic impacts on the habitats these species are currently using.

The no action alternative would increase canopy closure favoring the flammulated owl, northern pygmy owl, and pileated woodpecker. However, overall habitat quality for these species would likely decline as understory basal area increases and overall forest health decreases.

Brewer's sparrows, sage sparrows, and loggerhead shrikes would be negatively impacted as a result of the no action alternative in the long term. Habitat quality in the Project Area for these species has already been degraded by juniper and other conifer encroachment and would continue to decline as these species continue to encroach upon the sagebrush plant communities.

The no action alternative is likely to have no effect on Special Status bat species until a stand replacement wildfire burns through the Project Area. A stand replacement wildfire would likely remove at least some of the bat roosting trees.

5. Noxious Weeds

Under the no action alternative, there would be increased risk of noxious weed invasions or expansions of existing populations in the Project Area as risks of a large-scale wildland fire increase. Hazardous fuels accumulations in the overstocked ponderosa pine stands and completed juniper cuts would remain in place and understory plants within mountain big sagebrush plant communities would continue to decline under the influence of juniper encroachment. Wildfires that occur in post-settlement juniper woodlands and overstocked pine forests tend to be severe enough to kill large numbers of understory plants. These conditions are conducive to noxious weed invasion.

6. Cultural Resources

Under the no action alternative, there would be no direct effect on cultural resources identified in the Otis Mountain/Moffet Table Project Area as no prescribed fire or mechanical treatments would be implemented.

However, with no implementation of ecological restoration activities, the archaeological record within the Project Area would continue to be altered by processes associated with bare ground under juniper woodland canopy. As plant density and cover decreases under juniper woodlands, archaeological deposits may be subject to accelerated surface erosion (Buckhouse and Mattison 1980).

Risks of archaeological deposit alteration by wildfire or fire suppression increase under the no action alternative as existing hazardous fuels remain in place and juniper woodlands expand.

7. American Indian Traditional Practices

Under the no action alternative, floral resources important to the traditional practices of the Burns Paiute Indian Tribe would remain in their present condition.

Habitats important to the continuation of Burns Paiute traditional practices in the area would be increasingly in jeopardy of disturbance by large-scale intense wildfire events and juniper woodland expansion.

B. No Action: Noncritical Elements

1. Soils

Under the no action alternative, there would be no additional compaction or displacement that would impact the soil resource.

The risk of soil damage and accelerated erosion following a large-scale wildfire would increase as fuel accumulates over time. Bare ground beneath juniper woodland canopies would increase over time and risk of surface erosion would increase.

At a watershed scale, these effects would be cumulative with the effects of conifer encroachment elsewhere in the Upper Otis Creek, Bluebucket Creek, Griffin Creek, and Cottonwood Reservoir watersheds.

2. Vegetation

Under the no action alternative, trends described in the plant communities would be unchecked. Expansion of western juniper into shrub steppe plant communities would continue at the expense of understory cover, density, and diversity. Perennial grasses and forbs would continue to decline as stands of juniper developed into closed canopy woodlands. Density and vigor of sagebrush, bitterbrush, and mountain mahogany shrubs would decline under the no action alternative. Loss of upland aspen stands to conifer encroachment would continue to occur.

The risk of a stand replacement wildfire occurring in shrubland plant communities would remain the same or increase over time. High intensity wildland fire combined with a depleted herbaceous understory would continue to be factors contributing to a landscape level conversion of historic plant communities. Stands of shrubs, grasses, and forbs currently under downed juniper slash within the 11 previously treated cut units in the Project Area would be particularly vulnerable to a high intensity wildland fire.

3. Wildlife

Under the no action alternative, no disturbance to wildlife would occur due to human activities. Plant communities would continue to transition toward juniper woodlands with reduced herbaceous understories. Ponderosa pine stands would continue to be overstocked with second growth trees and encroached upon by Douglas-fir and juniper. These conditions would continue to reduce the herbaceous and shrub component in the understories. Browse species, (bitterbrush, big sagebrush, chokecherry, etc.) that elk and especially deer rely upon in the winter would continue to decrease in quantity, health and vigor, and palatability. Mountain mahogany and aspen stands would also continue to be encroached upon and outcompeted by juniper and pine trees, which would likely lead to the eventual loss of these habitats. This would cause a decrease in habitat quality for big game species as well as several bird and small mammal species which utilize these habitats. This loss of habitat would eventually reduce the habitat capacity for supporting current populations of these species.

Thermal and hiding cover would increase under this alternative until a stand replacement wildfire occurred. Habitat quantity and quality for those species that prefer dense juniper woodlands or overstocked conifer stands would increase, while it would decrease for those species that prefer more open areas and/or forested stands with more open understories, as a result of the no action alternative.

4. Livestock Grazing Management

As plant communities being invaded by western juniper moves toward a fully-developed juniper woodland in the Moffet Table (#5511), Mule Creek (#5515), Birch Creek (#5516), Otis Mountain (#5517), Big Upson Field (#5519), and Newell Field (#5518) grazing allotments continues, forage production and diversity would be lost. The shrub component of these plant communities would begin to experience high rates of mortality before major effects occur to the herbaceous species. The effects to grasses and forbs would be site-specific and may occur later in the transition to juniper woodlands.

A long-term effect would be reduced forage availability (Bates et al. 1999 and 2000). The effect of reduced forage production would cause changes to current livestock management practices and possible adjustments to livestock stocking levels. Any changes in management would be determined through rangeland monitoring. Wildfire occurrence may require that affected pastures are rested from livestock grazing for at least two growing seasons (May 1 to June 30) following the burn.

5. Recreation

There would be no direct effect to recreational activities under this alternative. Under the no action alternative there are more likely to be brief disruptions to recreational activities in the vicinity of the Project Area from fire suppression and smoke during the summer and fall seasons.

In the long term, big game hunting opportunities would diminish as habitat conditions decline due to the loss of species and structural diversity in rangeland and ponderosa pine woodland plant communities.

6. Visual Resource Management

There would be no effects anticipated to visual resources under the no action alternative in the short term. In the long term, visual resources would be impacted due to the loss of diversity of plant communities and structure on the landscape.

7. Social and Economic Values

There would be short-term negative effects on the local economy under the no action alterative. Under the no action alternative, no service contracts would be granted, no jobs or raw materials would be generated, and no supplies would be purchased for the purpose of project implementation.

The value of livestock that are grazed on public and privately owned lands within the Project Area may eventually decline under the no action alternative as forage productivity is reduced over time.

The local economy may also be affected as big game hunting opportunities in the Project Area are reduced under the no action alternative as habitat quality deteriorates.

8. Fire Management

Fire would not be reintroduced under the no action alternative. Rangeland plant communities would continue on a predicted successional transition to fully-developed juniper or ponderosa pine woodlands (Miller et al. 1996). Pine dominated forest stands would continue to present a severe crown fire hazard and threaten private property and resource values. Firefighters would be placed at greater risk as during future suppression efforts in environments with elevated fuel loads.

9. Forests and Woodlands

Under the no action alternative, mountain mahogany, aspen, black cottonwood, and bitterbrush would continue to decrease in abundance and would die from being overtopped by invaded ponderosa pine, Douglas-fir, and junipers. These invaded conifers would continue to thrive at unprecedented population levels. It is highly likely that any wildfire would occur as a stand replacement event, damaging valuable habitats and vegetative resources.

In ponderosa pine dominated forest stands, continuation of the no action alternative would continually impact stands over time. The large diameter ponderosa pine trees in the overstory would continue to die from western pine beetle and pine engraver attack and not be replaced by other medium to large trees (Cochran 1994). The ponderosa pine understory would remain stagnant with a slow growth rate while continuing to suffer pockets of heavy mortality from mountain pine beetle and pine engraver (Obedzinski et al. 1999). Overall, tree vigor would remain low, mortality high, and the large diameter ponderosa pine component would be diminished and not replaced for decades, assuming the Project Area does not experience a stand-replacement wildfire. Douglas-fir trees infected with the mistletoe pathogen would continue to increase fuel ladders and cause mortality. The remnant aspen stands would continue to suffer mortality from being overtopped by invaded ponderosa pine and junipers (Wall et al. 2000). The few aspen suckers would continue to be heavily browsed and the aspen clones would face eventual stand death. It is highly likely that any wildfire would become a stand-replacement fire, damaging valuable habitats and vegetative resources.

