SLICKEAR/CLAW CREEK FOREST RESTORATION

ENVIRONMENTAL ASSESSMENT
OR-025-08-017

Bureau of Land Management
Burns District Office
28910 Hwy 20 West
Hines, Oregon 97738

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USDI, Bureau of Land Management
Three Rivers Resource Area, Burns District
Hines, Oregon 97738

FINDING OF NO SIGNIFICANT IMPACT
FOR
SLICKEAR/CLAW CREEK FOREST RESTORATION

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INTRODUCTION:

Burns District Bureau of Land Management (BLM) proposes to implement fuels management and ecosystem restoration treatments within Slickear Creek and Claw Creek Units (collectively referred to as the project area) in Three Rivers Resource Area (RA). Prescribed fire and silvicultural thinning activities would be the primary management tools.

The Slickear/Claw Creek Forest Restoration Project area is made up of two subunits located in Harney County. Slickear Creek Unit (approximately 6,900 acres) and Claw Creek Unit (approximately 4,600 acres) are located approximately 26 miles north-northwest and 43 miles west-northwest of Burns, respectively (Map 1). Slickear Creek Unit is located almost exclusively within Skull Creek Grazing Allotment with elevation ranges from 4,400 to 5,000 feet (T. 20 S., R. 29 E., Sections 31-35, and T. 21 S., R. 29 E., Sections 2-11 and 14-18; Maps 2 and 3). Claw Creek Unit is located almost exclusively within Claw Creek Allotment with elevation ranges from 4,660 to 5,150 feet (T. 21 S., R. 26 E., Sections 12, 13, and 24 and T 21 S., R. 27 E., Sections 7, 8, and 17-20; Maps 4 and 5). The project would be implemented over a 10 to 12-year period.

Rangeland plant communities represented in the project area are dominated by species such as ponderosa pine, western juniper, mountain big sagebrush, low sagebrush, and stiff sagebrush. Other important plant communities occurring in the project area include quaking aspen, mountain mahogany, and bitterbrush.

Due to climate shifts, historic livestock grazing, fire suppression, early logging practices, a shift in land-use practices, and absence of other forest management practices, ponderosa pine and western juniper have expanded and encroached upon important plant communities and are out of balance with historical compositions.

Western juniper (addressed separately from all other conifers in this document) is encroaching upon all plant communities in the project area to various degrees. Between 1870 and 1900, rapid increases in juniper density 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 simultaneous increase in establishment 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 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 expansion of juniper involve introduction of sheep and cattle grazing at the end of the 19th century. Livestock grazing removed or reduced 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.

Exclusion of wildland fire combined with early logging methods have also resulted in overstocked ponderosa pine stand conditions, high levels of forest litter, fuel accumulations, increased ladder fuels, and increased proportions of fire-intolerant trees (Hann et al. 1997; Swetnam et al. 1999). Large-scale wildfires that occur under these conditions can be dangerous, unpredictable events that threaten human life, private property, and cause resource damage.

Forested areas within the project area are overstocked,[1] which has resulted in a reduction of grasses, forbs, and shrubs. Ponderosa pine stands in the project area were historically dominated by large, fire-resistant ponderosa pine. Now, the understory and middlestory of these stands are crowded with fire-intolerant, small-diameter trees and canopies are often in a closed condition. 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 (Agee 1994). The low intensity/high frequency disturbance regime favored development of fire resistant trees such as large ponderosa pine. It also favored development of open stands with scant ladder fuels.

Density and patch size of aspen stands and other riparian species in the project area, have declined due to ponderosa pine and juniper encroachment. In the project area juniper has encroached into many of the stands, but only dominates a small number of aspen sites. Ponderosa pine has encroached upon almost all aspen stands within the project area and is dominating most of them.

Density, patch size, health and vigor of mountain big sagebrush/bunchgrasses, mountain mahogany, and bitterbrush stands are declining as a result of encroaching juniper and pine trees.

[1] *Overstocked:* Having a tree density in excess of the range of historic variability.

Much of the existing mountain big sagebrush/bunchgrass communities are in an early transitional phase to closed western juniper woodlands. Juniper has also encroached into, and in many cases dominates, mountain mahogany and bitterbrush stands. Ponderosa pine has also encroached upon these plant communities. Historically, higher elevation, forest-fringe ecological sites were open shrub-grassland communities supporting only two to five ponderosa pine trees per acre (Munger 1917; Erickson and Conover 1918). Current conditions support an average of 40 or more ponderosa pine trees per acre.

At the lower fringes of this forest type, ponderosa pine and western juniper have encroached meadows and other areas where conifers were not historically prevalent. There is an increasing realization forests and woodlands of the Blue Mountains have evolved with fire and historical conditions were often more resilient and sustainable than the present condition (Langston 1995).

PURPOSE AND NEED FOR ACTION:

The primary purpose of the Proposed Action is to move toward management objectives described in Three Rivers Resource Management Plan (RMP) within Slickear Creek and Claw Creek Units 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 duff and litter accumulations. The emphasis in shrublands, woodlands, and riparian areas would be to move conditions toward historic[2] species composition and structure while reducing fuels in the vicinity of the towns of Burns, Hines, and Riley, as well as numerous ranches, homes, and dwellings. Burns, Hines, and Riley were identified as communities at risk in the Harney County Community Wildfire Protection Plan (CWPP) (2005).

The need for action is western juniper and ponderosa pine have encroached upon important plant communities (as described above) impacting biodiversity, hydrologic cycles, fauna and nutrient cycling. Fuel accumulations have also occurred creating potential for large-scale, high-intensity wildfires threatening human life, property, and natural resources.

<u>Additional Purposes Include</u>:

- Reduce horizontal and vertical fuel continuity and loading of forests and 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 would 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.

[2] **Historic**: Refers to a period prior to 1940 throughout this document.

Project Objectives:

- Reduce surface fuels in forested stands from 7 tons per acre to approximately 3 tons per acre.
- Reduce density of understory trees acting as ladder fuel in forests or woodlands so they are spaced at an average of 22 feet within treated stands.
- Reduce woody fuel loading within western juniper encroached mountain big sagebrush communities in the project area. Reduce 1-hour and 10-hour time lag fuels associated with juniper by a mean total of 90 percent and 100-hour fuels by a mean total of 75 percent in treated areas.

➢ Improve 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 conditions that are more stable, 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 RA.

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 treated 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.

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, and ponderosa pine woodland and forest communities within the project area.

- ➢ Improve 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 juniper and pine 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 RA.

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[3] western juniper density by 90 percent on low sagebrush/bunchgrass ecological sites targeted to improve sage-grouse habitat.
- Increase forage available to big game and other wildlife on BLM-administered 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 Skull Creek and Claw Creek Grazing Allotments.

- ➢ Improve riparian and water quality conditions in the project area. Areas of accelerated erosion and increased sediment delivery into fluvial systems within the project area are occurring due to current road locations and conifer encroachment upon riparian areas.

Supporting RMP Objective: Water Quality 1.1 (RMP, p. 2-4): On a case-by-case basis and after adequate public involvement, close and rehabilitate all roads impacting surface water quality and not needed for administration or fire protection on public lands.

Project Objective:

- Improve water quality by reducing sediment delivery into Claw Creek associated with road use.

[3] **Post-settlement:** A period of time occurring after Euro-American settlement in the region.

Supporting RMP Objective: Soil Management 2 (RMP, p. 2-20): Rehabilitate areas with specific localized soil erosion problems and reduce accelerated (human influenced) sediment delivery to fluvial systems.

Project Objective:

- Reduce or slow erosion within Slickear Creek and Claw Creek Units.

➢ Capture the economic value of those trees that are surplus to resource needs. This would reduce treatment costs incurred by the agency and supply raw materials and jobs that contribute to community stability.

Conformance with Applicable Land Use Plans, Laws, Regulations and Policy

This analysis incorporates and conforms to the Three Rivers Record of Decision/RMP management objectives and also conforms to the following documents, which direct and provide the framework for management of BLM lands within Burns District:

- The National Environmental Policy Act (NEPA) (42 U.S.C. 4321-4347), 1970.
- Federal Land Policy and Management Act (43 U.S.C. 1701), 1976.
- Endangered Species Act (16 U.S.C. 1544), 1973.
- Public Rangelands Improvement Act (43 U.S.C. 1901. 1978).
- Burns District Noxious Weed Management Program Environmental Assessment (EA) (OR-020-98-05) (1998).
- Local Integrated Noxious Weed Control Plan (2004).
- The Greater Sage-grouse Conservation Assessment and Strategy for Oregon: A plan to maintain and enhance populations and habitat (2005).
- The Burns Interagency Fire Zone Fire Management Plan (2004). The project area lies entirely within the Silver and Silvies Fire Management Units.
- Four of the five key points set forth within the National Fire Plan (NFP).[4] Additionally, the proposal responds to the goals of A Collaborative Approach for Reducing Wildfire Risk to Communities and the Environment: 10-year Comprehensive Strategy.[5]

Key points of the NFP are:

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

[4] **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 fire fighting capacity for the future (http://www.fireplan.gov).
[5] http://www.westgov.org/wga/initiatives/fire/final_fire_rpt.pdf

Goals of the NFP 10-Year Comprehensive Strategy:

1. Improve Fire Prevention
2. Reduce Hazardous Fuels
3. Restore fire-adapted ecosystems
4. Promote community assistance

- Harney County 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 2005 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 fuels reduction projects focus on Fire Regime Condition Class 3 (Section 10, Fire Management) 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 and regulations.

SUMMARY OF PROPOSED ACTION:

The proposal is to utilize various methods of prescribed fire and mechanical treatments to accomplish specific objectives to improve forest and rangeland health. The project area treatment proposals are grouped into four dominant vegetative communities: forest areas (ponderosa pine stands), low/stiff sagebrush flats, mountain big sagebrush-bunchgrasses communities, and aspen stands. Mountain mahogany and bitterbrush communities are lumped in as inclusions with the mountain big sagebrush and ponderosa pine plant communities.

In addition to the mechanical and prescribed fire treatments, approximately 0.75-mile of a rough road that meanders through Claw Creek would either be closed or moved to reduce sediment input into the stream channel. This road is currently a rough, two-track road that runs through the creek bed and dead ends due to topographic features. Twenty-one Project Design Elements (PDEs), for protection or maintenance of specific resource values, have been incorporated into the Proposed Action, as the result of specialist recommendations.

<u>Forested Areas Treatment</u>

There are approximately 1,500 acres within the project area dominated by ponderosa pine-bunchgrasses plant communities. These stands have become overstocked due to absence of fire and other management practices. Other important plant communities occurring within these sites include quaking aspen, mountain mahogany, and bitterbrush. Juniper has encroached upon these plant communities. Objectives in these areas are to improve forest health, reduce hazardous fuel loading and risk of sustained crown fires, and to improve wildlife habitat.

To return these stands to a historical ponderosa pine community, it is necessary to reduce surface, ladder, and continuous canopy fuels in stages (Agee 2005). The proposal is to thin overstocked pine stands and remove encroaching juniper. Several untreated islands would be left to provide quality thermal and hiding cover for wildlife. These islands would be determined during onsite project layout. Approximately 70 to 90 percent or 1,050 to 1,350 acres of these communities would be treated. All juniper trees except those displaying old-growth characteristics or obvious wildlife occupation would be cut and piled. Understory and intermediate and co-dominant overstory ponderosa pine trees would be thinned using variable tree spacing creating basal areas ranging from 40 to 120 feet^2/acre. Thinning would retain the largest and best formed trees for overstory retention. If it is determined to be both economically and environmentally feasible, cut conifers could be sold and removed. All slash would be piled either by hand or machine depending on feasibility and resource concerns. All piles would be burned after the vegetation cured (vegetation should cure within 2 years). A prescribed underburn would be conducted 5 to 7 years after mechanical treatments to further reduce ground fuels (litter, twigs, branches <3 inches) in the same stands.

Low/Stiff Sagebrush Flats Treatment

There are approximately 5,700 acres classified as low/stiff sagebrush sites within the project area. Some sites have had some level of juniper encroachment on them. The proposal is to treat some of the low and stiff sagebrush flats encroached upon by juniper. The recommendation to treat the area would be determined by the relative importance of the area for sage-grouse. Areas considered to be suitable for sage-grouse, but currently unsuitable due to juniper encroachment would be given highest priority for treatment. Other areas, such as suitable habitat or probable habitat for sage-grouse, would be determined by the level of juniper encroachment and relative importance. The objectives in these areas are to improve sage-grouse habitat and protect the integrity of the low/stiff sagebrush flats. The proposal in these plant communities is to remove the competitive influence of encroaching juniper. Encroaching juniper trees would be cut and left. Downed juniper may be jackpot burned[6] after the vegetation has cured. This determination would be based upon whether or not downed juniper would create enough fuel buildup to create a potential wildfire hazard. Single-tree burning[7] may occur on a limited basis as an alternative method to cutting.

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[6] ***Jackpot Burning*:** Prescribed burning of concentrations of woody fuels during the late fall, winter or spring, preferably when the ground is partially frozen or wet. This method would burn the fine fuels, limit the ability of the fire to spread and prevent soil sterilization from excessive heat. It is conducive to maintaining the herbaceous plant species growing under the downed junipers. (For more detail see Appendix A - Activity Descriptions.)

[7] ***Single-tree Burning*:** Prescribed burning of individual trees during the late fall, winter or spring, preferably when the ground is partially wet or frozen. This method would burn the fine fuels, limit the ability of the fire to spread and prevent soil sterilization from excessive heat. It is conducive to maintaining the herbaceous plant species growing under the junipers. (For more detail see Appendix A - Activity Descriptions.)

Mountain Big Sagebrush/Bunchgrass Communities Treatment

There are approximately 3,600 acres in the project area classified as mountain big sagebrush-bunchgrass plant communities. Scattered ponderosa pine woodlands, mountain mahogany stands, and bitterbrush stands are intermixed within some of the mountain big sagebrush-bunchgrass plant communities. These plant communities are being encroached upon, and in some cases, dominated by juniper. Pine has also expanded, to a limited degree, outside its historical niche within these communities. The objective in these areas is to restore and enhance existing mountain big sagebrush-bunchgrass, mountain mahogany, bitterbrush, and pine woodland communities, to improve wildlife habitat. The management objective in all these communities is to remove encroaching juniper and pine trees. Approximately 40 to 60 percent of the land area made up of these plant communities would be targeted for treatment. The recommendation to treat a given area would be determined by the level of encroachment and relative importance of the area for big game. The proposal in these plant communities consists of an array of management actions in order to reduce influence of encroaching juniper and pine. The two principal treatments used to treat the majority of these communities would be 1) cutting encroaching juniper followed by jackpot burning after juniper has cured or 2) cutting and piling. In areas where cutting and piling is the preferred method, piles would be moved away from retained desired vegetation to the extent practical. Piling would be done by hand or mechanized equipment (excavator, feller buncher, etc.). Where ponderosa pine has expanded outside its historical niche, understory thinning, ranging from complete removal to a 22-foot spacing, may occur. All piles would be burned after the vegetation cured.

Lesser amounts of prescribed broadcast burning and juniper/pine cutting and leaving may be employed. The cutting and leaving activity would only be used in sparse fuels where it is determined not to be a hazard. In areas targeted for a broadcast burn, the objective is to burn 40 to 60 percent of the mountain big sagebrush-bunchgrass communities in early or mid-transition toward juniper woodlands and 90 to 100 percent of mountain big sagebrush plant communities in late transition toward juniper woodlands. Any remaining encroached juniper may be cut and jackpot burned within treated areas and within areas left unburned by the broadcast prescribed burn. Mountain mahogany and bitterbrush plant communities greater than an acre may receive some form of pre-treatment prior to any broadcast burning. Pre-treatment would primarily consist of cutting and jackpot burning, blacklining, or cutting and pulling cut vegetation away from mountain mahogany and bitterbrush stands, or piling via hand or mechanized equipment, prior to the broadcast burn. The recommendation to perform pre-treatment and type of pre-treatment would be determined by resource advisors during onsite project layout.

Aspen Treatment

There are several aspen stands found within the project area. All aspen stands within the project area are being encroached upon by juniper, ponderosa pine, or both. The proposal in these treatment areas is to remove encroaching vegetation. Mechanical cutting would be the primary tactic used in these communities. Broadcast burning may be utilized in addition to mechanical treatments or as a substitute for mechanical treatments in an effort to cut down on juniper and pine seedling establishment. Ponderosa pine trees less than 10 inches Diameter Breast Height (DBH) would be cut, limbed, and piled. Ponderosa pine trees in the 11 to 19-inches DBH size range may be cut and limbed. Only limbs would be piled on these trees, leaving the bole to serve as downed woody debris. Ponderosa pine trees greater than 19 inches DBH would either be girdled to provide snag habitat, cut, or left onsite. The largest and true old-growth pine trees would be left onsite. If it is determined to be both economically and environmentally feasible, cut conifers could be sold and removed. Junipers, except those showing old-growth characteristics or obvious wildlife occupation, would be cut and piled. Piling in aspens stands would be done by either machine or hand. Piles and downed juniper would be burned after the cut vegetation has cured, and during a time of year that would reduce damage to soils resource and minimize fire spread. Aspen stands could be fenced to protect aspen suckers from browsing animals. The need for fencing would be determined through monitoring. Big game exclosure fences would be built to Burns District BLM standards, which consist of woven wire from ground to at least 7 feet aboveground. If a big game exclosure fence is determined to be needed, it would be removed after new suckers attain a height where the apical bud is 7 feet or higher or above the reach of most grazing animals as determined by monitoring.

Project Design Elements

1. Protect cultural resource values throughout the life of the project. Archaeological inventory of the proposed treatment areas would be completed prior to any mechanical treatments. Archaeological sites may be avoided within mechanical treatment units and activity generated fuels would not be piled within the boundaries of sites. Sites with combustible components would be protected during 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.