10. Lands, Realty, and Roads

Under the no action alternative there would be no effects to private or National Forest lands as a result of human disturbance. The risk of an intense wildland fire occurring within the Project Area and carrying onto other lands would remain high and increase as fuel loads continue to build.

There would be little if any road damage as a result of no project implementation.

C. Proposed Action: Critical Elements

1. Air Quality

The proposed action would produce smoke from prescribed fires and to a lesser degree dust from mechanical treatments. Impacts to air quality from prescribed fire and pile burning could range from reduced visibility, to pneumonic irritation, and smoke odor affecting people in proximity to the Project Area when such treatments are underway. These impacts are short-lived, the greatest impact occurring during the actual ignition or active burning phase, lasting from one to a few days depending on the size or number of actual burn units or number of piles to be ignited. Residual smoke produced from the burnout of large fuels, or slower burning fuel concentrations could occur, lasting for one to three days following the ignition phase. Impacts to air quality from mechanical treatments would be airborne dust generated while operating that would reduce visibility in the immediate Project Area, ceasing quickly when such operations stop.

A proximity analysis (Appendix C – Otis Mountain/Moffet Table Smoke Management Proximity Analysis) of the Project Area for smoke impacts indicated that residences in the Drewsey Valley, developed campsites and various County Roads may potentially be impacted. The proximity analysis also indicated the communities of Drewsey and Buchanan may possibly be impacted as they are located to the south and southwest, respectively of project center. Based on their location from project center with respect to the common wind vectors for the Project Area the likelihood of substantial impact is low. Subsequent site-specific burn plans should contain a contact list of residents, and/or other places of interest adjacent to the Project Area to communicate potential impacts.

The areas of greatest impact from prescribed fire would be those areas downwind and down drainage from the Project Area. A review of dominant wind vectors and topographic features indicates that these areas are typically west, southwest, south, and southeast and east, respectively of the Project Area. The amount of impact would be dependent on atmospheric conditions at the time of ignition. Prescribed fires are planned and implemented when atmospheric stability and wind conditions promote smoke dispersion into the atmosphere and/or transport out of the area. In addition they are planned when diurnal wind conditions limit the amount of smoke pooling in canyons and valleys. The Strawberry Mountain Wilderness Class I airshed, located in the northernmost portion of the smoke management area (Appendix C – Otis Mountain/Moffet Table Smoke Management Area), is highly unlikely to be impacted by smoke due to dominant wind vectors in the region that come from the west and southwest.

The areas of greatest impact from mechanical treatments would be the immediate Project Area and unimproved, (i.e., dirt) roads, used in association with the project.

Other prescribed fire and mechanical fuel reduction projects are planned for the Three Rivers Resource Area and adjacent Malheur National Forest. While the cumulative effect may be impacted air quality, the impact would be short-lived, focusing on the time of project implementation to a few days post treatment.

2. Water Quality/Wetlands and Riparian

Reintroducing and mimicking natural processes that have been excluded from riparian zones (e.g., juniper and other conifer removal and prescribed burns) would result in a positive vegetation response. Prescribed burns would be initiated when conditions are conducive to lower intensity burns, which would reduce the potential of losing desired riparian vegetation. In the burned areas, most of the herbaceous and root sprouting shrubs would retain their live rooting systems intact and hold the soil in place.

Deciduous riparian vegetation with high fuel loading that have the potential to burn very hot would be pretreated by manual reduction to reduce fuel loads. It is typically only during the first season after the burn and before vegetation begins growing that burned sites are vulnerable to accelerated erosion from rainfall.

Riparian plant species possess adaptations to fluvial disturbances that facilitate survival and reestablishment following fires, thus contributing to rapid recovery of streamside habitats (Dwire and Kauffman 2003). Prescribed fire treatments usually result in mosaic burn patterns that include patches of unburned living vegetation following treatment. These unburned areas would reduce immediate risks of increased water turbidity and stream sedimentation by providing cover and roots that stabilize sediments and serve as sediment traps. Reeves et al. (1995) stated that fire can be important for maintaining complex and productive habitats.

Reducing competition from juniper and other conifers in riparian zones should facilitate recovery of deciduous woody and herbaceous riparian communities to a more historic regime. This would improve watershed stability and function by reducing bare soil and sediment inputs, stabilizing banks, increasing infiltration, and maintaining or restoring proper storage and release of groundwater important for late season flows and temperatures. Water quality would improve with enhanced watershed function where erosion is minimized, sediment inputs are minimized, channel bank stability is reinforced, infiltration rates increase, and potential for groundwater recharge is restored.

By reducing high fuel loads throughout the Project Area, the risk of a large-scale high severity wildland fire would be reduced. Where riparian vegetation appears to be well-adapted to low severity fires, mortality rates are highest when the litter layer and root crowns are consumed by fire (Dwire and Kauffman 2003). High severity burned areas also experience higher rates of soil loss from erosion, increased peak flows of runoff, greater duff reduction, loss of soil nutrients, and soil heating. If organic layers are consumed and mineral soil layers are exposed, soil infiltration and water storage capacities are reduced (Robichaud 2000). By treating fuel loads within the Project Area the risk of these effects would be reduced.

Outside of the Project Area, a portion of the Bluebucket Creek subwatershed is scheduled to be underburned in 2009. This will affect 1.8 miles of Bluebucket Creek downstream of the Project Area. The proposed underburn will have negligible negative effects as the burn will be conducted in a manner that is conducive to a lower intensity burn. No mechanical pretreatments will occur from that project. The scheduled underburn would cumulatively reduce fuel loading within the Bluebucket Creek subwatershed and thus reduce the risk of a high severity fire negatively impacting riparian habitat.

Concurrent actions within the Project Area include livestock and wild ungulate grazing. Livestock grazing is managed to provide for upward trend in riparian condition which eliminates any negative effects that could be cumulative with fuels reduction treatments. Areas of the project would be rested a minimum of two growing seasons following a broadcast burn. The duration of the rest cycle would be determined by rangeland monitoring. Due to landscape scale of the treatments, cumulative effect from wild ungulates would be minimal. Treatments would occur across a large area in order to disperse use from wild ungulates and domestic livestock.

3. Migratory Birds

The effects on migratory birds would depend on the treatment and vegetation that is being treated. The overall net effect of the proposed action would likely be an increase in habitat diversity and an increase in avian species diversity. Direct impacts to migratory birds would be minimized by broadcast burning in the fall, and cutting and piling in the fall where determined necessary. The proposed action is likely to have little or no effect on golden eagles.

Sagebrush and Shrub-Steppe Communities

Where junipers have developed into woodlands on mountain big sagebrush/bunchgrass and low/stiff sagebrush sites migratory bird diversity and richness is relatively low. The use of prescribed fire and/or mechanical cutting in these areas will regenerate grasses and forbs. Shrubs including sagebrush and bitterbrush would also regenerate as a result of the proposed action. As these species regenerate bird diversity and richness is likely to increase. However, these actions would have adverse impacts on species that prefer woodland habitat. Birds nesting in cavities in large western juniper would be minimally affected as these large juniper trees are generally fire resistant, and would not be targeted by mechanical treatments.

In areas where juniper is in an early to intermediate stage of transition to woodlands, migratory bird diversity and richness is relatively high. This habitat type is relatively infrequent in the Project Area as most areas are in a latter transitional stage toward fully-developed juniper woodlands. It is also a transient habitat type as these areas eventually developed into fully-developed juniper woodlands. When western juniper density and cover increase to the point that shrub and herbaceous understories are suppressed, avian species diversity decreases (Reinkensmeyer and Miller 2000). The proposed action is to treat 40 to 60 percent of the early to mid-transitional areas with a broadcast burn and much of the remaining area with cutting followed by pile burning or jackpot burning. It is also an objective to broadcast burn 90 to 100 percent of the areas in the latter stages of transition to juniper woodlands. Most of these areas would be treated with prescribed fire, although some mechanical treatments may be utilized in these areas. In the short term, bird species diversity would decrease in broadcast burn areas as habitat complexity decreases and plant communities are move back to early seral stages. However, overall bird species diversity in the Project Area would be maintained as the proposed action creates a mosaic burned and unburned areas. Overall, the proposed action should increase migratory bird species diversity in the long term as structural diversity of the habitat will increase as plant succession takes place. Birds nesting in cavities in large western juniper would probably not be affected as these large juniper trees are fire resistant, and would not be targeted by mechanical treatments.

Forested Areas

The proposed action would open up the stands allowing grasses, forbs, and shrubs to regenerate. The opening of the stands would also increase the health and vigor of retained trees, thus, promoting larger trees in the long term. Existing snag and downed woody debris habitat would be retained to the extent practical. A few of the existing snags and large downed woody debris are likely to be lost during the prescribed fires, but new snags and large downed woody debris are likely to be created by the prescribed fire. All of the above would increase vegetative species and habitat diversity, which would likely increase avian diversity and richness.

In the long term, cavity nesters and other birds that utilize snags and larger trees would be beneficially affected as the proposed action would protect existing large trees and snags while promoting large tree recruitment in the future. Other avian species that favor open stands would be beneficially affected as well. There would be a reduction in habitat quality for birds that prefer dense conifer understories or a high degree of canopy closure.

Mountain Mahogany, Aspen Stands, and Riparian Plant Communities

Migratory bird species, which utilize mountain mahogany, quaking aspen, and riparian communities, would be beneficially affected as the proposed action would protect and enhance these vegetative communities. Migratory bird diversity and richness is generally very high in aspen stands and riparian plant communities. Removal of juniper and other conifers from these communities would increase the health and vigor of the stands, thus stimulating regeneration and recruitment of younger trees. Fencing of aspen stands would provide protection of the young and regenerating trees from browsing animals further promoting the regeneration of the stand. Protection and enhancement of these communities would ensure long-term availability of these habitats for migratory birds in the future. The net effect of treating mountain mahogany stands and riparian communities would be increase in avian species diversity in the future.

The proposed action would cause both immediate and long-term benefits for Brewer's sparrows, sage sparrows, and loggerhead shrikes. Treatments that involve felling of juniper or killing juniper with fire would immediately improve habitat quality for these species. Broadcast burn treatments may initially degrade the habitat for these species as both sagebrush and juniper would be consumed by the fire, but it should improve habitat quality for these species in the future when sagebrush reestablishes itself. The net effect of the proposed action would likely be an increase in avian species diversity in the long term.

4. Special Status Species (Flora, Avifauna)

Fisheries

Generally, fish species present in the Project Area are not expected to be adversely affected by disturbances to habitat resulting from prescribed burning and silvicultural thinning activities. Ground disturbance occurring in the uplands would be located sufficient distances from stream channels to avoid introduction of fine sediments.

Reestablishing more natural patterns and processes would lead to restoration of more complex, productive aquatic habitats. Treatment of juniper and other encroached conifers in riparian areas would facilitate recovery of a riparian deciduous community and restore the riparian zone to more historic conditions and reduce the risk of a high severity wildland fire. The existing deciduous (alder, cottonwood, dogwood, willow species) component would also be enhanced due to reduced competition with conifers. By expanding the deciduous community, greater bank stability, sediment capture, long-term stream shading, nutrient input, and water storage and release is expected. Late season release of cool groundwater is important for fish survival during low flows.

Larger conifers that would be selectively cut and felled into the flood plain would provide for future large wood recruitment into the stream channel. This would eventually provide cover and habitat complexity for fish. Expanding the riparian hardwood community would also affect the aquatic food web. Seasonal inputs of terrestrial insects from riparian areas are an important food source for drift feeding fish species (Young et al. 1997). These inputs are highest from closed-canopy riparian areas dominated by deciduous plant species (Elliot 2006). Altering the vegetation within the riparian zone to facilitate expansion of existing deciduous vegetation would improve aquatic habitat and conditions for fish.

The activities proposed along fish bearing streams would have no effect to Special Status fish species so long as the project design elements are observed. No temporary roads would be constructed within riparian zones and mechanical treatments would be limited to hand cutting and piling. Piles would be burned outside of the flood plain. This would minimize ground disturbance and sediment entering into the stream. Prescribed underburns in the uplands would be initiated when conditions are conducive to lower intensity burns. Low intensity fire in the riparian zone would most likely result in a patchy burn pattern and leave shade-providing riparian vegetation. A patchy burn would also minimize the chance of excessive sediment delivery to streams because sediment trapping vegetation would still remain.

Water temperature on Bluebucket Creek, the only known fish bearing stream on public land within the Project Area, is not expected to increase from the proposed action. Field observations indicate that the topography and channel orientation of the stream combined with the expected canopy retention on adjacent hillslopes would not result in a net loss of effective stream shade.

Outside the Project Area, a portion of the Bluebucket Creek subwatershed is scheduled to be underburned in 2009. This will affect 1.8 miles of Bluebucket Creek downstream of the Project Area. The scheduled underburn will have negligible negative effects as the burn will be conducted in a manner that is conducive to a lower intensity burn. No mechanical pretreatments will occur from that project. The scheduled underburn would cumulatively reduce fuel loading within the Bluebucket Creek subwatershed and thus reduce the risk of a high severity fire negatively impacting riparian aquatic habitat.

It is expected that due to the spatial location and low magnitude of anticipated effects, sediment moving into stream channels due to the proposed action would not reach the Malheur River, and the condition of bull trout habitat would be maintained.

Terrestrial and Avian Wildlife

There would be no known effects to Threatened or Endangered wildlife species under this alternative. The proposed action would have effects on Greater sage-grouse, northern goshawk, flammulated owl, northern pygmy owl, pileated woodpecker, Lewis's woodpecker, Williamson's sapsucker, white-headed woodpecker, pygmy nuthatch, olive-sided flycatcher, loggerhead shrike, Brewer's sparrow, sage sparrow, and several species of bats.

The proposed action is in compliance with the Greater Sage-grouse Conservation Assessment and Strategy for Oregon: A Plan to Maintain and Enhance Populations and Habitat (2005). In mountain big, low, and stiff sagebrush communities in a mid-to late transitional stage toward fully-developed juniper woodlands there would be long-term beneficial impacts toward sage-grouse and their habitat as a result of the proposed action. These areas are currently considered to be unsuitable for sage-grouse due to juniper encroachment. Prescribed fire and juniper cutting would remove most of encroaching juniper from these plant communities. Mechanical treatments would immediately benefit sage-grouse and their habitat. This treatment would remove predatory raptor and raven perches while maintaining and invigorating the sagebrush and herbaceous understory. All habitat components for sage-grouse would be improved as a result of the mechanical treatments, especially nesting habitat in the big sagebrush communities and brood rearing in the low sagebrush communities. Roughly half of the early to mid-transitional mountain big sagebrush sites would be broadcast burned. Broadcast burning would remove juniper as well as the shrubby understory. Nesting and wintering habitat for sage-grouse would eventually come back in these areas as mountain big sagebrush reestablishes itself. These areas would likely offer quality brood-rearing habitat for sage-grouse in the short term as there is likely to be a flush of forbs after the broadcast burn treatments.

Overall, the mountain big sagebrush and low and stiff sagebrush sites that are currently considered to be unsuitable for sage-grouse due to juniper encroachment would likely again become functional sage-grouse habitat as a result of the proposed action.

Some areas classified as sage-grouse habitat and/or probable sage-grouse habitat, context unknown, is proposed to receive prescribed fire and/or mechanical treatments. Areas within these habitat types proposed for treatment are the places where juniper has already or has begun to encroach. Although these areas may be receiving some sage-grouse use now, as juniper encroachment continues sage-grouse use would decline and these areas would eventually cease to function as habitat. The broadcast burn treatments in these areas would likely displace sage-grouse during much of year in the short term, but in the long term would improve habitat as mountain big sagebrush/bunchgrass communities reestablish in the burned areas. Sage-grouse may benefit nutritionally in the short term by the flush of forbs expected to occur after burning. The mechanical and single-tree burning treatments in the low and stiff sagebrush sites would have immediate beneficial impacts on sage-grouse.
There would be no known direct effects to northern goshawks as there are no known nest sites within the Project Area. Should a nest site be discovered, a project design element would be in place to protect both the birds and the nesting habitat. Effects on goshawks would be minimal as nesting and fledging seasons would be avoided if necessary. Under the proposed action, northern goshawk habitat would either be maintained or enhanced. The proposed action would improve forest health, reduce the stocking levels of the understory, and promote aspen regeneration, all of which should favor goshawks. Goshawk prey populations would likely increase as the proposed action is likely to attract more songbirds to the area. Goshawk habitat is also likely to persist in the event of a wildfire. Overall, the proposed action should improve goshawk habitat in the Project Area.