2. 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.

3. 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 the Three Rivers Fisheries Biologist would review burn plans prior to project implementation.

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

5. Livestock grazing would not occur for at least two growing seasons in pastures treated with broadcast burning. An additional season of rest from grazing would be necessary prior to a broadcast burn to allow for development of a fine fuel ignition source. Livestock grazing may not occur in pastures receiving other types of treatments including prescribed underburns, jackpot burns, or other treatments that leave the retained vegetation vulnerable. The decision to rest and how long to rest would be determined by post-treatment monitoring of plant response to the various treatments.

6. No downed ponderosa pine logs greater than 15 inches diameter and no snags greater than 15 inches 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.

7. The raking of deep duff around old-growth ponderosa pine trees, large snags, large down woody debris may occur prior to prescribed burning if determined to be necessary to retain them.

8. Maintain suitable big game hiding and thermal cover. Ensure mountain mahogany stands and conifer leave islands continue to function as big game cover following treatments. Retain approximately 10 percent of expansion juniper and young pine stands within the project area to provide cover for mule deer and elk.

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

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

11. Two years of goshawk inventory would be performed prior to any implementation of the Proposed Action.

12. Prior to treatment of prescribed fire and mechanical treatment units, noxious weed populations in the area would be inventoried. Weed populations identified in or adjacent to the project area would be treated using the most appropriate methods in accordance with the Noxious Weed Management Program EA/Decision Record (DR), OR-020-98-05.

13. Risk of noxious weed introduction would be minimized by ensuring all equipment (including all machinery, 4-wheelers, and pickup trucks) is cleaned prior to entry to the site, minimizing disturbance activities, and completing follow-up monitoring, for at least 3 years, to ensure no new noxious weed establishment. Should noxious weeds be found, appropriate control treatments would be performed in conformance with the Noxious Weed Management Program EA/DR, OR-020-98-05.

14. Piles and cut juniper would be jackpot burned when soil moisture is high or under frozen soil conditions to reduce threat of soil sterilization and to maintain the existing shrub and herbaceous plant communities to the extent practical.

15. 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.

16. 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.

17. Any road damaged by vehicles or equipment would be restored to its previous standard including maintaining adequate drainage to provide for resource protection.

18. Dispersed campsites identified within the project area would not be intentionally burned during broadcast burn operations. Protection would be considered for leave islands of sufficient size around identified campsites to protect cultural and recreation values.

19. Limit the amount of mechanized equipment in the riparian area. Landings and piles would be kept out of riparian areas.

20. Prior to beginning operations requiring any fuel tanks or fuel handling at the site, the contractor or BLM would develop and submit to the authorized officer a spill contingency plan.

21. The use of heavy equipment will occur under dry or frozen soil conditions to limit impacts.

22. Should post-treatment monitoring indicate that adverse resource impacts are occurring due to use by motorized vehicles, a temporary closure on use of motorized vehicles in areas being affected, may be utilized.

SUMMARY OF NO ACTION ALTERNATIVE:

Under this alternative, there would be no thinning of forestlands, cutting of encroaching juniper and pine in sagebrush communities or stands of mahogany or aspen, application of prescribed fire, removal or realignment of the road alongside Claw Creek, or temporary protection fencing erected around aspen stands. All other current management, such as livestock grazing, under the No Action Alternative would proceed under the Three Rivers RMP and all other relevant policy direction.

FINDING OF NO SIGNIFICANT IMPACT:

This proposal is in conformance with objectives and land use plan allocations in the 1992 Three Rivers RMP. Based on the analysis of potential environmental impacts contained in the EA and all other information, I have determined that the Proposed Action and alternatives analyzed do not constitute a major Federal action that would significantly impact the quality of the human environment. Therefore, an Environmental Impact Statement (EIS) is not necessary and will not be prepared.

Rationale:

The following critical elements of the human environment have been analyzed in the Three Rivers Proposed RMP/FEIS, and are not known to be present in the project area or affected by enacting either alternative, and therefore, will not be addressed further in this document: Areas of Critical Environmental Concern, Flood Plains, Paleontology, Prime or Unique Farmlands, Hazardous Materials, SSS – Plants, Wilderness, Wilderness Study Areas, and Wild and Scenic Rivers. The following critical element is not discussed in the Three Rivers PRMP/FEIS and would not be affected by the No Action or Proposed Action Alternatives:

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 adverse effects on minority or low-income populations.

Wilderness Characteristics**:** The issue of impacts to potential wilderness characteristics was raised by the Oregon Natural Desert Association (ONDA) for the project area. BLM reviewed the submitted information as part of updating its original wilderness characteristics inventory. Using field knowledge and onsite verification (where necessary), BLM determined that its original inventory finding that no wilderness characteristics exist in the project area remains valid. As such, wilderness characteristics will not be analyzed further in this document. Both the BLM's findings and the ONDA-proposed inventory information are available to the public upon request.

The following critical elements are present and are analyzed in the document: Air Quality, Water Quality/Wetlands and Riparian Zones, Migratory Birds, SSS - Fauna, Noxious Weeds, American Indian Traditional Practices, and Cultural Heritage. Noncritical elements which are present and analyzed in this document are Soils/Biological Soil Crusts (BSCs), Vegetation, Wildlife, Fisheries, Grazing Management, Recreation/Off-Highway Vehicles (OHV), Visual Resources, Economic and Social Values, Forestry/Woodlands, Fire Management, and Transportation/Roads.

This chapter describes affected environmental components not site-specifically described in the Three Rivers PRMP/FEIS and all effects including direct, indirect, and cumulative on resources from enacting the proposed alternatives. A distinction between direct and indirect effects is not made and in many cases cumulative effects are only described as effects. All effects are considered direct and cumulative; therefore, use of these words may not appear. For the purpose of this analysis, the term "short term" refers to a period of time that is equal to or less than 15 years. The term "long term" refers to a period of time that is greater than 15 years.

Air Quality:

Air quality in the areas associated with both Slickear Creek and Claw Creek Units currently meets or exceeds air quality standards outlined by the Oregon Department of Environmental Quality (ODEQ). Due to the long distance from large metropolitan areas and factories, ambient air quality is generally good with few particulates or other pollutants. No area or community in Harney County is considered a nonattainment area for particulate matter meaning it is not in violation of the particulate (PM 2.5) national ambient air quality standard. Impacts on air quality from the proposal 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 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.

Water Quality, Wetlands and Riparian:

The proposed project includes portions of Silver and Silvies subbasins. Riparian conditions were analyzed at the 6th-field Hydrologic Unit Code (HUC)[8] or 6th level subwatershed. There are five, 6th-level HUCs within the project area.

Streams in the project area have been evaluated for water quality impairment as directed by the ODEQ. Egypt Creek, Wickiup Creek, Claw Creek, and Skull Creek are on ODEQ's 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.

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[8] ***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.

Reintroducing and mimicking natural processes excluded from riparian zones (e.g., juniper and other conifer removal and prescribed burns) should result in a positive vegetation response. Prescribed burns would be initiated when conditions are conducive to lower intensity burns, which would reduce potential of losing desired riparian vegetation. In burned areas, most 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 with potential to burn very hot would be pretreated by manual reduction to reduce fuel loads.

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.

Removal of 0.75-mile of road along Claw Creek would improve water quality and riparian condition on Claw Creek. Currently this road is a primary source of excessive sediment found in the stream channel. Removing this portion of the road would trend 0.65-mile of Claw Creek toward Proper Functioning Condition (PFC).

Migratory Birds:

The project area has a variety of plant communities, and thus offers the potential for quality habitat for numerous migratory bird species. Migratory bird species strongly associated with the following habitats are likely to occur or have 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, aspen, and willow also occur within the project area adding to the habitat diversity within the project area. A few migratory bird species of conservation concern for the Great Basin either occur within the project area or potential habitat for these species exists within the project area. These species include golden eagle, Lewis' woodpecker, Williamson's sapsucker, white-headed woodpecker, loggerhead shrike, Brewer's sparrow, and sage sparrow. These species, except 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 not of conservation concern for the Great Basin Region that use the project area for nesting, foraging, and resting.

Direct impacts to migratory birds would be minimized by limiting burning operations and mechanical treatments to the fall and winter seasons where necessary and through PDEs. In the long term, migratory bird species diversity and richness would increase as grasses, forbs, sagebrush, and other shrubs are regenerated by the reintroduction of fire in rangeland ecosystems and the mosaic of habitat types it creates. Enhancing stands of aspen and other hardwood habitats would also benefit populations of migratory birds. In forested areas migratory birds such as cavity nesters that prefer large trees would have improved habitat quality at the stands get healthier producing larger trees in the long term. There would be a reduction in habitat quality for birds that prefer dense understories and those that forage and nest in the small size class conifer trees. However, the overall net effect of the Proposed Action would likely be an increase in habitat diversity and an increase in avian species diversity.

Special Status Species - Fauna:

Terrestrial Species

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 potential to occur as their habitat or potential habitat exists within the project area. These species include greater sage-grouse, northern goshawk, northern pygmy owl, pileated woodpecker, Lewis' woodpecker, Williamson's sapsucker, white-headed woodpecker, pygmy nuthatch, olive-sided flycatcher, loggerhead shrike, Brewer's sparrow, sage sparrow, and several species of bats. Other SSS may occasionally occur within the project area, but their occurrence would be considered rare or infrequent.

Greater sage-grouse (*Centrocercus urophasianus*), an SSS, and their habitat are known to occur within the project area. The Proposed Action is in conformance with the Greater Sage-Grouse Conservation Assessment and Strategy for Oregon. The Proposed Action would have long-term positive effects on sage-grouse, as sagebrush communities are restored to functioning habitats.

Northern goshawks may occur or have potential to occur in the project area. There are no known nest sites in the project area. However, the project area's forested stands and aspen stands have potential to provide suitable nesting habitat for northern goshawks. The proposal should have immediate and long-term positive effects on northern goshawks and their habitat.

Northern pygmy owl, pileated woodpecker, Lewis' woodpecker, Williamson's sapsucker, white-headed woodpecker, and pygmy nuthatch are forest 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 primarily relying upon large dead and dying trees for nesting. The olive-sided flycatcher prefers open forest with an uneven canopy. Northern pygmy owl and pileated woodpecker prefer closed canopies, while Lewis' woodpecker, Williamson's sapsucker, white-headed woodpecker, and pygmy nuthatch prefer more open canopies. All generally prefer a more open understory. The Proposed Action would protect existing snags, large downed woody debris, and old-growth trees and promote recruitment of large trees which should benefit these species in the long term. All these species should benefit from opening of the understory. The Proposed Action would also remove a portion of subdominate and co-dominate trees that make up the forest canopy. This part of the Proposed Action should benefit Lewis' woodpecker, Williamson's sapsucker, white-headed woodpecker, and pygmy nuthatch as they prefer more open canopies. It would negatively affect northern pygmy owl and pileated woodpeckers as they prefer closed canopies. However, the variable nature of forest treatments would ensure 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.

Brewer's sparrow, sage sparrow, and loggerhead shrike 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. 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 decrease habitat for these species as both sagebrush and juniper would be consumed by fire, but it should improve habitat quality for these species in the long term as sagebrush is reestablished.

Several Special Status bat species may also be found within the project area. Bat species typically found in forested habitats primarily depend upon large dead or dying trees for roosting. There has been no documentation of bats species occurring within the project area, but it is likely they occur in the area. Special Status bat species expected to occur in the project area are likely to be not affected in the short term by the Proposed Action. The Proposed Action would protect existing roost trees as well as maintain a suitable prey base. In the long term Special Status bat species may benefit as the Proposed Action would promote larger trees which could potentially become roost trees.

Aquatic Species

Claw and Skull Creeks are the only known fish bearing streams within the project area. These creeks provide habitat for Great Basin redband trout - a Bureau tracking species in Oregon.

This species prefers cold, clear, fast flowing water with clean cobbles and gravels, and spawns during spring. These trout are adapted to dry, hot summers of eastern Oregon and can withstand short periods of time at peak water temperatures of 24 to 27 °C (75 to 80 °F),which would be lethal to most other trout (Bowers et al. 1979). Current population or genetic surveys have not been completed at this time.

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

Reestablishing more natural patterns and processes could 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. Thinning within the riparian zone would accelerate the stand structure toward late successional conditions and reduce the chance of a high severity fire. The existing deciduous 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 are expected. Late season release of cool groundwater is important for fish survival during low flows. Expanding the riparian hardwood community would also positively 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 vegetation within the riparian zone to facilitate expansion of existing deciduous vegetation would improve aquatic habitat and conditions for fish.

Activities proposed along fish bearing streams would have negligible effects to Special Status fish species. No temporary roads would be constructed within riparian zones and mechanical treatments would be limited to hand cutting.

Cut vegetation would be piled and burned outside the flood plain. This would minimize ground disturbance and sediment entering the stream. Prescribed underburns in uplands would be initiated when conditions are conducive to lower intensity burns. A low-intensity burn into 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 temperatures are not expected to increase from the Proposed Action. Field observations indicate topography and channel orientation of the streams in the project area, combined with the expected canopy retention on adjacent hillslopes, would not result in a net loss of effective stream shade.

Fish habitat along Claw Creek is expected to improve following the removal of 0.75-mile of road along the creek. Currently this road is a primary source of excessive sediment found in the stream channel. Removing this portion of the road would trend the 0.65-mile of Claw Creek currently Functioning at Risk toward PFC.

Noxious Weeds:

There would most likely be no increase in populations of noxious weeds, or establishment of new populations, provided that appropriate PDEs are observed. Follow-up treatment 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.

American Indian Traditional Practices:

No American Indian Traditional Practice areas are known to occur in the Claw Creek treatment unit. However, presence of economically important edible plants in the treatment unit suggests it is possible modern use by root gatherers may occur. The Slickear Creek treatment unit is known to contain certain resources (obsidian, edible roots, and big game) important to Burns Paiute Tribe. The treatment unit is in close proximity to Burns Paiute Reservation and is said to be an area where sacred and religious as well as economic activities occur. The Burns Paiute Tribe was consulted regarding the Proposed Action and no concerns were identified. Prescribed fires may have a negative effect on root and other plant gathering activities immediately following the burn (first 2 years) as fire would remove some of this vegetation. However, it is likely these traditional practices would benefit after this initial phase as plants associated with root and plant gathering are expected to reestablish at higher levels after the prescribed burn. Burns Paiute Tribal Council did not comment on the Proposed Action or express a desire to meet with the BLM.

Cultural Heritage:

Cultural surveys will be completed prior to any implementation of the Proposed Action. The Proposed Action would have no known impacts on cultural heritage as cultural sites will be protected throughout the life of the project, either through project design features or total avoidance.

Soils:

Minor increases in soil erosion could occur the first couple of years after the project is implemented. Increases in surface erosion would be short-lived and would likely decrease thereafter as understory vegetation regenerates.

Biological Soil Crusts:

Common BSC likely to be found in the project area are included in the following list of genera: *Byrum, Cladonia, Collema, Lecanora, Peltigera, Psora, and Tortula*. The Proposed Action is likely to either benefit or have a negligible effect on BSC in the project area. Duff reduction in forested systems as well as mosaic burn patterns from prescribed fires in sagebrush dominated communities would allow for soil exposure and establishment of BSCs in areas where opportunity for establishment was lost. BSCs in the project area should also benefit from increased light and moisture as a result of decreased interception (reduced conifer canopy).
Vegetation:

Under the Proposed Action native plant communities would likely be enhanced. Native plant communities (forested and unforested) would benefit from a reduction in overstocked or encroaching conifer species. The aforementioned reduction in interspecific and intraspecific competition coupled with a return to historic mean fire return interval would enhance all native plant communities by increasing the functionality of the overall ecosystem. Overall species diversity would increase. Application of prescribed fire to juniper woodlands developed on historic sagebrush-bunchgrass communities would make more resources (sunlight, water, nitrogen) available to 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 western juniper overstory can result in understory species density that is 10 to 20 times greater than that of untreated areas within 5 years. Forest health and vigor of ponderosa pine stands would be enhanced as well my removing much of the competing vegetation. Understory forbs, grasses, shrubs, and riparian vegetation would likely reestablish and increase to a more historic level. Mountain mahogany, bitterbrush, and aspen communities would be maintained and enhanced as a result of the Proposed Action also.

Wildlife:

Overall, there is likely to be an increase in wildlife species diversity as a result of implementing the Proposed Action. Species utilizing more open habitats would be favored as a result of the Proposed Action. Species favoring juniper woodlands and dense conifer understories would be negatively impacted by the Proposed Action. Foraging opportunities for big game and other herbivores would increase as understory grasses, forbs, and shrubs reestablish. The Proposed Action will likely increase the health, vigor, and palatability of winter forage for both deer and elk. Plant communities wildlife rely upon would likely persist in the event of a wildfire. Thermal and hiding cover would decrease as a result of the Proposed Action, but there would still be more than sufficient thermal and hiding cover in the project area.

Fisheries:

A few reservoirs (Willow and Stateline) within Slickear Creek Unit are stocked by the Oregon Department of Fish and Wildlife with hatchery rainbow trout. Other non Special Status fish species occur within fish bearing streams of the project area. Enacting either alternative would not affect hatchery stocked rainbow trout in the reservoirs. Impacts to non Special Status fish species occurring within fish bearing streams within the project area would be the same as effects to Special Status fish species addressed previously, and will not be separately analyzed in this document.

Grazing Management:

Combinations of treatments proposed for rangeland and forested plant communities would restore plant community diversity and improve watershed and rangeland health. Overstory and understory thinning, piling, and understory prescribed burning proposed for forested areas would release herbaceous species which provide forage for livestock and wildlife. It would increase overall plant diversity within these stands without damaging the older ponderosa pines.

Proposed treatments within rangeland plant communities would restore plant diversity to communities found under a more historic fire regime. All proposed treatments in rangelands should increase available soil moisture and release nutrients, resulting in an increased production of herbaceous and shrub species. An increase in herbaceous species would improve livestock distribution, thereby, reducing concentrations of livestock on any given area, and more uniform utilization patterns may result. The Proposed Action may decrease overall utilization levels as well. The Proposed Action would provide healthy plant communities with adequate forage for species with similar dietary preferences such as cattle and elk.

Implementation of the Proposed Action may require 1 to 3 years of rest from livestock grazing for the two pastures within Skull Creek Allotment and Claw Creek Pasture of Claw Creek Allotment. However, sequences of treatments could be planned which would provide minimal economic impacts to cooperating ranches with continuation of grazing in adjoining pastures in the allotments or would allow them to acquire alternative forage. Growing season rest may be required following jackpot burning to provide for plant recovery.

Recovery time of plant communities from proposed treatments would be less than those that would have to occur if a large-scale, high-intensity wildfire occurred. This is due to the fact that the disturbance from prescribed burning and cutting on plant communities which are beyond the historic fire regime (i.e., have juniper encroachment with a stressed and dead shrub component) is usually far less than disturbance from a wildfire.

Recreation/Off-Highway Vehicles:

Primary recreation activities in the project area are associated with hunting big game, driving for pleasure, hiking, and wildlife viewing. Under the Proposed Action there may be brief minimal impacts to recreational activities in the vicinity of the project area. Smoke and noise generated during project implementation could disrupt recreational activities in the spring or fall seasons. In the long term, recreational activities related to driving for pleasure, big game hunting, and wildlife viewing would be enhanced as habitat function and overall community diversity improves over time.

Economic and Social Values:

The Proposed Action would utilize stewardship or service contracts to reduce biomass in the project area. The purchase of supplies and equipment necessary for implementation of the Proposed Action from community merchants would constitute an additional economic effect. Increased rangeland health would increase forage production for livestock and wildlife thereby increasing economic opportunities and fostering more desirable recreation opportunities. Biomass produced from treatments may be made available for use by alternate energy plants.

Visual Resources:

The project area is remote and not visible from any highway. The entire Claw Creek Unit is classified as a Visual Resource Management (VRM) Class III. Management direction from Three Rivers RMP for a VRM Class III calls for partial retention of the landscape character.

Approximately 60 percent of Slickear Creek Unit is classified as a VRM Class III as well. The remaining 40 percent of Slickear Creek Unit is classified as a VRM Class IV. Management direction from Three Rivers RMP for a VRM Class IV allows for modification of the landscape character. The Proposed Action meets management direction outlined in the Three Rivers RMP for VRM Classes III and IV. Visual resources would be temporarily affected with short-term impacts while treatments are taking place. Upon completion of the project long-term benefits to visual resources should be enhanced as the plant community health and overall diversity in the project area increases.

Forestry/Woodlands:

Under the Proposed Action forest health would be enhanced. Growth and vigor of the retained trees would be enhanced. The risk of disease and insect infestations entering and/or spreading through the stand would decrease as growth, vigor, and overall health of the stand increases. The risk of a stand replacement wildfire occurring in the stands would be greatly reduced.

Fire Management:

All treatments included in the Proposed Action would reduce fuel loading and help lessen the negative effects of wildfire. The Proposed Action would move the Fire Regime Condition Class of many plant communities (mountain big sagebrush, ponderosa pine, mountain mahogany, and aspen communities) in the project area from a Condition Class 3 (high risk of losing key ecosystem components from fire) to a Condition Class 2 or 1 (a moderate to low risk of losing key ecosystem components from fire). The Proposed Action would lower the risk of stand replacement fire in the project area. Overall, following treatment the ponderosa pine stands within the project area should survive any wildfire event.

Transportation/Roads:

After completion of all project activities within a specific area, roads damaged by project vehicles would be maintained and brought back to their previous conditions. Other effects of project activities on transportation may include temporary loss of public access during certain phases of implementation of the Proposed Action such as prescribed burns. There would also be a loss of or realignment of approximately 0.75-mile of a two-track road in Claw Creek Unit. If the road is removed, it should not affect any through traffic transportation, as it is a very rough road that dead ends due to topographic features.

_/*signature on file*/_____ 10/24/2008_____
James Buchanan Date
Three Rivers Resource Area Field Manager

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SLICKEAR CREEK/CLAW CREEK FOREST RESTORATION ENVIRONMENTAL ASSESSMENT

OR-025-08-017

CHAPTER I: INTRODUCTION: PURPOSE OF AND NEED FOR ACTION

A. Background

Burns District Bureau of Land Management (BLM) proposes to implement fuels management and ecosystem restoration treatments within Slickear Creek and Claw Creek Units (collectively referred to as the project area) in Three Rivers Resource Area (RA). Prescribed fire and silvicultural thinning activities would be the primary management tools.

The project area covered in this assessment is located in Harney County. Slickear Creek Unit (approximately 6,900 acres) and Claw Creek Unit (approximately 4,600 acres) are located approximately 26 miles north-northwest and 43 miles west-northwest of Burns, respectively (Map 1). Slickear Creek Unit is located almost exclusively within Skull Creek Grazing Allotment with elevation ranges from 4,400 to 5,000 feet (T. 20 S., R. 29 E., Sections 31-35, and T. 21 S., R. 29 E., Sections 2-11 and 14-18; Maps 2 and 3). Claw Creek Unit is located almost exclusively within Claw Creek Allotment with elevation ranges from 4,660 to 5,150 feet (T. 21 S., R. 26 E., Sections 12, 13, and 24 and T 21 S. R. 27 E., Sections 7, 8, and 17-20; Maps 4 and 5). The project would be implemented over a 10 to 12-year period.

Rangeland plant communities represented in the project area are dominated by species such as ponderosa pine, western juniper, mountain big sagebrush, low sagebrush, and stiff sagebrush. Appendix A shows an inclusive list of scientific names of all plants and animals mentioned in the document. Other important plant communities occurring in the project area include quaking aspen, mountain mahogany, and bitterbrush.

Due to climate shifts, historic livestock grazing, fire suppression, early logging practices, a shift in land-use practices, and absence of other forest management practices, ponderosa pine and western juniper have expanded and encroached upon important plant communities and are out of balance with historical compositions.

Western juniper (addressed separately from all other conifers in this document) is encroaching upon all plant communities in the project area to various degrees.

Between 1870 and 1900, rapid increases in juniper density 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 simultaneous increase in establishment 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 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 expansion of juniper involve the introduction of sheep and cattle grazing at the end of the 19th century. Fire is considered to have been the most important factor limiting conifer encroachment prior to European settlement (Miller et al. 2005). Seasonlong grazing by large numbers of domestic livestock around the turn of the century is believed to have reduced fine fuel loads from the understory of shrubland plant communities, thereby, reducing fire frequency, intensity, and area burned (Burkhardt and Tisdale 1976; Miller and Rose 1999; Miller and Tausch 2001).

Historic grazing practices were far different than what they are today. Current grazing management is designed to maintain or move toward improved upland and riparian/wetland watershed functions, ecological processes, water quality, and habitats to support native, Threatened and Endangered and locally important species. While grazing management has changed over the past century, the project area remains departed from the natural fire regime due primarily from these historical practices and fire suppression. In general, the project area has highly to moderately departed from the natural (historical) regime of vegetation characteristics, fuel composition, and fire frequency, severity and pattern (Appendix E).

Fire suppression also contributed toward the trend of fire exclusion as tactics and technologies advanced over time. This exclusion of wildland fire combined with early logging methods have also resulted in overstocked ponderosa pine stand conditions, high levels of forest litter, fuel accumulations, increased ladder fuels, and increased proportions of fire-intolerant trees (Hann et al. 1997; Swetnam et al. 1999). Large-scale wildfires that occur under these conditions can be dangerous, unpredictable events that threaten human life, private property, and cause resource damage.

Figure 1.2 A representative photo from the project area displaying the overstocked nature of the stand. Note the bark-beetle caused mortality in middle of picture.

Forested areas within the project area are overstocked[1], which has resulted in a reduction of grasses, forbs, and shrubs. Ponderosa pine stands in the project area were historically dominated by large, fire-resistant ponderosa pine. Now, the understory and middlestory of these stands are crowded with fire-intolerant, small-diameter trees and canopies are often in a closed condition. 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 (Agee 1994). The low intensity/high frequency disturbance regime favored development of fire resistant trees such as large ponderosa pine. It also favored development of open stands with scant ladder fuels.

Density and patch size of aspen stands and other riparian species in the project area, have declined due to ponderosa pine and juniper encroachment. A recent study (Wall et al. 2001) of 91 aspen stands in the northwestern Great Basin found three-fourths of stands contained populations of recently established western juniper. Twelve percent of stands were completely replaced by western juniper and 23 percent were dominated by western juniper. In the project area juniper has encroached into many of the stands, but only dominates a small number of aspen sites. Ponderosa pine has encroached upon almost all aspen stands within the project area and is dominating most of them.

Figure 1.3 Pine encroachment upon aspen stands within the project area has already reduced health and vigor. Note the aspen mortality with little to no recruitment.

[1] *Overstocked:* Having a tree density in excess of the range of historic variability.

Figures 1.4 and 1.5 Two more examples of pine encroachment upon aspen stands in the project area. The first picture represents a historic aspen clone that was totally outcompeted and replaced by the encroaching pine trees.

Density, patch size, health and vigor of mountain big sagebrush/bunchgrasses, mountain mahogany, and bitterbrush stands are declining as a result of encroaching juniper and pine trees. Much of the existing mountain big sagebrush/bunchgrass communities are in an early transitional phase to closed western juniper woodlands. Juniper has also encroached into, and in many cases dominates, mountain mahogany and bitterbrush stands. Ponderosa pine has also encroached upon these plant communities. Historically, higher elevation, forest-fringe ecological sites were open shrub-grassland communities supporting only two to five ponderosa pine trees per acre (Munger 1917; Erickson and Conover 1918). Current conditions support an average of 40 or more ponderosa pine trees per acre.

Figure 1.6 An example of a mountain big-sagebrush/bunchgrass community in early stages of transition toward juniper woodlands. The majority of these trees are less than 40 years old.

At the lower fringes of this forest type, ponderosa pine and western juniper have encroached meadows and other areas where conifers were not historically prevalent. There is an increasing realization forests and woodlands of the Blue Mountains have evolved with fire and historical conditions were often more resilient and sustainable than the present condition (Langston 1995).

B. Purpose of and Need for Action

The primary purpose of the Proposed Action is to move toward management objectives described in Three Rivers Resource Management Plan (RMP) within Slickear Creek and Claw Creek Units 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 duff and litter accumulations. The emphasis in shrublands, woodlands, and riparian areas would be to move conditions toward historic[2] species composition and structure while reducing fuels in the vicinity of the towns of Burns, Hines, and Riley, as well as numerous ranches, homes, and dwellings. Burns, Hines, and Riley were identified as communities at risk in the Harney County Community Wildfire Protection Plan (CWPP) (2005).

[2] **Historic**: Refers to a period prior to 1940 throughout this document.

The need for action is western juniper and ponderosa pine have encroached upon important plant communities (as described above) impacting biodiversity, hydrologic cycles, fauna and nutrient cycling. Fuel accumulations have also occurred creating potential for large-scale, high-intensity wildfires threatening human life, property, and natural resources.

Additional Purposes Include:

- Reduce horizontal and vertical fuel continuity and loading of forests and 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 would 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 surface fuels in forested stands from 7 tons per acre to approximately 3 tons per acre.
- Reduce density of understory trees acting as ladder fuel in forests or woodlands so they are spaced at an average of 22 feet within treated stands.
- Reduce woody fuel loading within western juniper encroached mountain big sagebrush communities in the project area. Reduce 1-hour and 10-hour time lag fuels associated with juniper by a mean total of 90 percent and 100-hour fuels by a mean total of 75 percent in treated areas.

- Improve 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 conditions that are more stable, 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 RA.

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 treated 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.

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, and ponderosa pine woodland and forest communities within the project area.

➢ Improve 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 juniper and pine 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 RA.

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[3] western juniper density by 90 percent on low sagebrush/bunchgrass ecological sites targeted to improve sage-grouse habitat.
- Increase forage available to big game and other wildlife on BLM-administered 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.

[3] **Post-settlement:** A period of time occurring after Euro-American settlement in the region.

Project Objective:

- Increase forage available to domestic livestock on lands within Skull Creek and Claw Creek Grazing Allotments.

➢ Improve riparian and water quality conditions in the project area. Areas of accelerated erosion and increased sediment delivery into fluvial systems within the project area are occurring due to current road locations and conifer encroachment upon riparian areas.

Supporting RMP Objective: Water Quality 1.1 (RMP, p. 2-4): On a case-by-case basis and after adequate public involvement, close and rehabilitate all roads impacting surface water quality and not needed for administration or fire protection on public lands.

Project Objective:

- Improve water quality by reducing sediment delivery into Claw Creek associated with road use.

Supporting RMP Objective: Soil Management 2 (RMP, p. 2-20): Rehabilitate areas with specific localized soil erosion problems and reduce accelerated (human influenced) sediment delivery to fluvial systems.

Project Objective:

- Reduce or slow erosion within Slickear Creek and Claw Creek Units.

➢ Capture the economic value of those trees that are surplus to resource needs. This would reduce treatment costs incurred by the agency and supply raw materials and jobs that contribute to community stability.

C. <u>Conformance with Applicable Land Use Plans, Laws, Regulations and Policy</u>

This analysis incorporates and conforms to the Three Rivers Record of Decision/RMP management objectives and also conforms to the following documents, which direct and provide the framework for management of BLM lands within Burns District:

- The National Environmental Policy Act (NEPA) (42 U.S.C. 4321-4347), 1970.
- Federal Land Policy and Management Act (43 U.S.C. 1701), 1976.
- Endangered Species Act (16 U.S.C. 1544), 1973.
- Public Rangelands Improvement Act (43 U.S.C. 1901. 1978).
- Burns District Noxious Weed Management Program Environmental Assessment (EA) (OR-020-98-05) (1998).
- Local Integrated Noxious Weed Control Plan (2004).

- The Greater Sage-grouse Conservation Assessment and Strategy for Oregon: A plan to maintain and enhance populations and habitat (2005).
- The Burns Interagency Fire Zone Fire Management Plan (2004). The project area lies entirely within the Silver and Silvies Fire Management Units (FMUs).
- Four of the five key points set forth within the National Fire Plan (NFP)[4]. Additionally, the proposal responds to the goals of A Collaborative Approach for Reducing Wildfire Risk to Communities and the Environment: 10-year Comprehensive Strategy[5].

Key points of the NFP are:

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

Goals of the NFP 10-Year Comprehensive Strategy:

1. Improve Fire Prevention
2. Reduce Hazardous Fuels
3. Restore fire-adapted ecosystems
4. Promote community assistance

- Harney County 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 2005 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 fuels reduction projects focus on Fire Regime Condition Class (FRCC) 3 (Section 10, Fire Management) 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 and regulations.

D. Decision Factors

These additional decision factors will be relied upon by the decision maker in selecting between the No Action Alternative and the Proposed Action Alternative.

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[4] **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).

[5] http://www.westgov.org/wga/initiatives/fire/final_fire_rpt.pdf

1. Does the alternative achieve project objectives in a manner that considers the health and safety of the public and fire management personnel?
2. Does the alternative achieve project objectives in a manner that is cost-effective?

E. Issues Considered but not Developed Further

Wilderness Characteristics: The issue of impacts to potential wilderness characteristics was raised by the Oregon Natural Desert Association (ONDA) for the project area. BLM reviewed the submitted information as part of updating its original wilderness characteristics inventory. Using field knowledge and onsite verification (where necessary), BLM determined that its original inventory finding that no wilderness characteristics exist in the project area remains valid. As such, wilderness characteristics will not be analyzed further in this document. Both the BLM's findings and the ONDA-proposed inventory information are available to the public upon request.

CHAPTER II: ALTERNATIVES INCLUDING THE PROPOSED ACTION

A. No Action Alternative

Under this alternative, there would be no thinning of forestlands, cutting of encroaching juniper and pine in sagebrush communities or stands of mahogany or aspen, application of prescribed fire, removal or realignment of the road alongside Claw Creek, or temporary protection fencing erected around aspen stands. Conversion of rangelands to juniper woodlands within Slickear Creek and Claw Creek Units would continue. The risk of a high-intensity, crown fire occurrence in the project area would escalate as density and distribution of fuels become increasingly hazardous. All other current management, such as livestock grazing, under the No Action Alternative would proceed under the Three Rivers RMP and all other relevant policy direction.

B. Proposed Action

The Proposed Action was developed by an Interdisciplinary Team (IDT), with representatives from all affected resources. The U.S. Forest Service (USFS) La Grande Forestry and Range Sciences Laboratory's pathologist and entomologist also helped shape the Proposed Action. The pathologist and entomologist's findings from a site visit to the Slickear Creek and Claw Creek Units can be found at the end of this document (Appendices B and C). The proposal is to utilize various methods of prescribed fire and mechanical treatments to accomplish specific objectives described within the purpose and need section. The project area treatment proposals are grouped into four dominant vegetative communities: forest areas (ponderosa pine stands), low/stiff sagebrush flats, mountain big sagebrush-bunchgrasses communities, and aspen stands. Mountain mahogany and bitterbrush communities are lumped in as inclusions with the mountain big sagebrush and ponderosa pine plant communities.