The proposed action is likely to benefit the flammulated owl, northern pygmy owl, pileated woodpecker, Lewis's woodpecker, Williamson's sapsucker, white-headed woodpecker, and pygmy nuthatch. These cavity nesting species are dependent upon large trees and snags for nests. The proposed action would protect existing snags, large downed woody debris, large trees and promote recruitment of large trees which should benefit these species in the long term.

All of these species should benefit from the opening of the understory. The proposed action would remove approximately 30 to 50 percent of the trees that make up the forest canopy in the Rudy and Bluebucket Treatment Areas.

This part of the proposed action should benefit Lewis's woodpecker, Williamson's sapsucker, white-headed woodpecker, and pygmy nuthatch as they prefer more open canopies. It would negatively affect flammulated owl, northern pygmy owl, and pileated woodpeckers as they prefer closed canopies. However, the variable nature of the Silvicultural Thinning treatment would ensure that there are portions of forest where canopy closure would remain high and not affect habitat quality for these species. The olive-sided flycatcher would also be beneficially affected as the proposed action would open the understory and promote larger tree growth.

The proposed action would cause both immediate and long-term benefits for Brewer's sparrows, sage sparrows, and loggerhead shrikes. Treatments that involve felling of juniper or removal of pine encroaching into shrub-steppe habitat would immediately improve habitat quality for these species. Broadcast burn treatments may initially degrade habitat for these species as both sagebrush and juniper would be consumed by the fire, but it should improve habitat quality for these species when sagebrush reestablishes itself.

The Special Status bat species found within the planning area are likely to either be benefited or not be affected by the proposed action. The proposed action would protect existing roost trees, and would promote larger trees which could potentially become roost trees.

5. Noxious Weeds

Under the proposed action, there would most likely be no increase in populations of noxious weeds, or establishment of new populations, provided appropriate project design elements are observed and treatments are monitored as described in the project monitoring plan (Appendix A, Otis Mountain/Moffet Table Prescribed Burning Monitoring Plan). Follow-up treatments on noxious weeds identified during project monitoring would be performed as described in the Burns District Noxious Weed Program Management EA OR-020-98-05.

6. Cultural Resources

Under the proposed action, there would most likely be no detrimental effect on cultural resources provided the established project design elements are observed. Prescribed fire treatments that could diminish the data potential of archaeological sites would not be utilized within site boundaries.

Conversely, fuel reductions treatments would enhance the long-term stability of prehistoric and historic era archaeological properties. As the likelihood of a large-scale, high severity wildfire is reduced across the landscape, risks associated with excessive heating of surface obsidian (Linderman 1992), combustion of built wooden features, and accelerated erosion of site deposits, would likewise decrease.

7. American Indian Traditional Practices

In the long term, implementation of the proposed action may increase the distribution and density of riparian vegetation stands that are important for the practice of Burns Paiute tribal traditions. The proposed action should have no impact on the culturally important root crops in the planning area since such habitats are typically characterized by sparse grass/low shrub fuel models.

D. Proposed Action: Noncritical Elements

1. Soils

Prescribed fire treatments are not expected to have a detrimental effect on the soil resource. Prescribed fire deployment does not result in wide-scale compaction or displacement of soil. Surface erosion could slightly accelerate on burned slopes immediately after ignition of a prescribed burn. However, the mosaic burn pattern that should result from the prescribed fire treatment should provide vegetated buffer areas that would prevent delivery of sediment to streams.

Ground-based mechanized thinning treatments can result in localized compaction or displacement of soil along skidding routes and at the site of large piles.

The risk of surface erosion associated with unvegetated ground in juniper woodlands would be reduced as the density and diversity of understory shrubs and grasses increases.

2. Vegetation

Under the Silvicultural Thinning portion of the proposed action, the influence of encroaching western juniper and ponderosa pine on native plant communities in the planning area would be reduced. Overall species diversity would increase following prescribed fire and mechanical treatments as described in the proposed action.

Removal of overstory conifers by cutting could make more resources (sunlight, water, nutrients) available to residual understory shrubs, grasses, and forbs. Following a lag period of approximately 5 years, a rapid increase in understory cover and density can be expected. Removing a western juniper overstory with mechanized treatments can result in an understory species density that is 10 to 20 times greater than that of untreated areas within 5 years (Bates et al. 2000). Though grasses and forbs typically respond more rapidly to cutting treatments than shrubs (especially sagebrush), reproductive abilities of shrubs may increase following cutting due to increases in available nitrogen.

The broadcast burning activity utilized in the Mountain Big Sagebrush Restoration portion of the proposed action would result in removal of all aboveground portions of understory vegetation from treated areas. Between 40 and 60 percent of mountain big sagebrush/bunchgrass communities in early or intermediate stages of transition to juniper woodland, and between 90 and 100 percent of fully-developed juniper woodlands, would be converted to early successional mountain big sagebrush/bunchgrass communities dominated by perennial grasses and forbs. Approximately 16,000 acres of historic mountain big sagebrush/bunchgrass communities would be burned under this treatment.

A majority of plants present in existing plant communities are adapted to periodic fire and have the capability to respond positively to the disturbance (Miller and Rose 1999). Most plant species associated with mountain big sagebrush communities sprout from subsurface structures. Perennial plants that sprout from belowground structures recover from burning much quicker than those that establish from seed. Studies suggest this treatment, followed by seeding of perennial grass species in some areas, can be expected to result in increases of cover and density of perennial grasses and forbs within a period of two to three growing seasons (Bates et al. 2007). Long term, shrubs that establish from seed would be expected to increase in cover, density, and distribution following treatment (Miller et al. 2001).

Activities that would be utilized under the Low Sagebrush/Bunchgrass Habitat Enhancement Treatment would vary slightly in effects on low and stiff sagebrush plant communities. Broadcast burning low and stiff sagebrush ecological sites is expected to result in a mosaic of fire-killed, lightly burned, and green vegetation as fire is usually unable to thoroughly carry in sparse and discontinuous fuels. Jackpot burning in low sagebrush would result in an even greater level of understory retention. The juniper cut only (no follow-up burning) and single-tree burning activities that may occasionally occur under this treatment would cause mortality to western juniper trees and have no effect on understory shrubs, grasses, or forbs. Jackpot burning would be the activity that is used to treat the vast majority (estimated 90 percent) of acres supporting low and stiff sagebrush plant communities. In general, these activities would serve to reduce the presence of western juniper on approximately 4,800 acres of low sagebrush sites while minimizing effects of fire on shrubs and herbaceous species.

Activities that would be utilized under the Wyoming Big Sagebrush/Bunchgrass Restoration Treatment would reduce the influence of western juniper on the plant community while retaining most shrubland and herbaceous species. Burned acreage would be minimized as would opportunities for establishment or expansion of exotic annual grasses. Between 90 and 100 percent of Wyoming sagebrush dominated plant communities would be converted from early to mid-transitional juniper woodlands to an early transitional Wyoming sagebrush community. Approximately 3,800 acres of historic Wyoming big sagebrush/bunchgrass communities would be burned under this treatment.

The Big Game Browse Maintenance/Deciduous Vegetation Enhancement Treatment would reduce effects of western juniper encroachment on stands of mountain mahogany, bitterbrush, willow, chokecherry, aspen, and other woody riparian species that are at least one-eighth acre in size. It is estimated that this treatment would be applied on less than 3,500 acres. Broadcast burning cut juniper within quaking aspen stands would be expected to kill all dominant and subcanopy juniper trees and stimulate aspen suckering within the remnant stands. Research suggests that burning during the fall season is the most effective method of eliminating juniper and stimulating recruitment within aspen patches in the northern Great Basin (Bates and Miller 2004).

Pile burning, jackpot burning, and conifer cutting within stands of mountain mahogany and bitterbrush shrubs would reduce or eliminate the presence of competing juniper while maintaining the existing understory plant community or minimizing the effects of fire on the understory component. It is anticipated that reducing the presence of western juniper within existing patches of these shrubs would increase their distribution, density, and vigor over a long-term period.