In addition to the mechanical and prescribed fire treatments, approximately 0.75-mile of a rough road that meanders through Claw Creek would either be closed or moved to reduce sediment input into the stream channel. This road is currently a rough, two-track road that runs through the creek bed and dead ends due to topographic features. Twenty-one Project Design Elements, for protection or maintenance of specific resource values, have been incorporated into the Proposed Action, as the result of specialist recommendations. A detailed list of Project Design Elements is presented in Section D of Chapter II (Alternatives Including the Proposed Action). Appendix D provides a more detailed description of the activities and methods that would be utilized under the Proposed Action.

Forested Areas Treatment

There are approximately 1,500 acres within the project area dominated by ponderosa pine-bunchgrasses plant communities. These stands have become overstocked due to absence of fire and other management practices. Other important plant communities occurring within these sites include quaking aspen, mountain mahogany, and bitterbrush. Juniper has encroached upon these plant communities. Objectives in these areas are to improve forest health, reduce hazardous fuel loading and risk of sustained crown fires, and to improve wildlife habitat. To return these stands to a historical ponderosa pine community, it is necessary to reduce surface, ladder, and continuous canopy fuels in stages (Agee 2005). The proposal is to thin overstocked pine stands and remove encroaching juniper. Several untreated islands would be left to provide quality thermal and hiding cover for wildlife. These islands would be determined during onsite project layout. Approximately 70 to 90 percent or 1,050 to 1,350 acres of these communities would be treated. All juniper trees except those displaying old-growth characteristics or obvious wildlife occupation would be cut and piled. Understory and intermediate and co-dominant overstory ponderosa pine trees would be thinned using variable tree spacing creating basal areas ranging from 40 to 120 feet^2/acre. Thinning would retain the largest and best formed trees for overstory retention. If it is determined to be both economically and environmentally feasible, cut conifers could be sold and removed. All slash would be piled either by hand or machine depending on feasibility and resource concerns. All piles would be burned after the vegetation cured (vegetation should cure within 2 years). A prescribed underburn would be conducted 5 to 7 years after mechanical treatments to further reduce ground fuels (litter, twigs, branches <3 inches) in the same stands.

Low/Stiff Sagebrush Flats Treatment

There are approximately 5,700 acres classified as low/stiff sagebrush sites within the project area. Some sites have had some level of juniper encroachment on them. The proposal is to treat some of the low and stiff sagebrush flats encroached upon by juniper. The recommendation to treat the area would be determined by the relative importance of the area for sage-grouse. Areas considered to be suitable for sage-grouse, but currently unsuitable due to juniper encroachment would be given highest priority for treatment. Other areas, such as suitable habitat or probable habitat for sage-grouse, would be determined by the level of juniper encroachment and relative importance. The objectives in these areas are to improve sage-grouse habitat and protect the integrity of the low/stiff sagebrush flats. The proposal in these plant communities is to remove the competitive influence of encroaching juniper. Encroaching juniper trees would be cut and left. Downed juniper may be jackpot burned[6] after the vegetation has cured. This determination would be based upon whether or not downed juniper would create enough fuel buildup to create a potential wildfire hazard. Single-tree burning[7] may occur on a limited basis as an alternative method to cutting.

Mountain Big Sagebrush/Bunchgrass Communities Treatment

There are approximately 3,600 acres in the project area classified as mountain big sagebrush-bunchgrass plant communities. Scattered ponderosa pine woodlands, mountain mahogany stands, and bitterbrush stands are intermixed within some of the mountain big sagebrush-bunchgrass plant communities. These plant communities are being encroached upon, and in some cases, dominated by juniper. Pine has also expanded, to a limited degree, outside its historical niche within these communities.

[6] ***Jackpot Burning*:** Prescribed burning of concentrations of woody fuels during the late fall, winter or spring, preferably when the ground is partially frozen or wet. This method would burn the fine fuels, limit the ability of the fire to spread and prevent soil sterilization from excessive heat. It is conducive to maintaining the herbaceous plant species growing under the downed junipers. (For more detail see Appendix A - Activity Descriptions.)

[7] ***Single-tree Burning*:** Prescribed burning of individual trees during the late fall, winter or spring, preferably when the ground is partially wet or frozen. This method would burn the fine fuels, limit the ability of the fire to spread and prevent soil sterilization from excessive heat. It is conducive to maintaining the herbaceous plant species growing under the junipers. (For more detail see Appendix A - Activity Descriptions.)

The objective in these areas is to restore and enhance existing mountain big sagebrush-bunchgrass, mountain mahogany, bitterbrush, and pine woodland communities, to improve wildlife habitat. The management objective in all these communities is to remove encroaching juniper and pine trees. Approximately 40 to 60 percent of the land area made up of these plant communities would be targeted for treatment. The recommendation to treat a given area would be determined by the level of encroachment and relative importance of the area for big game. The proposal in these plant communities consists of an array of management actions in order to reduce influence of encroaching juniper and pine. The two principal treatments used to treat the majority of these communities would be 1) cutting encroaching juniper followed by jackpot burning after juniper has cured or 2) cutting and piling. In areas where cutting and piling is the preferred method, piles would be moved away from retained desired vegetation to the extent practical. Piling would be done by hand or mechanized equipment (excavator, feller buncher, etc.). Where ponderosa pine has expanded outside its historical niche, understory thinning, ranging from complete removal to a 22-foot spacing, may occur. All piles would be burned after the vegetation cured.

Lesser amounts of prescribed broadcast burning and juniper/pine cutting and leaving may be employed. The cutting and leaving activity would only be used in sparse fuels where it is determined not to be a hazard. In areas targeted for a broadcast burn, the objective is to burn 40 to 60 percent of the mountain big sagebrush-bunchgrass communities in early or mid-transition toward juniper woodlands and 90 to 100 percent of mountain big sagebrush plant communities in late transition toward juniper woodlands. Any remaining encroached juniper may be cut and jackpot burned within treated areas and within areas left unburned by the broadcast prescribed burn. Mountain mahogany and bitterbrush plant communities greater than an acre may receive some form of pre-treatment prior to any broadcast burning. Pre-treatment would primarily consist of cutting and jackpot burning, blacklining, or cutting and pulling cut vegetation away from mountain mahogany and bitterbrush stands, or piling via hand or mechanized equipment, prior to the broadcast burn. The recommendation to perform pre-treatment and type of pre-treatment would be determined by resource advisors during onsite project layout.

Aspen Treatment

There are several aspen stands found within the project area. All aspen stands within the project area are being encroached upon by juniper, ponderosa pine, or both. The proposal in these treatment areas is to remove encroaching vegetation. Mechanical cutting would be the primary tactic used in these communities. Broadcast burning may be utilized in addition to mechanical treatments or as a substitute for mechanical treatments in an effort to cut down on juniper and pine seedling establishment.

Ponderosa pine trees less than 10 inches Diameter Breast Height (DBH) would be cut, limbed, and piled. Ponderosa pine trees in the 11 to 19-inches DBH size range may be cut and limbed. Only limbs would be piled on these trees, leaving the bole to serve as downed woody debris. Ponderosa pine trees greater than 19 inches DBH would either be girdled to provide snag habitat, cut, or left onsite. The largest and true old-growth pine trees would be left onsite. If it is determined to be both economically and environmentally feasible, cut conifers could be sold and removed. Junipers, except those showing old-growth characteristics or obvious wildlife occupation, would be cut and piled. Piling in aspens stands would be done by either machine or hand. Piles and downed juniper would be burned after the cut vegetation has cured, and during a time of year that would reduce damage to soils resource and minimize fire spread. Aspen stands could be fenced to protect aspen suckers from browsing animals. The need for fencing would be determined through monitoring. Big game exclosure fences would be built to Burns District BLM standards, which consist of woven wire from ground to at least 7 feet aboveground. If a big game exclosure fence is determined to be needed, it would be removed after new suckers attain a height where the apical bud is 7 feet or higher or above the reach of most grazing animals as determined by monitoring.

C. Project Design Elements

1. Protect cultural resource values throughout the life of the project. Archaeological inventory of the proposed treatment areas would be completed prior to any mechanical treatments. Archaeological sites may be avoided within mechanical treatment units and activity generated fuels would not be piled within the boundaries of sites. Sites with combustible components would be protected during 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.

2. 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.

3. 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 the Three Rivers Fisheries Biologist would review burn plans prior to project implementation.

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

5. Livestock grazing would not occur for at least two growing seasons in pastures treated with broadcast burning. An additional season of rest from grazing would be necessary prior to a broadcast burn to allow for development of a fine fuel ignition source. Livestock grazing may not occur in pastures receiving other types of treatments including prescribed underburns, jackpot burns, or other treatments that leave the retained vegetation vunerable. The decision to rest and how long to rest would be determined by post-treatment monitoring of plant response to the various treatments.

6. No downed ponderosa pine logs greater than 15 inches diameter and no snags greater than 15 inches 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.

7. The raking of deep duff around old-growth ponderosa pine trees, large snags, large down woody debris may occur prior to prescribed burning if determined to be necessary to retain them.

8. Maintain suitable big game hiding and thermal cover. Ensure mountain mahogany stands and conifer leave islands continue to function as big game cover following treatments. Retain approximately 10 percent of expansion juniper and young pine stands within the project area to provide cover for mule deer and elk.

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

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

11. Two years of goshawk inventory would be performed prior to any implementation of the Proposed Action.

12. Prior to treatment of prescribed fire and mechanical treatment units, noxious weed populations in the area would be inventoried. Weed populations identified in or adjacent to the project area would be treated using the most appropriate methods in accordance with the Noxious Weed Management Program EA/Decision Record (DR), OR-020-98-05.

13. Risk of noxious weed introduction would be minimized by ensuring all equipment (including all machinery, 4-wheelers, and pickup trucks) is cleaned prior to entry to the site, minimizing disturbance activities, and completing follow-up monitoring, for at least 3 years, to ensure no new noxious weed establishment. Should noxious weeds be found, appropriate control treatments would be performed in conformance with the Noxious Weed Management Program EA/DR, OR-020-98-05.

14. Piles and cut juniper would be jackpot burned when soil moisture is high or under frozen soil conditions to reduce threat of soil sterilization and to maintain the existing shrub and herbaceous plant communities to the extent practical.

15. 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.

16. 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.

17. Any road damaged by vehicles or equipment would be restored to its previous standard including maintaining adequate drainage to provide for resource protection.

18. Dispersed campsites identified within the project area would not be intentionally burned during broadcast burn operations. Protection would be considered for leave islands of sufficient size around identified campsites to protect cultural and recreation values.

19. Limit the amount of mechanized equipment in the riparian area. Landings and piles would be kept out of riparian areas.

20. Prior to beginning operations requiring any fuel tanks or fuel handling at the site, the contractor or BLM would develop and submit to the authorized officer a spill contingency plan.

21. The use of heavy equipment will occur under dry or frozen soil conditions to limit impacts.

22. Should post-treatment monitoring indicate that adverse resource impacts are occurring due to use by motorized vehicles, a temporary closure on use of motorized vehicles in areas being affected, may be utilized.

D. Alternatives Considered but Eliminated from Detailed Analysis

Any action alternative to be given serious consideration as a reasonable alternative must: 1) meet the Purpose and Need for Action; 2) be consistent with RMP Objectives; 3) must differ in design; 4) have substantially different effects in which to analyze; 5) be feasible; and 6) its implementation must be realistic. Based on this criterion, no other alternatives were analyzed in detail because all others alternatives considered were-similar in design, the effects would not have been substantially different than what was analyzed, and the Proposed Action provides for flexibility in thinning prescriptions (variable tree spacing creating basal areas between 40 to 120 feet^2/acre), burning prescriptions and types of prescribed fire, and in the actual size of treatments occurring on any given plant community (provides a range of acreage to be treated).

CHAPTER III: DESCRIPTION OF THE AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Slickear Creek/Claw Creek Forest Restoration EA is tiered to the Three Rivers Proposed RMP and Final Environmental Impact Statement (PRMP/FEIS) Analysis (1991).

A general description of the existing environment for Slickear Creek and Claw Creek Units can be found in the Three Rivers PRMP/FEIS. The terrain in the Slickear Creek and Claw Creek Units range from flats to steep canyons. All aspects can be found within the project area. Elevation ranges from 4,400 feet to 5,150 feet in the project area.

The following critical elements of the human environment have been analyzed in the Three Rivers Proposed RMP/FEIS, and are not known to be present in the project area or affected by enacting either alternative, and therefore, will not be addressed further in this document: Areas of Critical Environmental Concern, Flood Plains, Paleontology, Prime or Unique Farmlands, Hazardous Materials, SSS – Plants, Wilderness, Wilderness Study Areas, and Wild and Scenic Rivers. The following critical element is not discussed in the Three Rivers PRMP/FEIS and would not be affected by the No Action or Proposed Action Alternatives:

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 adverse effects on minority or low-income populations.

The following critical elements are present and are analyzed in the document: Air Quality, Water Quality/Wetlands and Riparian Zones, Migratory Birds, SSS - Fauna, Noxious Weeds, American Indian Traditional Practices, and Cultural Heritage. Noncritical elements which are present and analyzed in this document are Soils/Biological Soil Crusts (BSCs), Vegetation, Wildlife, Fisheries, Grazing Management, Recreation/Off-Highway Vehicles (OHV), Visual Resources, Economic and Social Values, Forestry/Woodlands, Fire Management, and Transportation/Roads.

This chapter describes affected environmental components not site-specifically described in the Three Rivers PRMP/FEIS and all effects including direct, indirect, and cumulative on resources from enacting the proposed alternatives. A distinction between direct and indirect effects is not made and in many cases cumulative effects are only described as effects. All effects are considered direct and cumulative; therefore, use of these words may not appear.

For the purpose of this analysis, the term "short term" refers to a period of time that is equal to or less than 15 years. The term "long term" refers to a period of time that is greater than 15 years.

A. Critical Elements

1. Air Quality

Current discussion and analysis of potential effects on air quality resource(s) are tiered to the Three Rivers PRMP/FEIS and relevant information contained in the following section is incorporated into this EA by reference: Section 3-2.

Air Quality: Affected Environment

Air quality in the areas associated with both Slickear Creek and Claw Creek Units currently meets or exceeds air quality standards outlined by the Oregon Department of Environmental Quality (ODEQ). Due to the long distance from large metropolitan areas and factories, ambient air quality is generally good with few particulates or other pollutants. No area or community in Harney County is considered a nonattainment area for particulate matter meaning it is not in violation of the particulate (PM 2.5) national ambient air quality standard. Weather systems move into the project area generally from the west or southwest and exit the project area to the east or northeast. Periods of degraded air quality can occur, though typically these events are short lived, lasting usually only a few hours, and are associated with development of a stable air mass or cold air inversion over the project area. Smoke from wildfires and to a lesser degree prescribed fires are also a cause of degraded air quality due to particulate matter contained in smoke.

Air Quality: Environmental Consequences

No Action Alternative

Under the No Action Alternative no fuel treatments would occur. Fuel loading and associated high-severity wildfire risks would increase with the progression of juniper encroachment and overstocking of ponderosa pine stands in the project area. Occurrence of a high-severity wildfire in the areas during summer months could result in a large amount of low-lying smoke concentrations, as temperature inversions can concentrate smoke at low elevations. Impact to air quality would probably be greater from wildfires as they typically have a longer ignition phase (burn longer), consume more of the burnable biomass, and produce more smoke and particulate matter than prescribed fires. Air quality in the communities of Burns, Hines, Crane, and Riley may be impaired if a wildfire occurs in these areas. These smoke concentrations can have high particulate levels (> PM 2.5) that can cause human health problems.

Proposed Action Alternative

The Proposed Action would produce smoke from prescribed fires, slash pile burning 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, lasting from one to a few days depending on size or number of actual burn units or number of piles to be ignited, with the greatest impact occurring during the actual ignition phase. Residual smoke produced from the burnout of large fuels or slower burning fuel concentrations could occur, lasting for 1 or 2 days following the ignition phase. Impacts to air quality from mechanical treatments would be reduced visibility in the immediate project area, ceasing quickly when such operations stop.

Areas of greatest impact from prescribed fire would be those areas down wind and down drainage from the project area. A wind vector analysis and review of topographic features indicated these areas are typically east, southeast, and northeast of the project area. Amount of impact would be dependant on atmospheric conditions at time of ignition. Prescribed fires are planned and implemented when atmospheric stability and wind conditions promote smoke dispersion into the atmosphere 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 prescribed burn plan would minimize effects of smoke on the communities of Burns, Hines, Crane, and Riley. The areas of greatest impact from mechanical treatments would be within the immediate project area.

2. Water Quality, Wetlands and Riparian

Current discussion and analysis of potential effects on water quality and wetland and riparian resource(s) are tiered to the Three Rivers PRMS/FEIS, and relevant information contained in the following sections is incorporated into this EA by reference: Sections 3-2, 3-3, 3-11, and 3-12.

Water Quality, Wetlands and Riparian: Affected Environment

The proposed project includes portions of Silver and Silvies subbasins. Riparian conditions were analyzed at the 6th-field Hydrologic Unit Code (HUC)[8] or 6th level subwatershed. There are five, 6th-level HUCs within the project area.

Streams in the project area have been evaluated for water quality impairment as directed by the ODEQ. Egypt Creek, Wickiup Creek, Claw Creek, and Skull Creek are on ODEQ's 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.

Upper Claw Creek 6th Field HUC

Claw Creek is the only documented stream in Claw Creek Unit under BLM administration providing habitat for salmonid fish in Upper Claw Creek subwatershed. Approximately 4.3 miles of the creek are within the project area; however, two of these miles are considered ephemeral.

In 2006, a Proper Functioning Condition (PFC) Assessment[9] was conducted along the perennial and intermittent sections of Claw Creek within the project area. The intermittent portion (.65-mile) of Claw Creek was rated as Functioning at Risk (FAR), no trend apparent. The perennial section (1.6 miles) was rated at the high end of PFC. Surveyors noted along the section rated as FAR, excessive sediment deposition was burying vegetation and possibly rerouting the channel.

[8] ***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.

[9] ***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 (FAR) upward or downward trend and nonfunctioning.

The adjacent road on Claw Creek is likely a primary source for excessive sediment seen in the channel. Surveyors noted the reach rated as PFC had high species diversity and was dominated by deep-rooted herbaceous and woody species. The road causing degradation upstream is not present along this reach. The remainder of Claw Creek in the project area is ephemeral and was not surveyed.

Claw Creek is on the 303(d) list as water quality limited for exceeding the 68 ºF temperature standard. Claw Creek is a tributary of Wickiup Creek, which is also listed as water quality limited for exceeding the 68 ºF temperature standard.

Juniper has encroached into the riparian zone and the density of other conifers (Douglas-fir, ponderosa pine) has increased above historic conditions.

Egypt Creek 6th Field HUC

Claw Creek Unit includes 1.3 miles of Egypt Creek, which is depicted as intermittent on the USGS 7.5 minute map (Dry Mountain). A 1998 PFC Assessment rated Egypt Creek as FAR with an upward trend. Surveyors noted vegetative cover was insufficient to protect banks and dissipate energy during high flows. Photo monitoring has since shown deep-rooted herbaceous vegetation is now dominant where surface or subsurface water is present. Much of Egypt Creek in the project area is intermittent to ephemeral. The portion of Egypt Creek within the project area is currently excluded from livestock.

Egypt Creek is on the 303(d) list as water quality limited for exceeding the 68 ºF temperature standard. Egypt Creek is a tributary of Wickiup Creek, which is also listed as water quality limited for exceeding the 68 ºF temperature standard.

Juniper has encroached into the intermittent and ephemeral portions of Egypt Creek.

Skull Creek 6th Field HUC

Skull Creek is the only documented stream in Slickear Creek Unit under BLM administration providing habitat for salmonid fish in Silvies subwatershed. Approximately 3.5 miles of Skull Creek are within the project area. A 1998 PFC Assessment rated Skull Creek as PFC with the exception of a 0.4-mile segment which was considered to be FAR – Upward Trend.

The riparian vegetation resources along Skull Creek in the project area were measured in 2003 using the greenline method (Winward 2000). Greenline stability was ranked high, greenline successional status was rated as late seral, and the cross-section successional status was rated as late seral. Woody species (i.e., willows and other shrubs) were also measured on the greenline. Seedlings, young, and mature plants were well represented with 150 plants in a 0.1-acre area.

Skull Creek is on the 303(d) list as water quality limited for exceeding the 68 ºF temperature standard. Juniper has encroached into the riparian zone and the density of other conifers (Douglas-fir, ponderosa pine) has increased above historic conditions.

Thousand Springs Creek and Yellowjacket Creek 6th Field HUCs

Small portions of these subwatersheds fall within Slickear Creek Unit. Streams within the project boundary on public land are intermittent or ephemeral. No data have been collected in these subwatersheds within the project boundaries.

Water Quality, Wetlands and Riparian: Environmental Consequences

No Action Alternative

Under this alternative, juniper may increase or become established at the edges of or in drier zones of the riparian area. This could decrease riparian vegetation diversity and productivity and function of riparian areas.
Juniper stands tend to have less complex vegetative communities, less understory cover, and more bare soil. 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 deciduous and herbaceous vegetation. Groundwater recharge affects low or late season flows and thus water temperature.

The No Action Alternative would maintain current condition and trend of riparian areas in the short term, unless or until an event such as high severity wildfire or flood occurs. Over time, riparian condition would likely trend downward with consequent negative effects to water quality and riparian zones.

In the forested riparian zones, accelerated growth toward late successional conditions expected from the thinning prescriptions would not occur.

Proposed Action Alternative

Fire was common historically in the riparian zones of dry, low-severity fire regime forests of the Blue Mountains (Olson 2000). Reintroducing and mimicking natural processes excluded from riparian zones (e.g., juniper and other conifer removal and prescribed burns) should result in a positive vegetation response. Prescribed burns would be initiated when conditions are conducive to lower intensity burns, which would reduce potential of losing desired riparian vegetation. In burned areas, most 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 with potential to burn very hot would be prê-treated 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 direct raindrop impact.

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 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.

Removal of 0.75-mile of road along Claw Creek would improve water quality and riparian condition on Claw Creek. Currently this road is a primary source of excessive sediment found in the stream channel. Removing this portion of the road would trend 0.65-mile of Claw Creek toward PFC.

Concurrent actions within the project area include livestock grazing. Livestock grazing would be managed to provide for upward trend in riparian condition, by manipulating the timing of grazing and rest periods, which would minimize any negative cumulative effects. Treatment areas would be rested a minimum of two growing seasons following a broadcast burn and up to two growing seasons following a jackpot burn. Duration of the rest cycle would be determined by rangeland monitoring. Due to landscape-scale treatments, cumulative effects from wild ungulates would be minimal. Treatments would occur across a large area in order to disperse use from wild ungulates.

3. Migratory Birds

Current discussion and analysis of potential effects on migratory bird resource(s) are tiered to the Three Rivers PRMP/FEIS, and relevant information contained in the following sections is incorporated into this EA by reference: Sections 3-9, 3-10, and 3-11.

Migratory Birds: Affected Environment

The project area has a variety of plant communities, and thus offers the potential for quality habitat for numerous migratory bird species. Migratory bird species strongly associated with the following habitats are likely to occur or have 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, aspen, and willow also occur within the project area adding to the habitat diversity within the project area. A few migratory bird species of conservation concern for the Great Basin either occur within the project area or potential habitat for these species exists within the project area.

These species include golden eagle, Lewis' woodpecker, Williamson's sapsucker, white-headed woodpecker, loggerhead shrike, Brewer's sparrow, and sage sparrow. These species, except 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 not of conservation concern for the Great Basin Region that use the project area for nesting, foraging, and resting.

Migratory Birds: Environmental Consequences

No Action Alternative

Under the No Action Alternative, no disturbance to migratory birds would occur due to human activity. Rangeland plant communities would continue to transition toward juniper woodlands while stocking of ponderosa pine forests would increase. When western juniper density and cover increase to the point 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 likely 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 relatively few species, such as the gray and dusky flycatchers, which 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 would be a decrease in structural and vegetative diversity, and thus, a decrease in avian species diversity.

Proposed Action Alternative

Effects on migratory birds would depend on treatment and vegetation being treated. The overall net effect of the Proposed Action would likely be an increase in habitat and structural diversity, and thus, 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. This would help reduce the amount of disturbance to migratory birds during breeding, nesting, and fledging seasons. The Proposed Action is likely to have little or no effect on golden eagles.

Forested Areas

In forested areas the Proposed Action would open up stands allowing grasses, forbs, and shrubs to regenerate. Opening of stands would also increase health and vigor of retained trees, thus promoting growth of larger trees. Snags and downed woody debris habitat are also likely to be maintained or increased as a result of the Proposed Action. All of the above would increase vegetative species and habitat diversity, which would likely increase avian diversity and richness. Cavity nesters and other birds that utilize snags and larger trees should have an increase in habitat quantity and quality as a result of the Proposed Action. Other avian species that favor open stands would also see an increase in habitat quality and quantity as well. There would be a reduction in habitat quality for birds that prefer dense conifer understories and a high level of canopy closure. However, areas of dense conifer understories with high levels of canopy closure would remain in the project area as not all forested sites would be treated. Overall, the net effect of the Proposed Action in forested areas would likely promote an increase in avian species diversity in the future.

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 are relatively low. Use of prescribed fire or mechanical cutting in these areas would 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 are likely to increase. These actions would reduce habitat quality and quantity for species that prefer woodland habitat, such as gray and dusky flycatchers. Birds nesting in cavities in large western juniper would be minimally affected as large juniper trees are generally fire resistant, and would not be targeted by mechanical treatments. There would also be areas left as No Action areas that support large, old-growth juniper trees. This would further ensure cavity nesting habitat would remain after treatments.

In areas where juniper is in an intermediate stage of transition to woodlands, migratory bird diversity and richness are relatively high. The Proposed Action is to use mechanical or prescribed broadcast fire to create a mosaic where 40 to 60 percent of the area is treated. Follow-up cutting to remove juniper in areas unburned may take place, but not through the entire unit. A mosaic burn would provide a diversity of habitats, including early succession plant communities as well as retained areas of juniper in an intermediate stage of transition to woodlands. Diversity of habitats created by these mosaic burns would likely increase avian species diversity. Birds nesting in cavities in large western juniper would be minimally affected as large juniper trees are generally fire resistant, and would not be targeted by mechanical treatments.

Mountain Mahogany, Aspen Stands, and Riparian Plant Communities

Migratory bird species which utilize mountain mahogany, quaking aspen stands, and riparian plant communities, would likely be favored as the Proposed Action would protect and enhance these vegetative communities. This would be beneficial because migratory bird diversity and richness are very high in aspen stands and riparian plant communities. Removal of juniper and other conifers from these communities would increase health and vigor of stands, likely stimulating regeneration and recruitment of younger trees. Fencing of aspen stands would provide protection of young and regenerating trees from browsing animals, further promoting regeneration of stands. Protection and enhancement of these communities would ensure long-term availability of these habitats for migratory birds in the future. The net effect of the Proposed Action would likely promote an increase in avian species diversity in the future.

4. Special Status Species – Fauna

Current discussion and analysis of potential effects on SSS – fauna resource(s) are tiered to the Three Rivers PRMP/FEIS and relevant information contained in the following section is incorporated into this EA by reference: Sections 3-9.

Special Status Species – Fauna: Affected Environment

Terrestrial Species

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 potential to occur as their habitat or potential habitat exists within the project area. These species include greater sage-grouse, northern goshawk, northern pygmy owl, pileated woodpecker, Lewis' woodpecker, Williamson's sapsucker, white-headed woodpecker, pygmy nuthatch, olive-sided flycatcher, loggerhead shrike, Brewer's sparrow, sage sparrow, 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 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 use of those habitats with specific areas 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 are no known leks within the project area. The nearest known lek is Claw Creek lek, just over 2 miles south-southwest of Claw Creek Unit. The nearest known lek to Slickear Creek Unit is Hay Creek complex of two leks, approximately 3 miles north-northwest.

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 pre-nesting period for hens, areas rich in forbs are important. 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 their diet and remains so until spring.

Mountain big and low/stiff sagebrush communities in the project area have potential to provide quality habitat for sage-grouse throughout much of the year. Most mountain big sagebrush communities and low/stiff sagebrush communities are classified as probable habitat, context unknown. A portion of these communities are considered historical habitat but currently unsuitable due to juniper encroachment. These are areas where mountain big sage/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 under the broad classifications of probable habitat, context unknown, is experiencing juniper and ponderosa pine encroachment as well. These areas experiencing juniper or pine encroachment are already, or would be, considered historical habitat, but currently unsuitable for sage-grouse, if nothing is done to control encroaching juniper and pine.

Northern goshawks may occur or have potential to occur in the project area. There are no known nest sites in the project area. However, the project area's forested stands and aspen stands have potential to provide suitable nesting habitat for northern goshawks. Two years of goshawk inventory would be performed prior to any implementation of the Proposed Action.

Northern pygmy owl, pileated woodpecker, Lewis’ woodpecker, Williamson's sapsucker, white-headed woodpecker, and pygmy nuthatch are forest 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 primarily relying upon large dead and dying trees for nesting. Northern pygmy owl and pileated woodpecker prefer closed canopies, while Lewis’ 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 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. Bat species typically found in forested habitats primarily depend upon large dead or dying trees for roosting. There has been no documentation of bats species occurring within the project area, but it is likely they occur in the area.

Aquatic Species

Claw and Skull Creeks are the only known fish bearing streams within the project area. These creeks provide habitat for Great Basin redband trout - a Bureau tracking species in Oregon. This species prefers cold, clear, fast flowing water with clean cobbles and gravels, and spawns during spring. These trout are adapted to dry, hot summers of eastern Oregon and can withstand short periods of time at peak water temperatures of 24 to 27 °C (75 to 80 °F),which would be lethal to most other trout (Bowers et al. 1979). Current population or genetic surveys have not been completed at this time.

Special Status Species – Fauna: Environmental Consequences

No Action Alternative-*Terrestrial Species*

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, northern pygmy owl, pileated woodpecker, Lewis' woodpecker, Williamson's sapsucker, white-headed woodpecker, pygmy nuthatch, olive-sided flycatcher, loggerhead shrike, Brewer's sparrow, sage sparrow, and several species of bats 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, currently nonfunctional under the influence of juniper or pine encroachment, would remain in existing conditions. As juniper and pine encroachment progresses, areas 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 advancement of juniper and pine encroachment under this alternative.

Potential goshawk nesting habitat would continue to be encroached upon by juniper and overstocked by reproduction 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 associated with forested sites. These include Lewis' 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 large-scale, high-intensity wildfire occurred, there could be major impacts on habitats these species are currently using.

The No Action Alternative would increase canopy closure favoring the northern pygmy owl and pileated woodpeckers. 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 they prefer.

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.

No Action Alternative-*Aquatic Species*

Under the No Action Alternative, fuel loads would not be reduced across the project area. Current condition and trend would be maintained, until a wildfire event. During the past century, fire suppression and timber harvests have altered fuel loads and forest structure in the dry forest communities of the project area. Because of this, the probability of large, stand-replacing fires has increased in those areas. Changing fire regimes and 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 continued expansion of conifers. Juniper dominance on a site has been shown to decrease shrub and herbaceous vegetation cover (Roberts and Jones 2000). With this loss, soil is more prone to increased soil crusting, decreased infiltration and increased erosion (Pierson et al. 1994). Under the No Action Alternative, increased runoff and erosion from surrounding hillsides are likely to occur, causing chronic sediment delivery to stream channels. Chronic sediment inputs reduce spawning habitat and reproductive success of fish by smothering eggs or trapping newly-hatched fish in the gravels below the streambed surface.

Elevated sediment also reduces available habitat for both fish and macroinvertebrates (which are an important food source for fish). Increased sediment reduces pool habitat, which is important for cover, over-wintering habitat, and thermal refuges during temperature extremes.

Proposed Action Alternative-*Terrestrial Species*

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, northern pygmy owl, pileated woodpecker, Lewis' 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. Mechanical treatments and prescribed fire would remove 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 mechanical treatments, especially nesting habitat in big sagebrush communities and brood rearing in low sagebrush communities. Some of the early to mid-transitional mountain big sagebrush sites may be broadcast burned. Broadcast burning would remove juniper as well as the shrubby and herbaceous understory. Nesting and wintering habitat for sage-grouse would come back in the long term 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, mountain big sagebrush and low and stiff sagebrush sites currently considered to be unsuitable for sage-grouse due to juniper encroachment would likely become functional sage-grouse habitat if they receive treatments outlined in the Proposed Action.

Some areas classified as sage-grouse habitat or probable sage-grouse habitat, context unknown, are proposed to receive mechanical or prescribed fire treatments. Areas within these habitat types proposed for treatment are places where juniper has already 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 may eventually cease to function as habitat. Broadcast burn treatments in these areas would likely displace sage-grouse during much of the year in the short term, but in the long term would improve habitat as mountain big sagebrush/bunchgrass communities reestablish in burned areas. Sage-grouse may benefit nutritionally in the short term by the flush of forbs expected to occur after burning. Mechanical and single tree burning treatments in 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 found within or adjacent to the project area. Should a nest site be discovered, a Project Design Element would be in place to protect both the birds and nesting habitat. If goshawks are found within the project area, effects 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 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 northern pygmy owl, pileated woodpecker, Lewis' 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, and old-growth trees and promote recruitment of large trees which should benefit these species in the long term. All these species should benefit from opening of the understory. The Proposed Action would also remove a portion of subdominate and co-dominate trees that make up the forest canopy. This part of the Proposed Action should benefit Lewis' woodpecker, Williamson's sapsucker, white-headed woodpecker, and pygmy nuthatch as they prefer more open canopies. It would negatively affect northern pygmy owl and pileated woodpeckers as they prefer closed canopies. However, the variable nature of forest treatments would ensure 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 decrease habitat for these species as both sagebrush and juniper would be consumed by fire, but it should improve habitat quality for these species in the long term as sagebrush is reestablished.

Special Status bat species expected to occur in the project area are likely to be not affected in the short term by the Proposed Action. The Proposed Action would protect existing roost trees as well as maintain a suitable prey base. In the long term Special Status bat species may benefit as the Proposed Action would promote larger trees which could potentially become roost trees.

Proposed Action Alternative-*Aquatic Species*

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

Reestablishing more natural patterns and processes could 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.

Thinning within the riparian zone would accelerate the stand structure toward late successional conditions and reduce the chance of a high severity fire. The existing deciduous 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 are expected. Late season release of cool groundwater is important for fish survival during low flows. Expanding the riparian hardwood community would also positively 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 vegetation within the riparian zone to facilitate expansion of existing deciduous vegetation would improve aquatic habitat and conditions for fish.

Activities proposed along fish bearing streams would have negligible effects to Special Status fish species. No temporary roads would be constructed within riparian zones and mechanical treatments would be limited to hand cutting.

Cut vegetation would be piled and burned outside the flood plain. This would minimize ground disturbance and sediment entering the stream. Prescribed underburns in uplands would be initiated when conditions are conducive to lower intensity burns. A low-intensity burn into 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 temperatures are not expected to increase from the Proposed Action. Field observations indicate topography and channel orientation of the streams in the project area, combined with the expected canopy retention on adjacent hillslopes, would not result in a net loss of effective stream shade.