Within the cumulative effects analysis area, effects of prescribed fire and conifer thinning treatments described in the proposed action could be considered cumulative with effects of previous and reasonably foreseeable vegetation management projects within the Upper Malheur River, the Upper Malheur River – Griffin Creek, and the Otis Creek Watersheds (Appendix B - Summary of Past, Present, and Reasonably Foreseeable Actions in the Otis Creek, Upper Malheur River, and Upper Malheur River – Griffin Creek Watersheds and Cumulative Effects Vicinity Map). It is likewise assumed that effects of the treatments would be cumulative with some effects of wildfires documented within the three watersheds (5^{th} level HUCs). The three watersheds that comprise the cumulative effects analysis area encompass 329,529 acres of land administered by the BLM, the State, the USFS, and in private ownership.

The proposed action, in concert with juniper control efforts such as the Three Rivers Otis Mountain Ecosystem Restoration Project (EA-025-99-50) and the Juniper Management Project (EA-025-2000-04), incrementally reduces the influence of western juniper on the 70,000 acres of mountain big sagebrush/bunchgrass, quaking aspen, and mountain mahogany dominated plant communities within the identified cumulative effects analysis area.

Three prescribed fire treatments and 19 juniper cutting treatments have been completed on approximately 8,000 acres of public and private lands within the cumulative effects analysis area between 1989 and 2002. These projects generally converted fully-developed juniper woodlands to early successional shrub or grasslands or shrublands in the earliest stages of transition to juniper woodland.

Five separate wildland fires have burned 5,500 acres within the analysis area between 1994 and 2006. For the most part, the wildland fires converted juniper and ponderosa pine woodlands to shrub bunchgrass communities.

Implementation of the proposed action, in combination with the previous juniper control project and wildland fires that have occurred over the past 20 years, would result in a reduction of juniper encroachment on 25,000 to 27,500 acres of these acres. This represents roughly 42 percent the area classified as mountain big sagebrush/bunchgrass ecological potential in the cumulative effects analysis area.

3. Wildlife

Overall, there is likely to be an increase in wildlife species diversity as a result of the proposed action. The vegetative mosaic created by prescribed burning and mechanical treatments would increase diversity of wildlife habitats. Implementation of the proposed action would interrupt western juniper encroachment, and cause an increase in grasses, forbs, and herbaceous browse species. In addition, existing mountain mahogany, bitterbrush, and aspen stands would be enhanced and maintained as a result of implementing the Big Game Browse/Deciduous Vegetation Enhancement Treatment portion of the proposed action. These treatments would remove much encroaching juniper from these communities, thus causing a likely increase in the health, vigor, and palatability of winter forage for both deer and elk. In areas such as juniper woodlands, the proposed action is expected to increase the quantity of winter forage browse species as well.

Protection and enhancement of mountain mahogany, bitterbrush, and hardwood stands also benefits many other wildlife species. There would be a short-term loss of aspen habitats for big game species until the protective fences are taken down. Although thermal and hiding cover would decrease as a result of the proposed action, there would still be more than sufficient thermal and hiding cover in the treatment areas. Species utilizing more open habitats would be favored as a result of the proposed action. Species favoring juniper woodlands would sustain negative effects under the proposed action.

There are approximately 80,000 acres of elk winter range that exist in the three watersheds that comprise the cumulative effects area of analysis. Implementation of the proposed action in combination with the previous juniper cutting projects and prescribed burns completed on BLM and private lands within the analysis area would result in a reduction of western juniper encroachment and enhancement of favored big game browse species on roughly 19,300 acres of elk winter range in the three watersheds. This represents 24 percent of the total amount of elk winter range in the cumulative effects area. Juniper encroachment on shrubland plant communities has been reduced on an additional 1,000 acres of winter range in the area of analysis that burned during wildland fire events.

4. Livestock Grazing Management

Under the proposed action, a minimum of 2 years of growing season rest would be necessary following prescribed burn treatments in the Moffet Table (#5511), Mule Creek (#5515), Birch Creek (#5516), Otis Mountain (#5517), Big Upson Field (#5519), and Newell Field (#5518) grazing allotments. Alternative forage may be made available to permittees when a pasture or the public portion of an FFR pasture is receiving mandatory rest following a prescribed fire treatment.

In the long term, the quantity and quality of forage would improve within pastures treated with prescribed fire. Forage production following treatment would increase because more soil moisture would be available to herbaceous plants following removal of juniper and shrubs by fire. Livestock would find the increased herbaceous community more favorable for grazing which would improve livestock distribution within treated portions of pastures.

5. Recreation

Under the proposed action, there may be brief minimal impacts to recreational activities in the vicinity of the planning area. Smoke and noise generated during project implementation could disrupt recreational activities in spring or fall seasons. This effect may last for a period of 1 to 3 weeks each year over the life of the project.

In the long term, recreational activities related to big game hunting and wildlife viewing would be enhanced as habitat function improves.

6. Visual Resource Management

Prescribed fire treatments would produce segments of the landscape where the dominant color is black for a year or longer. Juniper skeletons may remain standing and blackened for a period of 20+ years. Mechanical treatments in ponderosa pine forest and woodlands may leave piles of woody debris visible from the Otis Valley Road and Forest Service Road 14 for a period of 2 to 3 years.

In the long term, the aesthetic character of the planning area would improve as views and scenic diversity increase.

7. Social and Economic Values

Under the proposed action, it is estimated that 14 to 15 forestry or prescribed fire jobs would be created in the Harney-Grant County area over a period of 10 years. Revenue received by the agency for forest products or vegetation removed from the Project Area would reduce the cost of project implementation to the government and taxpayers.

The value of livestock grazed in the Project Area would increase as forage productivity improves on public and privately owned lands in the Project Area. Highly productive rangelands in advanced stages of transition to juniper woodland in the Project Area could realize an increase of forage available to livestock that is as much as four times the current production level given typical precipitation patterns.

The proposed action would utilize service contracts to prepare juniper woodlands for broadcast burning and perform small amounts of juniper cutting. The purchase of supplies and equipment necessary for implementation of the proposed action from community merchants would constitute an additional positive economic effect.

Improving the quality of big game hunting in eastern Harney County would have a positive effect the local recreation and tourism industry.

8. Fire Management

Implementation of the proposed action would lower the risk of a large-scale, high severity wildfire event occurring in the planning area. The overall FRCC rating of the planning area would change from a Class 3 to a Class 1 as open early seral shrublands increase across the landscape and closed canopy pine forest and pine woodland stands are treated.

The treatments would reduce the FRCC from a rating of Class 3 to Class 1 or Class 2 in the mountain big sagebrush/bunchgrass stratum. The fire behavior fuel model would change from a model 5-6 (shrub or juniper/shrub fuels) to a model 1-2 (grass-shrub fuels) in the broadcast burn units and a model 5 (shrub-grass fuels). Treatment of the mountain big sagebrush stratum would also result in a 90 percent reduction of the 1-100 hour surface fuels in the treated portions of the 11 downed juniper units within the planning area. Three of the units were ranked as a moderate priority for treatment and one was rated as high priority for treatment under the Cut Juniper Hazard Abatement Project. Fireline intensity and rates of spread for fires that burned within downed juniper units would be reduced as the downed juniper units were treated with surrounding prescribed burn units.

The FRCC rating of the ponderosa pine dominated forest and woodland stratum would decrease from Class 3 to Class 1 as fuel loading is decreased and fuel patterns are less continuous. The fire behavior fuel model would change from a model 9-10 (timber and loosely compacted litter) to a model that resembles fuel model 8 (timber with compact litter). Fire behavior in these areas can be expected to have low rates of spread, low fire intensities, and low flame lengths immediately following fuel treatment.

Pile burning and jackpot burning treatments conducted in the Wyoming big sagebrush/bunchgrass stratum would change the FRCC rating from a Class 3 to a Class 2 under the proposed action. The fire behavior fuel model would change from a model 6 (shrubs with juniper and light grass) to a model 5 (shrub-grass fuels). Fire behavior in the Wyoming big sagebrush stratum post-treatment would be low intensity as shrub litter, grasses, and forbs would be the primary carriers of fire.

Fuels would not be appreciably altered by jackpot burning and conifer cutting on the low sagebrush/bunchgrass stratum. Cutting juniper from 60 to 80 percent of the discrete low sagebrush communities may move the FRCC rating of 2 to a rating of FRCC 1. The fire behavior fuel model would remain a model 2 (grass-shrub fuels) following treatment of the low sagebrush stratum and a model 6 (shrubs with light grasses and litter). Fire behavior would continue to be characterized by low intensity and carried by curing herbaceous fuels.