Fish habitat along Claw Creek is expected to improve following removal of 0.75-mile of road along the creek. Currently this road is a primary source of excessive sediment found in the stream channel. Removing this portion of the road would trend the 0.65-mile of Claw Creek currently FAR toward PFC.

5. Noxious Weeds

Current discussion and analysis of potential effects on noxious weeds are tiered to the Three Rivers PRMP/FEIS and relevant information contained in the following section is incorporated into this EA by reference: Sections 3-7.

Noxious Weeds: Affected Environment

Claw Creek Unit is essentially weed-free. There are a few small incidental thistles (<5acres total) within the boundary but nothing noteworthy.

There are currently four documented and recorded noxious weed sites within Skull Creek Allotment. However, three of these recorded sites occur on the portion of Skull Creek outside the project area boundary. A 0.177-acre infestation of Russian knapweed occurs in Lake Creek Pasture within the project area boundary. Other acres of recorded noxious weed infestations occurring in the allotment outside the project area are medusahead rye (2.22 acres) in Early Turnout Pasture, bull thistle (0.0008-acre) in Campbell Place Pasture, and Dalmatian toadflax (1.868 acres) in Willow Flat Pasture.

In addition, there were several infestations discovered and treated in 2007 that have not yet been entered into our Geographical Information System database. These consisted of approximately 1-acre of whitetop with some bull thistles scattered along Skull Creek Road and a 2-acre site of diffuse knapweed in Early Turnout Pasture near a small reservoir.

There have been some systematic weed inventories conducted in the proposed project area, mostly associated with the road network and prior fuels management projects (described under Section C of this Chapter). There would be botanical surveys conducted prior to implementation of this new proposed project. If noxious weeds are identified, appropriate weed treatments should occur prior to initiating work on this project.

There are a number of other known noxious weed sites in relatively close proximity to Slickear Creek Unit. Species include Canada thistle, bull thistle, whitetop, Russian knapweed, and Dalmatian toadflax. They occur primarily along roads and have mostly been treated on a regular basis.

There are a number of frequently traveled roads within Slickear Creek Unit. This area is quite close to town and receives a lot of traffic. Roads are a continual source of new weed introductions and must be monitored regularly to ensure early detection of new weed populations. If weeds are found, sites should be treated promptly to minimize spread.

Noxious Weeds: Environmental Consequences

<u>No Action Alternative</u>

Risk of noxious weed establishment and spread would increase under the No Action Alternative as woodlands continue to degrade, creating niches for noxious weed invasion, and by accumulation of fuels increasing the likelihood of a large-scale wildfire.

Sagebrush-bunchgrass plant communities would continue to progress toward juniper woodlands. Wildfires that occur in these communities tend to be severe enough to kill a high percentage (>60 percent) of understory plants. These conditions are highly susceptible to noxious weed invasion.

Proposed Action Alternative

Overstocked, declining woodlands, including areas with encroaching stands of juniper have the ability to outcompete other, desirable native vegetation creating new niches that can be occupied by noxious weeds. Management actions which promote healthy woodlands as described under the Proposed Action for this project, including reducing the threat of large-scale, high-intensity wildfires, would help counteract this effect.

Initially, mechanical treatments and use of prescribed fire could open up areas for weed colonization by creating disturbed habitat favoring noxious weed invasion. However, an aggressive survey and treatment protocol by the BLM would help address newly invading noxious weeds before they can become established.

There would be minimal increases in the risk of introduction of new weed populations or the expansion of existing weed populations as a result of implementing the Proposed Action if the Project Design Elements are followed. Monitoring for noxious weeds would occur for 3 years post-treatment and any weeds attempting to establish would be treated using an integrated weed management approach, as outlined in the District's Noxious Weed Management EA.

6. American Indian Traditional Practices

Current discussion and analysis of potential effects on American Indian Traditional Practices are tiered to the Three Rivers PRMP/FEIS, and relevant information contained in the following section is incorporated into this EA by reference: Sections 3-21.

American Indian Traditional Practices: Affected Environment

Claw Creek Unit: No American Indian Traditional Practice areas are known to occur in this treatment unit. However, presence of economically important edible plants in the treatment unit suggests it is possible modern use by root gatherers may occur.

Slickear Unit: This treatment unit is known to contain certain resources (obsidian, edible roots, and big game) important to Burns Paiute Tribe. The treatment unit is in close proximity to Burns Paiute Reservation and is said to be an area where sacred and religious as well as economic activities occur.

Consultation with Burns Paiute Tribal Council was initiated in January of 2008 with a scoping letter and a request to meet with the Council about the project. No response was received from the tribe.

American Indian Traditional Practices: Environmental Consequences

No Action Alternative

Traditional practices within the project area are not likely to be affected by the No Action Alternative.

Proposed Action Alternative

Traditional practice areas, particularly within Slickear Creek Unit, are likely to be affected by the Proposed Action as religious or sacred activities associated with ancestors, hunting marmots, big game, personal use, obsidian, root gathering, and gathering other plant materials for personal use are some of the likely traditional practices occurring within this unit.

Because no specific locations of American Indian Traditional Practices are known within Slickear Creek Unit, it is problematic to analyze effects of the Proposed Action on those activities. However, prescribed fires may have a negative effect on root and other plant gathering activities immediately following the burn (first 2 years) as fire would remove some of this vegetation. However, it is likely these traditional practices would benefit after this initial phase as plants associated with root and plant gathering are expected to reestablish at higher levels after the prescribed burn. Burns Paiute Tribal Council did not comment on the Proposed Action or express a desire to meet with the BLM.

7. Cultural Heritage

Current discussion and analysis of potential effects on cultural resources are tiered to the Three Rivers PRMP/FEIS, and relevant information contained in the following section is incorporated into this EA by reference: Sections 3-21.

Cultural Heritage: Affected Environment

Claw Creek Unit: Only 75 acres of cultural resource inventory and survey have been completed in this unit prior to this project proposal. No archaeological sites were inventoried during this survey. This unit contains uplands with low/stiff sagebrush plant communities with edible root plants important to prehistoric and modern American Indian communities. The probability for finding cultural properties eligible for the National Register in the unit is high. Landforms associated with ecotones between low/stiff sagebrush flats and historic juniper/pine populations and landforms adjacent to live water sources are the most likely places to find cultural properties.

Slickear Creek Unit: Only 107 acres of cultural resource inventory and survey have been completed in this unit prior to this project proposal. The majority of this survey was completed for the Strategic Fuel Breaks Project in 2003. Seven prehistoric archaeological sites are known to occur in the unit. All appear to be associated to some degree with occurrence of abundant obsidian sources. Other landform associations are similar to Claw Creek Unit. All archaeological sites are observed on the ground surface and most have buried materials. Two yielded datable prehistoric artifacts suggesting prehistoric use as early as 7,000 years ago. Two sites contained grinding stones indicating seed or root processing. Potential for finding additional sites eligible for the National Register in the unit is very high. From a cultural resources perspective, Slickear Creek Unit is the more important unit. The greater importance is due to presence of high quality obsidian and closer proximity to Burns Paiute Reservation, just north of Burns.

Cultural Heritage: Environmental Consequences

No Action Alternative

It is likely the No Action Alternative would not affect cultural resources unless cultural resources occurred in a dense stand of juniper. Cultural resources within dense stands of juniper may be affected if stands are not treated because decreased ground covering plants may allow for accelerated surface erosion, thus reducing the buried cultural deposits' integrity. Decreased ground covering plants can also contribute to increased ground surface visibility. Increased surface visibility can lead to loss of cultural material through illegal artifact collection. However, it is probable dense juniper stands have not progressed to the exclusion of all other vegetation and these two possibilities for effects are not active at this time.

Proposed Action Alternative

Chain saw cutting of juniper in sparse juniper stands is not likely to affect cultural resources. In fact, cutting and leaving trees without treating slash may positively affect cultural resources through release of shrub, grass, and forbs that may increase ground cover and decrease erosion and surface visibility.

Cutting and broadcast burning within site boundaries located within dense juniper stands is likely to produce high, sustained temperature levels, which could damage or destroy surface artifacts. These sites would be avoided/mitigated through Project Design Elements, thus, there should be no effect on these cultural heritage resources.

Burning piles when the ground is frozen or covered with snow would alleviate effects of high temperatures on subsurface artifacts in cultural sites. If burning is conducted as designed in the Proposed Action, no effects to subsurface cultural resources are expected.

Broadcast burning when soils are wet or frozen would minimize effects to subsurface archaeological materials because temperatures would be low. However, broadcast burning could affect surface archaeological materials because temperatures in contact with burning juniper trees could be high and sustained.

B. Noncritical Elements

Noncritical elements that are not known to be present or would not be affected by enacting either alternative are Lands and Realty, Minerals, Reclamation, and Wild Horses and Burros. Noncritical elements of the human environment which may be affected by the Proposed Action or No Action Alternative are:

1. Soils/Biological Soil Crusts

Current discussion and analysis of potential effects on Soils/BSC resources are tiered to the Three Rivers PRMP/FEIS, and relevant information contained in the following section is incorporated into this EA by reference: Sections 3-3.

Soils/BSCs: Affected Environment

Soil textures in the area are gravelly to very stony loams and silts; rock outcrops are also represented in both Claw Creek and Slickear Creek Unit boundaries. General soil series in Slickear Creek Unit include Gaib, Merlin, Anatone, Minam, Ateron, Rubbleland, Westbutte, Rock Outcrop, Vitale, and Teguro. No single soil series dominates Slickear Creek Unit. General soil series in Claw Creek Unit include Gaib, Merlin, Anatone, Minam, Ateron, Westbutte, Rock Outcrop, Egyptcreek, and Teguro. Merlin and Teguro soil series dominate Claw Creek Unit.

The project area has not been inventoried to determine if BSCs are present. The BSC are a suite of organisms that occupy the first few inches of soil surface. The main function of BSC is to increase soil stability and facilitate nutrient cycling in the surface few inches of soil. The BSC data specific to the northern Great Basin have been lacking in the past. For a discussion on how BSCs contribute to the functional, structural, and compositional parts of a functioning ecosystem see the technical reference (Biological Soil Crust Ecology and Management TR-1730-2). Common BSC likely to be found in the project area are included in the following list of genera: Byrum, Cladonia, Collema, Lecanora, Peltigera, Psora, and Tortula. This is not an all inclusive list of potential genera.

Soils/BSCs: Environmental Consequences

No Action Alternative

Under the No Action Alternative, there would be a continued increase of juniper and ponderosa pine cover and density in big sagebrush, low sagebrush (stiff sagebrush to a limited extent), quaking aspen, and riparian areas. Increase in overstory cover and density would further deplete the understory woody and herbaceous plant community. Reducing the understory vegetation would increase the amount of bare ground exposed to the forces of wind and rain. Erosion would increase on these sites. Reduction in understory vegetation would be most evident in areas dominated by big sagebrush and have shallow soils or a restrictive layer within 18 inches of the soil surface (Miller et al. 2001). In these areas, juniper and understory vegetation are forced to root in the same soil volume. Juniper is a much more effective competitor for resources and its roots dominate the soil horizon. The effect would be less dramatic on deeper soils. However, in deeper soils, juniper would still eliminate associated woody plants due to their similar rooting patterns and the ability of juniper to better compete for available resources. Under these conditions shrubs would be eliminated from the plant community before herbaceous vegetation.

Accumulating fuels especially from increasing numbers of juniper and quantities of duff in forested systems would increase the chances of a large-scale, high-intensity wildfire in the project area. High-intensity fires would increase the potential for scorched soils and creation of large, uninterrupted burned areas. Shallow soils and lithisols would not be as heavily impacted as a result of the No Action Alternative as fuels have been modified to a much lesser extent.

Duff accumulation in forested systems would continue and therefore not allow for soil exposure and establishment of BSC.

No Action would allow continued modification of vegetative communities by conifer expansion in some portions of the project area. The BSC in the project area may suffer from decreased light and moisture as a result of increased interception (greater conifer canopy).

Loss of BSC cover through wildfire and duff accumulation in some areas, especially areas with a major moss/shrub component, could experience prolonged BSC recovery periods. The BSC in areas of naturally low fuels (low sagebrush sites) would have less likelihood of experiencing fire events and would proportionately have less effects. If these areas remain untreated due to priority or other limitations, potential effects from conifer expansion could slowly occur.

Without reducing buildup of fuels, especially from increasing numbers of juniper, chances of a large-scale, high-intensity wildfire in the project area would be increased as well as the potential for creation of large, uninterrupted burned areas.

Proposed Action Alternative

By reducing buildup of fuels, especially from increasing numbers of juniper and quantities of duff in forested systems, chances of a large-scale, high-intensity wildfire in the project area would be reduced as well as the potential for scorched soils and creation of large, uninterrupted burned areas. Shallow soils and lithisols would not be heavily impacted as a result of implementation.

Duff reduction in forested systems would allow for soil exposure and establishment of BSC in areas where opportunity for establishment was lost.

The Proposed Action would reduce continued modification of vegetative communities by conifer expansion in some portions of the project area. The BSC in the project area may benefit from increased light and moisture as a result of decreased interception (reduced conifer canopy).

Prescribed burning in the form of broadcast, jackpot or individual tree burning could have an initial effect on BSC. Overall seral stage representation of BSC should be a mosaic that mirrors to some extent the mosaic of vascular plant community seral stages.

By removing BSC cover through burning, some areas, especially areas rich in moss/shrub species, could experience prolonged BSC recovery periods. The BSC in areas of naturally low fuels (low sagebrush sites) would have less likelihood of experiencing fire events and would proportionately have less effects. If these areas remain untreated due to priority or other limitations, effects from conifer expansion could slowly occur.

The intent of the proposed prescribed fire events is to create a mosaic of seral stages in vegetation. As a fire burns through an area, some vegetation is left unaffected; this concept applies to BSC as well. The BSC also occur in areas without vegetation, so the total remaining BSC cover in a burned area should be the sum of the cover in the unburned vegetation and untreated interspaces or areas of naturally low fuels.

The BSC in the project area could potentially suffer a limited loss of cover as a result of use of large track or wheeled machines to cut and pile trees. This loss of cover is limited in scale and would not be a reoccurring disturbance. The BSC would still be present in these site-specific disturbance areas and would continue to be a part of the functioning ecosystem.

2. Vegetation

Current discussion and analysis of potential effects on vegetation resources are tiered to the Three Rivers PRMP/FEIS, and relevant information contained in the following sections is incorporated into this EA by reference: Sections 3-3 and 3-7. All other vegetation (e.g., ponderosa pine) not addressed in this section will be addressed in the Forestry/Woodlands section.

Vegetation: Affected Environment

Vegetation communities within the project area contain significant physical and biological diversity that provide valuable wildlife habitat, watershed protection, and livestock forage. Past land management practices have shaped the plant community composition in the southeastern portion of Oregon. The following vegetation communities occur within or adjacent to the two project units:

- <u>Forested and Forest Fringe Communities (~15 percent of project area)</u>

  Forested areas with ponderosa pine or western juniper have expanded into portions of the project area over time. Mountain mahogany and quaking aspen are also present in areas. Understory vegetation is in varying conditions with mountain shrub and bunchgrass still present outside of areas with heavy duff accumulation or increased evergreen overstory. However, sagebrush still co-dominates some of the forested plant communities across much of the area.

- <u>Sagebrush Dominated Communities (~80 percent of project area)</u>

  Sagebrush species dominate many of the nonforested plant communities within the two project units. Ponderosa pine and western juniper have expanded into portions of the sagebrush dominated areas. However, sagebrush still dominates the plant communities across much of the area.

  Mountain Big Sagebrush Plant Communities (~31 percent of project area)

  Big sagebrush plant communities above approximately 4,500 feet are dominated by mountain big sagebrush. These sagebrush plant communities are some of the most productive plant communities within Burns District. A number of other shrubs are often found within the mountain big sagebrush plant communities. The most common shrubs associated with mountain big sagebrush are antelope bitterbrush, mountain snowberry, wax currant, rubber rabbitbrush, and snowbrush. Bluebunch wheatgrass, Idaho fescue, Thurber's needlegrass, western needlegrass, Sandberg's bluegrass, and junegrass are the dominant grasses.

Low and Stiff Sagebrush Plant Communities (~49 percent of project area)

Low sagebrush and stiff sagebrush plant communities are found on shallow soils or soils with a heavy clay layer within 16 inches of the soil surface. Antelope bitterbrush, rubber rabbitbrush, and green rabbitbrush are often found in association with low sagebrush. These larger shrubs are often found on slightly deeper soil islands within the low sagebrush plant community. Herbaceous vegetation is similar to the neighboring Wyoming or mountain big sagebrush plant communities. Sandberg's bluegrass, bottlebrush squirreltail, and Idaho fescue are the dominant perennial grasses.

Stiff sagebrush communities tend to form on lithisols and usually have a complex forb component usually comprised of biscuitroot, big headed clover, fleabane, milkvetch, and balsam root.

- Nonvegetated (<5 percent of project area)

  These acres within the project perimeters include rock outcroppings, rock faces and barren soils.

Vegetation: Environmental Consequences

No Action Alternative

Under the No Action Alternative, there would be a continued increase of juniper and ponderosa pine cover and density in big sagebrush, low sagebrush (stiff sagebrush to a limited extent), quaking aspen, and riparian areas. Increase in cover and density would further deplete the understory woody and herbaceous plant community. Under these conditions shrubs would be eliminated from the plant community before herbaceous vegetation.

Herbaceous vegetation would persist for a longer period because they root in upper soil horizons. Sites with deep soils (greater than 24 inches) may develop dense juniper woodlands with canopy cover approaching 75 percent and still maintain a good herbaceous plant cover. These sites would only occur over a small percentage (<20 percent) of the project area.