Cumulatively, fuels treatments in the Otis Mountain/Moffet Table planning would not be sufficient to combine with the effects of fuels management projects on USFS and private lands to alter the FRCC across the landscape of the three watershed cumulative effects analysis area.

9. Forests and Woodlands

Figure 4.1 Ponderosa pine forest stand following a thinning and piling treatment.

Within ponderosa pine woodland areas, stocking of invaded western juniper would decrease to be more in line with historical levels under the proposed action. Sapling and pole sized ponderosa pine stocking would be reduced substantially. The pines that remain would have increased vigor and be more able to withstand natural disturbance processes such as fire and insect attack.

Bitterbrush, bunchgrass, and other upland vegetation would benefit from decreased stocking of trees. Ponderosa pine would exist in a level more characteristic of the historical pine woodland, with scattered large diameter pines and other sizes dispersed through the sagebrush/bunchgrass community.

Within pine dominated forest stands, the proposed action would restore the character of the stands to near their historic condition. The overstory would continue to consist of large diameter ponderosa pines. The character of the understory would substantially change as the basal area would be greatly reduced. Overall stand character would be more open and park-like with clumps of big trees and scattered understory reproduction. Both the overstory and trees that remain in the understory would grow faster and more vigorously and result in better overall stand health (Schmitt and Scott, 2007). All treated stands would be more resilient to natural disturbance processes such as fire, disease, and insect attack. Duff depths would be reduced and with more sunlight and moisture, the ground cover would respond with much greater numbers of herbaceous and grass species. Treatment of Douglas-fir scattered through the stands includes sanitation of mistletoe pockets, reduction of understory and retention of larger diameter trees. Sanitation of dwarf mistletoe pockets would include removal of Douglas-fir where the upper two-thirds of the crown is infected or if the whole tree is infected. Where possible, isolated Douglas-fir trees infected with mistletoe in the lower one-third of the canopy would be retained for wildlife purposes.

10. Lands, Realty, and Roads

The proposed action would substantially reduce the risk of intense wildfires occurring with extreme rates of spread on the planning area, reducing the risk of fire entering private, or National Forest lands by way of land administered by the BLM. Other lands within the planning area and in the general vicinity would have some minor short-term negative effects as a result of implementing the proposed action. These adjacent lands are likely to experience short-term smoke inundations in addition to dust and noise from timber harvesting and thinning operations. Smoke and dust would dissipate within a few days while noise would be limited to the time the operations are ongoing.

Log hauling which has the most potential to damage road systems, is typically accomplished when road surfaces are dry or frozen. In addition, during this phase of the project road maintenance equipment is usually available and onsite so any damage is corrected. However, some project activities such as thinning, piling, and burning do not require heavy equipment and are necessary during late fall, winter, and early spring when narrow windows are available between fire season and deep snow. During these times the road surface and soils may be saturated and unfrozen. In these cases, even light traffic could create ruts, drive arounds and other damage to roads and adjacent soils and vegetation.

E. Council of Environmental Quality Guidance on Cumulative Effects

The analysis of the past actions follows the Council on Environmental Quality guidance provided on June 24, 2005. The CEQ stated in its guidance that "Generally, agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions." Use of information on the effects on past action may be useful in two ways according to the CEQ guidance. One is for consideration of the proposed action's cumulative effects, and secondly as a basis for identifying effects of a proposed action.

Public scoping has not indicated any need to exhaustively list individual past actions, compare, or describe the environmental effects of individual past actions in order to complete a broad-scale cumulative effects analysis for the Otis Mountain/Moffet Table Fuels Management Proposed Action.

Information on past actions is only minimally useful for prediction of direct and indirect effects that could be expected under the Otis Mountain/Moffet Table of Proposed Action. The usefulness of such information is limited by the fact that it is anecdotal only, and extrapolation of data from such singular experiences is not generally accepted as a reliable predictor of effects. The basis for predicting direct and indirect effects of the proposed action is based on published and unpublished research and general accumulated experience of agency resource professionals.

CHAPTER V: CONSULTATION AND COORDINATION

A. Agencies and Individuals Consulted

Actin Ranch, Inc.
Bureau of Land Management: Vale District
Burns Paiute Tribe
Harney County Court
Harney County Soil and Water Conservation District
Malheur County Soil and Water Conservation District
Oregon Department of Fish and Wildlife
Otis Creek Ranch
Seven Federal grazing permittees
Twelve landowners with private inholdings
U.S. Fish and Wildlife Service
U.S. Forest Service: Malheur National Forest, Prairie City Ranger District
U.S. Forest Service: Wallowa-Whitman National Forest, Blue Mountains Pest Management Center

B. Interdisciplinary Team

Lindsay Davies, Fisheries/Aquatic Specialist
Laura Dowlan, Natural Resource Specialist-Recreation
Doug Linn, Fuels Botanist
Nick Miller, Fuels Wildlife Biologist
Tim Newkirk, Forester
Skip Renchler, District Realty Specialist
Lesley Richman, Noxious Weed Specialist
Dan Ridenour, Fuels Planner
Jeff Rose, Fire Ecologist
Don Rotell, Fuels Archaeologist, Interdisciplinary Team Leader
Willie Street, Rangeland Management Specialist

C. Advisory

Jim Buchanan, Supervisory Natural Resource Specialist
Stacy Fenton, Geographic Information System Specialist
Gary Foulkes, District Planning/Environmental Coordinator
Jon Reponen, Forestry and Fuels Team Leader
Dave Toney, Prescribed Fire Implementation Specialist

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Appendix A

Otis Mountain/Moffet Table Fuels Management Project Monitoring Plan

1. Introduction

This monitoring plan describes the activities that the Three Rivers Resource Area staff and Burns Interagency Fire Zone personnel will perform to ensure that prescribed burning and mechanized vegetation treatments conform to project design criteria and meet objectives established in Chapter II of EA OR-06-025-056. The plan guides implementation and effectiveness monitoring through the year 2020 for all burning and mechanical vegetation treatments described in the EA. Implementation monitoring assesses whether a project is implemented as designed while effectiveness monitoring is employed to address questions about the accomplishment of the specific treatment objectives and the long-term effectiveness of project design elements. This monitoring plan satisfies the monitoring needs described in Volume I of the Proposed Three Rivers Resource Management Plan and Final Environmental Impact Statement, as well as the prescribed fire monitoring requirement described in the Interagency Standards for Fire and Fire Aviation Operations 2003 (USDI – USDA).

This plan is not a decision document. If monitoring should determine that treatments outside the scope of the proposed action are necessary, then a separate site-specific environmental analysis and decision document may need to be prepared.

2. Coordination

Since many different resources will be monitored, respective managers and specialists will be involved with various aspects of the monitoring program. Scheduled monitoring visits and data collection will be dependent on treatment objectives, timing of implementation activities, and the responses of specific resources to fire and fire surrogates. For this reason, close and frequent coordination between resource specialists, implementation specialists, and management is essential.

2.1 Roles and Responsibilities

The following is a list of key personnel, and their responsibilities, involved in coordinating and implementing the Otis Mountain/Moffet Table Monitoring Program.

Three Rivers Resource Area Manager

1) Updates the District Fuels Planner and/or Interdisciplinary Team of any significant issues raised by publics or stakeholders pertinent to monitoring program.

Deputy Fire Staff

1) Serves as a liaison between the Burns BLM line officers, State Office and research personnel, and all other agency personnel.

District Fuels Planner

1) Tracks and manages budget for monitoring activities on an annual basis.
2) Works with specialists to develop data collection protocols.
3) Ensures that information is forwarded to appropriate line officers, resource specialists, research personnel, and personnel from other agencies.
4) Works with Interdisciplinary Team (resource specialists).
5) Works with burn supervisors.
6) Works within Fire/Fuels and District organizations to secure critical personnel and resources for monitoring program.

Resource Advisors (Archaeologist, Botanist, Fire Ecologist, Wildlife Biologist, Noxious Weeds, Livestock Grazing, Aquatics, Forestry)

1) Conducts resource-specific implementation and effectiveness monitoring.
2) Maintains monitoring documentation and forwards documentation to the District Fuels Planner if necessary.

Project Prescribed Burn Supervisor

1) Conducts all implementation monitoring associated with prescribed burning that is not conducted by an onsite resource advisor.
2) Ensures monitoring is documented and forwards results to the District Fuels Planner if necessary.

Juniper Pretreatment Contracting Officer's Representative (COR)

1) Conducts all implementation monitoring associated with mechanical juniper pretreatments that are not conducted by an onsite resource advisor.
2) Ensures monitoring is documented and forwards results to the District Fuels Planner if necessary.

Mechanical Treatment COR/Timber Sale Administrator

1) Conducts all implementation monitoring associated with mechanical treatments (pine thinning, juniper cutting) that is not conducted by an onsite resource advisor.
2) Ensures monitoring is documented and forwards results to the District Fuels Planner if necessary.

Allotment Administrator (Range)

1) Conducts implementation monitoring to ensure that the desired post-fire understory vegetation response is achieved.
2) Maintains monitoring documentation and forwards documentation to the District Fuels Planner if necessary.
3) Coordinates and communicates with allotment permittees and adjacent landowners when necessary.
4) Ensures that pastures are rested for appropriate periods following prescribed fire treatments and that alternative forage is secured.
5) Works with burn supervisors and Juniper Pretreatment Project Inspector while planning juniper cut pretreatments, burn plan development, and prescribed fire implementation.

3. Results and Documentation

Monitoring results will be utilized to: 1) document fire and silvicultural thinning effects; 2) evaluate the success or failure of treatments and project design elements; and 3) assess the potential for future treatments and project design elements. Monitoring results and documentation will be maintained by individual resource specialists in paper files, electronic databases, and possibly in a Geographic Information System. Results may also be kept in a prescribed fire project file or tracked with the FIREMON Fire Effects Monitoring and Inventory Protocol Database and Analysis Tools by the District Fuels Planner.

Appendix A – The Otis Mountain/Moffet Table Monitoring Program

Element	Implementation or Effectiveness Monitoring	Objective	Methods	Responsibility	Timing
Noxious Weeds	Effectiveness	Determine if noxious weeds become established in areas of disturbance and control of invasions with herbicide.	Post-treatment surveys. Invasive species identified would be treated with herbicide as described in EA OR-020-98-05.	Noxious Weed Control Specialist	At 1-year intervals for a period of 10 years after implementation
Noxious Weeds	Implementation	Verify that only jackpot burning occurs in stands of Wyoming big sagebrush.	Monitor Rx fire activities.	Rx Burn Supervisor	During Implementation
Noxious Weeds	Implementation	Verify that all vehicles and equipment are cleaned post operation as per Interagency Standards for Fire and Aviation Operations, (Redbook) guidelines.	Apply Interagency Standards for Fire and Aviation Operations, (Redbook) during equipment inspections.	Rx Burn Supervisor, Mechanical Treatment COR	Immediately after implementation throughout the life of the project
Cultural Resources	Implementation	Verify that appropriate project design elements are employed to protect cultural resources are implemented.	Monitor implementation activities such as line construction, prescribed fire ignition, and mop-up with visual observation, photography, and written description.	Archaeologist	During Implementation

Element	Implementation or Effectiveness Monitoring	Objective	Methods	Responsibility	Timing
Cultural Resources	Effectiveness	Evaluate the effectiveness of project design elements at protecting cultural resources.	Conduct monitoring visits at a sample of cultural resources (No more than 10% of total sites in planning area) and compare post-burn conditions to conditions described in cultural resource databases. Possibly conduct preburn vs. post-burn artifact analyses.	Archaeologist	Within 1-year of treatment, with visits every 3 years if necessary
Rangeland	Implementation	Ensure that pastures are rested as per current rangeland standards following burns.	Coordination and communication with allotment permittees.	Allotment Administrator	After implementation of prescribed fire
Fuels Management	Effectiveness	Determine if fuels in treatment units are reduced sufficiently to meet treatment objective	Visually estimated burned areas, delineation with GPS.	District Fuels Planner	After implementation
Fuels Management	Implementation	Determine if weather conditions and prescribed fire parameters are within the range of variability.	Will monitor any site or time specific weather and fire criteria as identified in the project burn plan.	Rx Burn Supervisor	During Implementation
Smoke Plume (Air Quality)	Effectiveness	Determine trajectory and vertical dispersion of smoke plumes.	-Visual observation of smoke plume from ground level. -Assessment of wind speed and direction on day of implementation.	Rx Burn Supervisor	During and immediately after implementation

Element	Implementation or Effectiveness Monitoring	Objective	Methods	Responsibility	Timing
Hazardous Materials	Effectiveness	Ensure that all fuel spills are contained without harm to personnel or the environment.	Immediately control and/or clean spill through use of hazmat spill kit. Report large spill (> 42 gallons) to hazmat coordinator.	Rx Burn Supervisor Mechanical Treatment COR	During implementation
Wildlife Biology – Big Game Cover	Implementation	Determine if 10% of expansion juniper and small diameter pine are retained for cover after implementation.	Visual estimate.	Wildlife Biologist	During and immediately after implementation
Wildlife Biology – Avian	Implementation	Determine if sufficient snags and large downed wood (LWD) remain in treatment units after implementation.	Count LWD and snags per acre in treatment units.	Wildlife Biologist	During and immediately after implementation
Wildlife Biology – SSS	Implementation	- Ensure that structures or areas with SSS habitat value are protected in treatment units. - Ensure that juniper are treated in 2-mile buffer around identified sage-grouse leks.	Monitor activities such as line construction, prescribed fire ignition, and mop-up with visual observation, photography, and written description.	Wildlife Biologist	During and after implementation

Element	Implementation or Effectiveness Monitoring	Objective	Methods	Responsibility	Timing
Fisheries Biology – SSS	Implementation	-Ensure that activities along Bluebucket Creek are limited to precommercial thinning, jackpot burning, and pile burning. -Ensure piles are constructed at least 50 feet from Bluebucket Creek flood plain.	Monitor Silvicultural Thinning Treatment within the Bluebucket Treatment Area.	Aquatics Specialist Mechanical Treatment COR	During and after implementation
Fisheries Biology – SSS	Effectiveness	Ensure that large downed wood in riparian areas is maintained. Cut conifers in stream channel for downed wood recruitment if necessary.	Monitor activities such as line construction, prescribed fire ignition, and mop-up with visual observation, photography, and written description.	Aquatics Specialist	During and after implementation
Aquatics	Effectiveness	Evaluate riparian response to thinning and/or burning.	Conduct greenline monitoring.	Aquatics Specialist	One year prior to treatment to gather baseline data and at 2, 5, and 8 years following treatment.
Vegetation – Juniper Mortality	Effectiveness	Determine if juniper mortality in treatment units meets 70% objective.	Visual estimate.	Rx Burn Supervisor	During implementation and immediately after

Element	Implementation or Effectiveness Monitoring	Objective	Methods	Responsibility	Timing
Vegetation – Mountain Big Sagebrush Restoration Treatment	Effectiveness	Determine if broadcast burn targets of 40-60% in early-intermediate juniper woodlands and 90-100% in late transitional woodlands is attained.	Visual estimate, possibly using GPS delineation or aerial observation.	Resource Advisor	During or immediately after implementation
Vegetation – Low Sagebrush Enhancemet Treatment	Effectiveness	Determine if acreage treatment target of 60-80% in low sagebrush/bunchgrass plant communities is attained.	Visual estimate, possibly using GPS delineation or aerial observation.	Resource Advisor	During or immediately after implementation
Vegetation – Wyoming Sagebrush Juniper Encroachment Treatment	Effectiveness	Determine if acreage treatment target of 90-100% Wyoming/bunchgrass plant communities is attained.	Visual estimate, possibly using GPS delineation or aerial observation.	Resource Advisor	During or immediately after implementation
Vegetation – Mahogany/bitterbrush/and deciduous stands	Effectiveness	Determine if juniper mortality in bitterbrush, mahogany, and deciduous stands meets objectives.	Monitor during implementation, possibly using photography or written description.	Rx Burn Supervisor Mechanical Treatment COR Aquatics Specialist	During or immediately after implementation
Vegetation – Post-fire understory response	Implementation	Ensure that adequate understory seed source is available in prescribed fire treatment units.	Visual estimates, belt transects.	Allotment Administrator	Prior to implementation and/or immediately afterward