Noticeable effects from increasing juniper in low sagebrush communities would develop at a slower rate because of the lower productivity on these sites. Shrubs would be reduced, but juniper cover and density would not reach that of the big sagebrush plant communities.

In most cases, influence of juniper is limited to areas directly below the trees.

Low sagebrush sites may also contain very old trees. The low fire return interval of these sites allows juniper to establish and grow to a very old age (>500 years). Increase in juniper on these sites raises the risk of large-scale, high-intensity fires that may kill a large number of these old-growth trees.

Juniper would continue to increase in more productive quaking aspen and riparian areas. Juniper would reach very high densities and cover, approaching full canopy closure on some sites. A combination of intense competition for resources and heavy needle fall would reduce the understory herbaceous and woody plants to lower levels. Establishment of juniper alters the vegetation and fuel structure of these areas. A shift to coniferous vegetation from broadleaves increases fuel continuity and changes the fuel chemical composition. Dense juniper stands would increase the likelihood of high-intensity/severity fires in these areas.

Proposed Action Alternative

The project area is part of a fairly continuous block of sagebrush plant communities with stringers of conifers (juniper and ponderosa pine) and riparian corridors throughout (see riparian sections for effects to riparian communities). Reestablishment of shrub communities would help to restore sagebrush systems on a regional basis. Effects specific to each community type are as follows:

- Forested and Forest Fringe Communities

  Thinning ponderosa pine populations would restore the overall health and functionality of forested areas. Follow-up broadcast burning in these communities would reduce duff accumulation and promote understory recovery of shrub and forb components.

  Removal of juniper less than 130 years old would restore the site to its historic structure. Old-growth juniper would be left onsite. These old- growth trees are important for many neotropical migrant birds and small mammals. Response of understory vegetation to tree removal would be limited by the stage of encroachment.

- Sagebrush Dominated Communities

  Mountain Big Sagebrush-bunchgrass

  Juniper (and ponderosa pine to a lesser extent) has increased considerably in mountain big sagebrush plant communities. Prescribed fire or mechanical cutting have been effective methods used to reduce influence of juniper on this plant community in the past.

Cutting, followed by jackpot burning, has also been an effective method to balance plant community restoration and fire management concerns on areas where juniper has developed into closed woodlands. Juniper woodlands that have progressed to the point where understory shrubs have been reduced, or eliminated, would not carry fire into the canopy of trees. In general, only high-intensity fires that occur under severe climatic conditions would move from tree to tree in juniper woodlands. Temperature, relative humidity and wind conditions required for this to occur only happen on less than 1 percent of the days during an average fire season. Conditions rarely occur during late summer or fall when broadcast burning occurs. Cut juniper trees would provide protection for establishing grasses and forbs. Bates and others (2001) found sites with an understory vegetation cover of less than 5 percent had increased to greater than 30 percent 5 years after juniper cutting. Jackpot burning helps reduce the threat of high-intensity wildfire in cut juniper woodlands. This method would burn fine fuels, limit the ability of the fire to spread, and prevent soil sterilization from excessive heat. It is conducive to maintaining the shrub component on the site and the herbaceous plant species growing under downed junipers. Jackpot burning would impact herbaceous plants under a high accumulation of fuels. Burning when soils are frozen or saturated would reduce negative effects of jackpot burning. Burned patches would depend on precutting density, cover and average tree size. Winter burning of downed juniper slash was found to reduce negative impacts of jackpot burning by 30 percent (Bates et al. 2002). Native perennial grasses and forbs are capable of responding to removal of juniper and subsequent jackpot burning, if done when soils are frozen or saturated. If jackpot burning occurs during times when soils are dry, seeding would be required to limit establishment of undesirable plants.

Broadcast burning is an effective treatment of juniper in areas where shrubs are still present in the plant community. Burning would be done in a mosaic pattern with a goal of 40 to 60 percent of the area burned. This type of burning produces an irregular shaped burn with several patches of unburned areas intermixed within burned areas. This creates a greater amount of edge effect[10] than does burning in regular shaped blocks. Large amounts of edge and a number of interior unburned sagebrush islands increases overall landscape diversity and helps in reestablishment of a sagebrush dominated plant community. Miller and others (2000) state one native grass plant per 10 feet^2 is sufficient for native vegetation to recover following burning or cutting. If the threshold of one native grass plant per 10 feet^2 is not reached, seeding would be required to maintain a native plant population.

[10] **Edge effect:** The effect of the juxtaposition of contrasting environments on an ecosystem.

Low Sagebrush/Stiff Sagebrush-bunchgrass

The majority of juniper found on low and stiff sagebrush-bunchgrass sites have established over the last 110 to 130 years. Removal of these trees would help to reestablish appropriate low and stiff sagebrush plant communities. Cutting encroaching juniper would help to increase soil resources (water and nutrients) for grasses, forbs, and shrubs. Cutting would have the least impacts on the associated herbaceous and woody plants. The downed trees and slash would also moderate the environment for plants beneath the canopy of downed trees. Moderation of the environment would help to reduce effects of extremely cold or hot conditions on young establishing plants and protect those plants from grazing by domestic and wild ungulates.

Areas treated with a jackpot burn would maintain most shrub cover. Pile burning when soils are frozen or totally saturated would help to reduce individual plant death due to high temperatures caused by accumulation of fuels.

Broadcast burning of low sagebrush may occur on small portions of low sagebrush plant communities located within larger tracts of big sagebrush. Burning would result in conversion of small areas to perennial bunchgrass/forb dominated plant communities. Miller and Rose (1999) estimated establishment of low sagebrush following burning may take in excess of 50 years to occur on large burned areas. Establishment would occur quicker in areas where unburned patches of low sagebrush are left.

Low sagebrush sites are inherently low in productivity and change occurs slowly. Burning would reduce the cover of low sagebrush and mat-forming shrubs. Return to pre-burn shrub cover could take more than 50 years. Burning would also reduce the cover of low-growing, mat-forming forbs. However, larger perennial bunchgrass and deeper-rooted perennial forbs would fill in the cover left by the reduction of mat-forming plants. Impacts of burning would occur on a very small percentage (<10 percent) of the area because of the open nature of juniper woodlands on low sagebrush sites and the low likelihood of burning treatments occurring in these communities.

- <u>Quaking Aspen</u>

Juniper and pine encroachment into quaking aspen stands are exacerbating the general decline of quaking aspen documented across the western United States (Wall et al. 1999). Removing encroaching juniper and pine would help increase the amount of soil moisture and nutrients available to residual quaking aspen and understory plants.

Suckering would be encouraged by some physical damage caused by juniper and pine falling. Trees may knock over or damage some standing quaking aspen. This damage would help to facilitate the suckering of quaking aspen. However, resources released by cutting of juniper and pine would also be available for small juniper and pine that occur in the understory. Miller and Rose (1995) found up to 1,400 western juniper seedlings per acre in the understory of quaking aspen stands on Steens Mountain. Follow-up broadcast burning treatments would reduce the number of juniper and pine seedlings released following cutting and increase the number of quaking aspen suckers. Fencing with woven wire following treatment would protect new quaking aspen suckers from browsing by large wild herbivores and domestic livestock. Jackpot burning following cutting would also help to reduce juniper and pine seedlings. However, seedlings outside the burned area would not be killed by burning and would benefit from released nutrients and resources.

- Fuels Reduction

  Treatment of cut juniper and ponderosa pine would reduce the level of biomass, or fuel, left onsite. Burning during frozen or saturated soil conditions would help to reduce negative impacts of burning in areas with high fuels accumulations. Effects would be the same as burning in quaking aspen and riparian areas during the same time of year. Areas where high fuel levels occur may require post-burning seeding to facilitate establishment of perennial plants. Machine piling may be used to concentrate fuels. Compaction due to machine use would be limited by timing and concentrating travel paths. Working machinery on frozen soils would reduce negative soil impacts to negligible levels.

3. Wildlife

Current discussion and analysis of potential effects on wildlife resources are tiered to the Three Rivers PRMP/FEIS, and relevant information contained in the following sections is incorporated into this EA by reference: Sections 3-9, 3-10, and 3-11.

Wildlife: Affected Environment

Wildlife in addition to migratory birds and SSS occurring in the project area include mule deer, Rocky Mountain elk, pronghorn antelope, badger, black-tailed jackrabbit, cottontails, cougar, bobcat, coyote, several reptiles and amphibians, many other bird species, and a myriad of small mammal species. The project area falls entirely within the Oregon Department of Fish and Wildlife's (ODFW) Silvies River Hunt Unit for all big game species.

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

Mule deer and Rocky Mountain elk use the project area yearlong. The project area would be considered quality spring, summer, and fall habitats for both deer and elk. Approximately 25 percent and 15 percent of Slickear Creek Unit is classified as deer and elk winter range, respectively. In Claw Creek Unit approximately 70 percent of the area is classified as elk winter range. There is no part of Claw Creek Unit classified as deer winter range. However, wintering deer frequently use south facing slopes and open ridgetops in the 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 fall and winter. The project area offers forest fringe habitat which can provide good 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 or pine have encroached upon and outcompeted these key forage species, and have become woodlands. There are several other areas within the project area where 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 good winter forage for both wintering deer and elk. Overall the project area has a relatively small percentage (<10 percent) of winter range currently not being degraded by juniper or pine encroachment.

There is an abundance of thermal and hiding cover within the project area. Juniper, forested sites, and big sagebrush are major cover types used for hiding and thermal cover during 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.

Wildlife: Environmental Consequences

No Action Alternative

Under the No Action Alternative, no disturbance to wildlife would occur due to human activities. Plant communities would continue to transition toward juniper woodlands and overstocked conifer stands with reduced herbaceous understories. Pronghorn would be negatively affected by expansion of juniper and pine into the sagebrush communities as they prefer open habitats.

Browse species (bitterbrush, big sagebrush, chokecherry, etc.) that elk and especially deer rely upon in fall and winter would continue to decrease in quantity, health, 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 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 that utilize these habitats. This loss and degradation of habitat may eventually reduce habitat capacity for supporting current big game populations.

Thermal and hiding cover would increase under this alternative if a stand-replacement wildfire did not occur. Habitat quantity and quality for relatively few species that prefer dense juniper woodlands or dense ponderosa pine communities would increase. Overall, habitat diversity within the project area would decrease as a result of the No Action Alternative, thus causing an associated decrease in wildlife diversity occurring on the project area.

Proposed Action Alternative

Overall there is likely to be an increase in wildlife species diversity as a result of implementing the Proposed Action. Strategically placed juniper cuts, conifer thinning treatments, and prescribed burns within the project area would create a diversity of habitats. These actions would reduce juniper and pine encroachment, and cause an increase in grasses, forbs, and shrubby browse species. These treatments are likely to increase health, vigor, and palatability of winter forage for both deer and elk. In areas such as juniper woodlands and dense pine stands, quantity of winter forage browse species is expected to increase as well.

Protection and enhancement of mountain mahogany and aspen stands would also benefit deer and elk, as well as many other wildlife species. There would be a short-term loss of aspen habitats for big game species if aspen stands require a protective fence. Thermal and hiding cover would decrease as a result of the Proposed Action, but there would still be more than sufficient thermal and hiding cover in the project area.

Species utilizing more open habitats, such as pronghorn, would be favored as a result of the Proposed Action. Species favoring juniper woodlands and dense conifer stands would be negatively impacted as their preferred habitat would be targeted for removal by the Proposed Action. However, interior leave islands (No Action Areas) and the variation in prescriptions would allow for retention of some of these habitat types.

4. Fisheries: Affected Environment and Environmental Consequences

A few reservoirs (Willow and Stateline) within Slickear Creek Unit are stocked by ODFW with hatchery rainbow trout. Other non Special Status fish species occur within fish bearing streams of the project area. Enacting either alternative would not affect hatchery stocked rainbow trout in the reservoirs. Impacts to non Special Status fish species occurring within fish bearing streams within the project area would be the same as effects to Special Status fish species addressed previously, and will not be separately analyzed in this document.

5. Grazing Management

Current discussion and analysis of potential effects on Grazing Management are tiered to the Three Rivers PRMP/FEIS, and relevant information contained in the following sections is incorporated into this EA by reference: Sections 3-3 and 3-7.

Grazing Management: Affected Environment

The project includes portions of the following grazing allotments: Claw Creek #7010 and Skull Creek #7030. Observations from field visits and professional judgment have determined western juniper is showing a marked increase on many of the upland mountain big sagebrush-bunchgrasses and low/stiff sagebrush-bunchgrasses communities within the project area. Ponderosa pine stands are overstocked and have also encroached upon mountain big sagebrush-bunchgrass communities within the project area. Rangeland trend condition and photo analysis have also demonstrated the increase of western juniper and pine in these communities.

General season of use and a general summary for each allotment are as follows:

<u>Claw Creek Allotment #7010</u> – The Claw Creek Allotment contains 24,244 acres of BLM-administrated public land which is divided into eight pastures. The proposed project would affect approximately 5,000 acres within the Claw Creek Pastures. This pasture receives an early/graze (May 1 to June 15) season of use. Average actual use between 1990 and1999 was 191 AUMs. This allotment is in an improve category of management. During the 1999 assessment of Standards for Rangeland Health for this allotment, an IDT determined the following standards were not being achieved and past livestock grazing and juniper encroachment was a causal factor: watershed function in riparian areas, water quality, and native, T&E, and locally important species.

Skull Creek Allotment #7030 - Skull Creek Allotment contains 26,368 acres of public land which is divided into eight pastures. The proposed project would affect approximately 7,200 acres within the two largest of the eight pastures (Lake Creek and Boulder). Skull Creek Allotment has three grazing permits which graze 1,375 cattle from April 15 to June 10 in a rotational grazing management system. This allotment is in an improve category of management due to not meeting Standards for Rangeland Health for water quality (temperature) and for locally important species (redband trout habitat) due to water temperature and juniper encroachment. In the 2004 allotment IDT evaluation of this allotment, it was determined current livestock management was not a causal factor for not meeting these standards. Skull Creek is the perennial stream in this allotment which would be within the unit. Juniper encroachment was an identified concern on this allotment. As of the 2004 evaluation, 700 acres of western juniper had been cut.

Grazing Management: Environmental Consequences

No Action Alternative

All plant communities in these allotments are dependent on periodic fire to maintain forest and rangeland health and fire has been absent from most lands within this project area for 30+ years beyond the historic fire regime resulting in deteriorated rangeland and forest health. If juniper encroachment and ponderosa pine expansion are left untreated, rangeland plant community diversity would continue to decline. As plant communities transition to western juniper woodlands, browse species such as sagebrush and bitterbrush species are outcompeted for water and nutrients. This would impact watershed health and wildlife species more than current livestock grazing. As tree density increases, herbaceous species such as forbs and grasses decline which decreases the forage base for livestock and wildlife. As grass species decline in abundance, there is increased use by livestock on remaining plants. As remaining plants decrease in vigor, they make available more nutrients for tree species and the downward cycle would continue unless reductions in livestock use were implemented. With increases in juniper and pine and subsequent decreases in shrub and herbaceous components, comes an increase in competition for remaining forage between livestock and wildlife (elk, mule deer, and antelope). As this competition increases, livestock reductions would have to be made to continue managing for rangeland health. Even if livestock were reduced or removed, as juniper reaches the closed canopy woodland stage across a landscape, wildlife habitat value would continue to decline.

The No Action Alternative also leaves open the opportunity for heavy buildup of large woody fuel and the chance for intense wildfire. Currently the project area is in various stages of juniper encroachment from early transition to late transition to juniper woodlands which provide stressed and dying shrub species creating a drier fuel-bed, which increases the risk of large-scale, high-intensity wildfires. Although natural recovery of most plant communities following a severe wildfire is likely, it would be an unplanned economic burden on the grazing permittees as grazing would be removed for two or more years to allow plant communities to recover. Portions of the area where dead shrubs and overstocked tree stands exist would be sterilized by extreme heat from wildfire which would delay and or prohibit natural recovery and provide opportunities for noxious weed establishment.

Proposed Action Alternative

Combinations of treatments proposed for rangeland and forested plant communities would restore plant community diversity and improve watershed and rangeland health. Overstory and understory thinning, piling, and understory prescribed burning proposed for forested areas would release herbaceous species which provide forage for livestock and wildlife. It would increase overall plant diversity within these stands without damaging the older ponderosa pines.

Proposed treatments within rangeland plant communities would restore plant diversity to communities found under a more historic fire regime. All proposed treatments in rangelands should increase available soil moisture and release nutrients, resulting in an increased production of herbaceous and shrub species. An increase in herbaceous species would improve livestock distribution, thereby, reducing concentrations of livestock on any given area, and more uniform utilization patterns may result. The Proposed Action may decrease overall utilization levels as well. The Proposed Action would provide healthy plant communities with adequate forage for species with similar dietary preferences such as cattle and elk.

Implementation of the Proposed Action may require 1 to 3 years of rest from livestock grazing for the two pastures within Skull Creek Allotment and Claw Creek Pasture of Claw Creek Allotment. However, sequences of treatments could be planned which would provide minimal economic impacts to cooperating ranches with continuation of grazing in adjoining pastures in the allotments or would allow them to acquire alternative forage. Growing season rest may be required following jackpot burning to provide for plant recovery.

Recovery time of plant communities from proposed treatments would be less than those that would have to occur if a large-scale, high-intensity wildfire occurred. This is due to the fact that the disturbance from prescribed burning and cutting on plant communities which are beyond the historic fire regime (i.e., have juniper encroachment with a stressed and dead shrub component) is usually far less than disturbance from a wildfire.