Element	Implementation or Effectiveness Monitoring	Objective	Methods	Responsibility	Timing
Vegetation – Bitterbrush Resprout	Effectiveness	Determine resprout success of burned bitterbrush shrubs.	Belt transects.	Wildlife Biologist	Preburn, 1-year following treatment, and at 3-year intervals for 12 years
Forestry	Effectiveness	Determine if canopy closure and canopy base height objectives are attained following mechanical treatment.	Develop tree marking guidelines and monitor unit layout and marking.	Forestry Specialist	During implementation
Roads	Implementation	Ensure roads used during project implementation are returned to a state that is similar to prior condition.	Visual estimates.	Rx Burn Supervisor Mechanical Treatment COR	After implementation

Appendix B

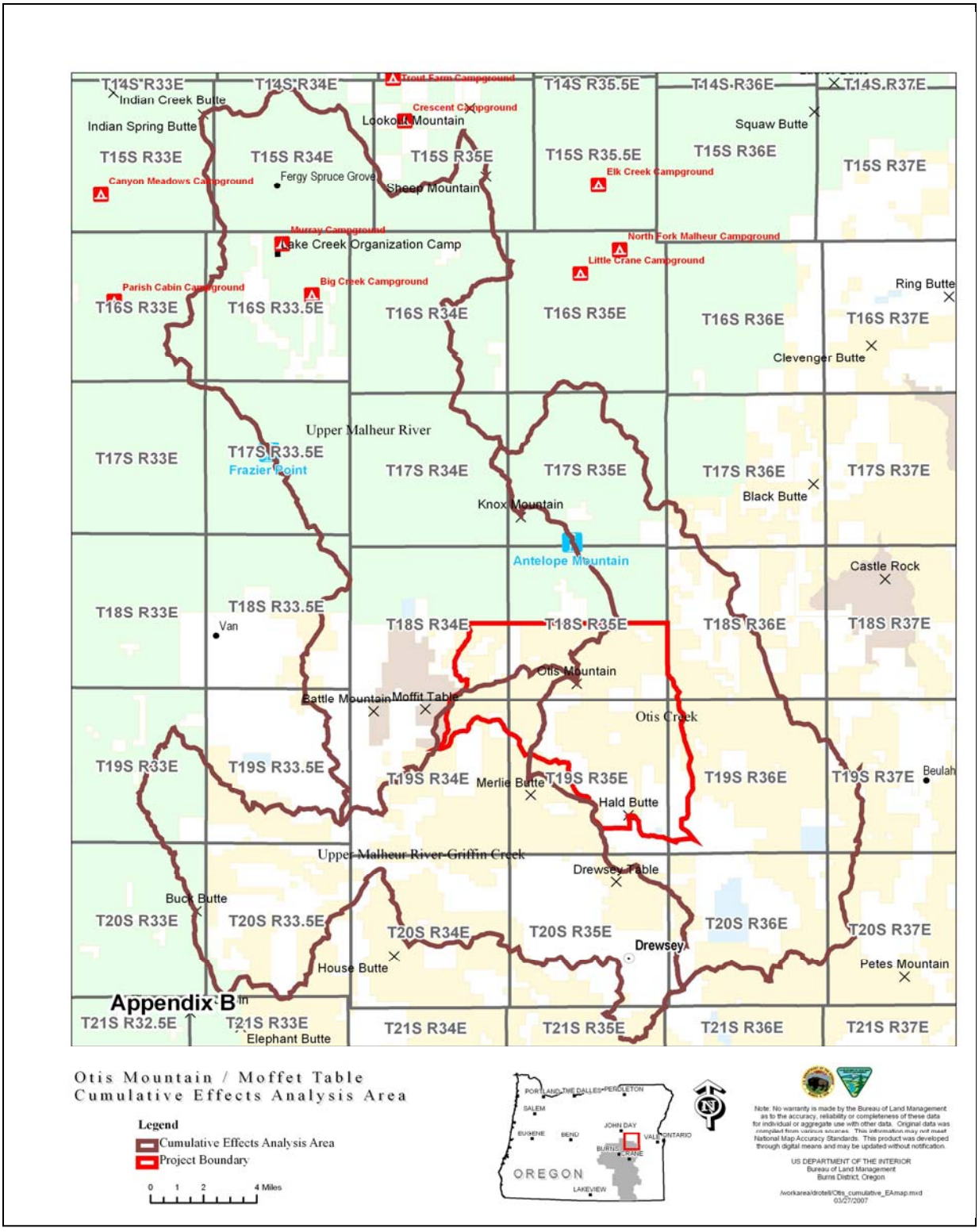
Summary of Past, Present, and Reasonably Foreseeable Actions in the Otis Creek, Upper Malheur River, and Upper Malheur River – Griffin Creek Watersheds and Cumulative Effects Vicinity Map.

Otis Mountain/Moffet Table Cumulative Effects Analysis

Activity/Event	Date Implemented	Watershed	Acres	Plant Community
Eagle-Picher Wildfire	2002	Otis Creek	51	Mountain Big Sagebrush/Wyoming Big Sagebrush
Unnamed Wildfire	1985	Otis Creek	1,490	Wyoming Big Sagebrush/Annual Grasses
McClellen Gulch Wildfire	1996	Otis Creek	497	Mountain Big Sagebrush/Bunchgrass
Cottonwood Wildfire	1998	Otis Creek	57	Mountain Big Sagebrush/Bunchgrass
OR-BUD-2517 Wildfire	2006	Otis Creek	96	Wyoming Big Sagebrush/Annual Grasses
Antelope PCT Units	2004	Otis Creek	221	Ponderosa Pine
North Drewsey PCT Units	2004	Otis Creek	200	Ponderosa Pine
Grabbers PCT Units	2006	Otis Creek	70	Ponderosa Pine
Squaw Creek PCT Units	2003-2004	Otis Creek	101	Ponderosa Pine
Squaw II PCT Units	2003	Otis Creek	27	Ponderosa Pine
Gibby PCT Units/Juniper Cut	2005	Otis Creek	97	Ponderosa Pine
Birch Creek Juniper Cuts	2001	Otis Creek	268	Mountain Big Sagebrush/Bunchgrass/Aspen
Basco Spring Juniper Cut Units	1989	Otis Creek	56	Aspen
Howard Ranch Juniper Cuts		Otis Creek	~1,000	Mountain Big Sagebrush
Otis Mountain Broadcast Burns	2002	Otis Creek	364	Mountain Big Sagebrush

Activity/Event	Date Implemented	Watershed	Acres	Plant Community
VAD BLM Commercial Harvest	1969	Otis Creek	36	Ponderosa Pine
Bluebucket Underburn	2007	Upper Malheur River	410	Ponderosa Pine
Otis Mountain Broadcast Burns	2000, 2002	Upper Malheur River	1,268	Mountain Big Sagebrush/Bunchgrass/Ponderosa Pine
Birch Creek Juniper Cuts	2001	Upper Malheur River	151	Aspen
Jordan Springs Wildfire	1994	Upper Malheur-Griffin Creek	3,238	Ponderosa Pine/Mountain Big Sagebrush
Dunten Juniper Cuts	2007	Upper Malheur River-Griffin Creek	~500	Mountain Big Sagebrush
Basco Spring Juniper Cut Units	1989	Upper Malheur River-Griffin Creek	124	Mountain Big Sagebrush
Merlie Table Juniper Cut Units	2003	Upper Malheur River-Griffin Creek	474	Mountain Big Sagebrush
Mule Creek Juniper Cut Units	2001	Upper Malheur River-Griffin Creek	182	Mountain Big Sagebrush
Coal Mine Juniper Cut	2004	Upper Malheur River-Griffin Creek	216	Mountain Big Sagebrush
Actin Ranch Juniper Cuts		Upper Malheur River	~2,500	Mountain Big Sagebrush
Sword Ranch Juniper Cuts		Upper Malheur River-Griffin Creek	~1,200	Mountain Big Sagebrush
Malheur River Juniper Cut		Upper Malheur River-Griffin Creek	~100	Mountain Big Sagebrush

Appendix B – Otis Mountain/Moffet Table Cumulative Effects Analysis Area



Appendix C – Otis Mountain/Moffet Table Smoke Management Area