6. Recreation: Affected Environment

Current discussion and analysis of potential effects on recreation/OHV resources are tiered to the Three Rivers PRMP/FEIS, and relevant information contained in the following sections is incorporated into this EA by reference: Sections 3-15.

Primary recreation activities in the project area are dispersed camping and hiking. These activities are usually associated with hunting big game such as mule deer, Rocky Mountain elk, and pronghorn antelope. Upland game bird and waterfowl hunting may also occur occasionally in the project area. Other recreation activities are rockhounding, photography, wildlife viewing, and driving for pleasure.

Recreation: Environmental Consequences

No Action Alternative

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 summer and fall seasons.

In the long term, big game hunting opportunities may diminish as habitat effectiveness declines with loss of species and structural diversity in rangeland and ponderosa pine woodland plant communities.

Proposed Action Alternative

Under the Proposed Action there may be brief impacts to recreational activities in the vicinity of the project area. Recreational activities within the project area would be affected by implementation of the Proposed Action. There may be temporary closures of areas while prescribed burns are taking place. Temporary closures are likely to be less than a week in duration. Smoke and noise generated during project implementation could disrupt recreational activities in spring or fall seasons. In the long term, recreational activities related to driving for pleasure, big game hunting, and wildlife viewing should be enhanced as habitat function and landscape diversity are expected to improve over time.

7. Economic and Social Values

Current discussion and analysis of potential effects on economic and social resources are tiered to the Three Rivers PRMP/FEIS, and relevant information contained in the following sections is incorporated into this EA by reference: Sections 3-25, 3-26, and 3-27.

Economic and Social Values: Affected Environment

Livestock raising and associated feed production industries are major contributors to the economy of Harney County. T he highest individual agricultural sales revenue in the county is derived from cattle production, which is inextricably linked to the commodity value of public rangelands. The cattle industry provided $48,782,000 in sales in Harney County in 2007 [Oregon State University (OSU), Extension Service 2007]. Nearly half the county taxes are derived from the ranching community (www.harneycounty.com 2003).

Those engaged in ranching and forage production are an important part of the history, culture and economy of Harney County and make up a strong component of the fabric of the local societies. Livestock grazing operations on public and private lands, as well as fire and forestry management, can have a stabilizing influence on local employment and quality of life (social, health, economic and environmental conditions).

"Quality of life" is very individual when determining what is valued in a lifestyle and what features make up that lifestyle. Lifestyle features can be determined by historical activities of the area, career opportunities, and the general cultural features of the geographical area. Quality of life issues are subjective and can be modified over time with exposure to other ways of living.

Recreation is a component of most lifestyles in the area and includes driving for pleasure, camping, hunting, hiking, rockhounding, photography, wildlife viewing, and sightseeing for the overall quality of life for residents. In addition to local recreation use, the undeveloped, open spaces in the county are themselves a tourist attraction and contribute a "sense of place" for many. The attachment people feel to a setting, typically through a repeated experience, provides them with this sense of place. Attachments can be spiritual, cultural, aesthetic, economic, social or recreational.

These amenities enhance local communities and tourism, though the specific contribution of the project area is not known. Hunting and other types of dispersed outdoor recreational experiences also contribute to the local economy on a seasonal basis. Fee hunting and recreation alone contributed $100,000 to Harney County in 2007 (OSU, 2007).

Economic and Social Values: Environmental Consequences

No Action Alternative

Under this alternative, no service contracts would be granted and no supplies would be purchased from local vendors for the purpose of project implementation. Woodland harvest areas would not be made available for public use.

The value of livestock production in 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 as habitat quality deteriorates. Recreational activities in the project area associated with wildlife viewing, photography, and driving for pleasure would continue under this alternative, but they may be reduced as habitat quality deteriorates and landscape diversity decreases over time.

Proposed Action Alternative

There would be effects to the local economy under the Proposed Action. The Proposed Action would utilize stewardship or service contracts to reduce biomass in the project area. Purchase of supplies and equipment necessary for implementation of the Proposed Action from community merchants would constitute an additional economic effect. Biomass may be made available for alternative energy plants as well.

The Proposed Action would improve rangeland health which would increase forage production for livestock thereby increasing economic opportunities for the livestock industry. Disruption to agribusiness during the prescribed burns and the required rest period may occur. There could be a short-term loss of economic opportunities for the livestock industry if the project area requires rest (no livestock grazing) after implementation of the Proposed Action. If grazing rest is required, it would return within a couple of years.

Recreational activities would be enhanced as habitat function and landscape diversity are expected to improve following implementation of the Proposed Action.

8. Visual Resources

Current discussion and analysis of potential effects on visual resources are tiered to the Three Rivers PRMP/FEIS, and relevant information contained in the following section is incorporated into this EA by reference: Sections 3-17.

Visual Resources: Affected Environment

The project area is remote and not visible from any highway. The entire Claw Creek Unit is classified as a Visual Resource Management (VRM) Class III. Management direction from Three Rivers RMP for a VRM Class III calls for partial retention of the landscape character. Approximately 60 percent of Slickear Creek Unit is classified as a VRM Class III as well. The remaining 40 percent of Slickear Creek Unit is classified as a VRM Class IV. Management direction from Three Rivers RMP for a VRM Class IV allows for modification of the landscape character.

Visual Resources: Environmental Consequences

No Action Alternative

There would be no effects anticipated to visual resources under the No Action Alternative in the short term unless a large-scale, high-intensity wildfire event occurred in the area. A large-scale, high-intensity wildfire event would drastically change the visual resources in the project area. In the long term, visual resources would be negatively impacted due to loss of plant community diversity and structure on the landscape.

Proposed Action Alternative

The Proposed Action meets management direction outlined in Three Rivers RMP for VRM Classes III and IV. Visual resources would be affected while treatments are taking place. Upon completion of the project, visual resources and aesthetic character of the project area should be enhanced as regeneration of grasses, forbs, shrubs, and trees takes place and overall health and diversity of the project area improves.

9. Forestry/Woodlands

Current discussion and analysis of potential effects on forestry and woodland resources are tiered to the Three Rivers PRMP/FEIS, and relevant information contained in the following sections is incorporated into this EA by reference: Sections 3-3 and 3-7.

Forestry/Woodlands: Affected Environment

There are two types of forests/woodlands in the project area: ponderosa pine woodland and ponderosa pine forested areas.

P*onderosa Pine Woodland Areas:*

Portions 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 mountain big sagebrush/bunchgrass and mountain mahogany communities. These areas contain about one or two large trees per acre generally greater than 24 inches DBH and are more than 250 years old. Locally dense pockets of these large pines occur (10 to 30 trees/acre), generally less than 5 acres in size. Throughout these woodlands, encroaching ponderosa pines from 1 to 20 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 established due to lack of wildfire and are considered to be far more common than historical stocking levels. These pines and western junipers of similar age have invaded 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 and fire suppression. Snags and downed logs occur infrequently. Health and vigor of pine trees in these units are generally poor to fair.

Ponderosa Pine Forested Areas:

Ponderosa pine forests occur in Slickear Creek and Claw Creek drainages and in scattered pockets throughout the project area. The vast majority of these stands can be characterized as having an overstory that is lightly (3 to 5 trees per acre) stocked with large diameter (>24-inches DBH) ponderosa pine. These areas differ from woodlands in that the density of all sizes of ponderosa pine is much greater. Throughout the project area, the understory trees are considerably overstocked with far more trees per acre than what historically existed. 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). A few localized pockets of Douglas-fir occur in conjunction with the ponderosa pine and exhibit similar tree sizes and stocking levels. Past management in Slickear Creek area has been limited to fire suppression with no thinning and limited harvest in the overstory in the 1950s. Claw Creek area had a commercial harvest in the mid-1960s followed by limited pre-commercial thinning of the understory. Overall health and vigor of all stands are poor. Stocking levels are considerably 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. The number of snags is generally low with a few large diameter old pine snags. Locally there are pockets of beetle killed, pole-sized snags. More than 75 percent of ponderosa pine forested areas within the project area have deep duff (4 to 8 inches deep) with minimal herbaceous and shrub cover.

Aspen occurs in a number of areas generally on north and east facing slopes. These shade intolerant aspen stands are being overtopped by conifers and are shrinking in size due to ongoing mortality and no reproduction. Where live aspen still do exist, they are of generally low vigor with skeletons of dead aspen trees quite common.

Forestry/Woodlands: Environmental Consequences

No Action Alternative

P*onderosa Pine Woodland Areas:*

Mountain mahogany and bitterbrush would continue to decrease in abundance and would eventually die from being overtopped by encroaching ponderosa pine and junipers. These encroaching ponderosa pines and junipers would continue to thrive at unprecedented population levels. It is likely that any wildfire would become an unnatural stand replacement fire, destroying valuable habitats and vegetative resources. It would be considered unnatural due to heavy fuel loading created by the encroaching ponderosa pine and juniper trees.

P*onderosa Pine Forested Areas:*

Implementation of the No Action Alternative would have a continued negative impact on stands. 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). 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 and others 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 large-scale, high-intensity wildfire.

The remnant aspen stands would continue to suffer mortality from being overtopped by expansion ponderosa pine and junipers (Wall and others 2000). Aspen suckers would continue to be browsed and aspen clones would face eventual stand death. It is likely any wildfire would become an unnatural stand replacement fire, destroying valuable habitats and vegetative resources.

Proposed Action Alternative

Ponderosa Pine Woodland Areas:

Western juniper would decrease to be more in line with historical levels. Small and medium-sized ponderosa pine stocking would be reduced considerably.

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 with some other sizes dispersed through the sagebrush/bunchgrass community.

P*onderosa Pine Forested Areas:*

The Proposed Action would restore the character of stands to near their historic condition. The overstory would continue to consist of large-diameter ponderosa pines. Character of the understory would 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. 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 cover of herbaceous and shrub species.

Aspen stands would respond to treatments and would reproduce and remain in the project area.

10. Fire Management

Current discussion and analysis of potential effects on fire management are tiered to the Three Rivers PRMP/FEIS, and relevant information contained in the following section is incorporated into this EA by reference: Sections 3-15.

Fire Management: Affected Environment

Slickear Creek and Claw Creek Units are located in Silver and Silvies FMUs. Suppression of wildfires is the primary fire management goal for these FMUs. A number of fuel types are present in these FMUs. Vegetation within the project area is primarily dominated by sagebrush communities and ponderosa pine. Western juniper has encroached upon all plant communities occurring in the project area to varying degrees. The area has numerous roads that help in suppression operations.

The project area has a history of wildfire occurrence. Since 1990 the Slickear Creek Unit has had five fires recorded as occurring within its boundaries and several others occurring in the vicinity. Since 1990 the Claw Creek Unit has had eight fires recorded as occurring within its boundaries and several others occurring in the near vicinity. Large fires have occurred within the last 20 years in the vicinity of both units.

An FRCC analysis was conducted for both Slickear Creek and Claw Creek Units (refer to Appendix E for a more detailed definition and description of fire regimes and condition classes). The FRCC is a measurement used to determine how departed a geographic unit or plant community is from its historical fire regime or plant community structure. A Condition Class 1 represents an area where composition and structure of vegetation and fuels are similar to the natural (historic) regime. In other words, a Condition Class 1 represents what you would expect to find at the site prior to European settlement in the area. The risk of loss of key ecosystem components is low. A Condition Class 2 represents an area where composition and structure of vegetation and fuel are moderately altered from the natural regime. The risk of loss of key ecosystem components is moderate. A Condition Class 3 represents an area where composition and structure of vegetation and fuel are highly altered from the natural regime. The risk of loss of key ecosystem components is high.

FRCC Analysis for Slickear Creek Unit:

The FRCC analysis for Slickear Creek Unit indicates the plant communities have shifted from their historic fire regime. Three major Biophysical Settings (BpS), otherwise known as vegetation classifications, were identified and analyzed within Slickear Creek Unit for the FRCC analysis. Low sagebrush BpS was the largest of the three, comprising 50 percent of the unit. Analysis indicated the low sagebrush BpS was classified as Fire Regime IV (35-100+ year wildfire frequency and low to mixed severity) and Condition Class 3. Ponderosa pine BpS represents 32 percent of the unit, and is classified as Fire Regime I (0-35-year frequency and low to mixed severity) and Condition Class 3. Mountain big sagebrush BpS represents 14 percent of the unit and is classified as Fire Regime II (0-35 year frequency and high severity) and Condition Class 3. All plant communities were classified as being in Condition Class 3, indicating plant communities were considerably altered from their historic fire regimes. To move Slickear Creek Unit and individual plant communities toward a more appropriate fire regime, the vegetation structure and composition must be modified.

FRCC Analysis for Claw Creek Unit:

The FRCC analysis for Claw Creek Unit indicates the plant communities have shifted from their historic fire regime. Three major BpS were identified and analyzed within Claw Creek Unit for the FRCC analysis. The low sagebrush BpS was classified as a Condition Class 3, and represents 49 percent of the unit.

Ponderosa pine BpS represents 19 percent of the unit, and is classified as being in a Condition Class 3. Mountain big sagebrush BpS represents 24 percent of the unit and is also classified as being a Condition Class 3. All plant communities were classified as being in Condition Class 3, indicating plant communities were considerably altered from their historic fire regimes. The overall FRCC for the unit was determined to be a Condition Class 3. The analysis also suggests that to move Claw Creek Unit toward the historic FRCC conditions, both fuel structure and vegetation composition need to be altered.

Fire Management: Environmental Consequences

No Action Alternative

Fuel loadings would not be reduced and 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 amass woody debris, present a crown fire hazard and threaten private property and resource values. Firefighters would be placed at greater risk during future suppression efforts in environments with elevated fuel loads.

In areas being encroached upon by western juniper, the size of most wildfires would remain small because of the reduced ability of the site to carry fire because of decreased understory herbaceous plants and shrubs (areas lacking ground fuel connectivity). However, under severe conditions,[11] risk of larger fires increases because of increased continuity of crown fuels. Fires under these conditions have potential to burn large areas and are difficult to suppress. Suppression actions under these conditions would rely primarily on indirect attack. This suppression tactic relies on line constructed (hand, dozer, etc.) at some distance from the fire and unburned fuel between the fireline and flaming front is burned. This tactic increases the area burned. Accumulation of fuels would also require a greater mop-up[12] effort following control of wildfire. Overall, both units would remain in a Condition Class 3 where the risk of large-scale, high-intensity wildfires and negative effects to human life and the environment reach their maximum.

[11] **Severe Conditions:** Severe conditions could include any or a combination of all of the following: high temperatures, low relative humidity, and high wind speeds.
[12] **Mop-up:** The work after the fire has been controlled to assure fire does not flare up again and escape control lines.

Proposed Action Alternative

The Proposed Action would reduce intensity and severity of wildfires and risk to firefighters by altering the continuity of fuels in the project area. Suppression actions would be able to employ more direct attack strategies minimizing acres burned in wildfires. Firefighters may rely more on natural fuel breaks and changes in fuels. Less fireline may need to be constructed to suppress wildfires.

Implementation of the Proposed Action would lower the risk of a large-scale, high-intensity wildfire event occurring within either unit. The overall FRCC rating of both units would likely change from a Condition Class 3 to a Condition Class 2 as open, early-seral shrublands increase across the landscape and closed-canopy pine forest and juniper woodland stands are treated. The Proposed Action would likely move portions of the project area into a Condition Class 1, which is an NFP goal.

Treatments would reduce the FRCC from a rating of Class 3 to Class 2 or Class 1 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).

The FRCC rating of the ponderosa pine dominated forest and woodland stratum would decrease from a Class 3 to Class 2 or Class 1 as fuel loading is decreased and fuel patterns are less continuous. Fire behavior in these areas can be expected to have low rates of spread, low fire intensities, and low flame lengths immediately following fuel treatments.

Overall FRCC rating of low and stiff sagebrush dominated sites within the project area is currently a Condition Class 3. Where treatments occur it is expected to move the FRCC to a Condition Class 1. However, not all low/stiff sagebrush areas would be treated. Therefore, the Proposed Action would only lower the overall FRCC rating for low/stiff sagebrush communities in the project area to a Condition Class 2.

11. Transportation/Roads

Current discussion and analysis of potential effects on transportation/road resources are tiered to the Three Rivers PRMP/FEIS, and relevant information contained in the following sections is incorporated into this EA by reference: Sections 3-23 and 3-24.

Transportation/Roads: Affected Environment

General access to Slickear Creek Unit is via U.S. Hwy 20, Hines Logging Road (the 47 road), and Skull Creek Road. Local access into and around Slickear Creek Unit is via roads and trails crossing BLM and private lands. These roads all originate off Skull Creek Road.

General access to Claw Creek Unit is via U.S. Hwy 20, Silver Creek Road, and Forest Road No. 4130. Local access into and around Claw Creek Unit is via roads and trails crossing BLM, private, and National Forest lands. These roads all originate off Forest Road 4130.

Transportation/Roads: Environmental Consequences

No Action Alternative

There would be no known impacts on transportation/roads as a result of the No Action Alternative unless there is a wildfire event. Wildfire suppression activities could have effects on roads within the project area if a large-scale, high-intensity wildfire event occurred. However, road damage caused by fire suppression is generally rehabilitated following the fire if funds are available.

Proposed Action Alternative

Some project activities such as cutting, piling, and burning 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 can create ruts, "drive arounds," and other damage to the road and adjacent soils and vegetation. These ruts become channels for runoff causing additional damage to the road and offsite erosion and sedimentation. Without corrective maintenance, over time the roadbed washes out making it difficult to traverse rocks and boulders. Ultimately another route paralleling the original road may develop and the original road abandoned. This results in long-term loss of vegetation, habitat, and land productivity and can result in safety and liability issues associated with public use of the road.

During dry periods damage to roads by vehicles and equipment accessing the area for project purposes is less consequential. Powdering of the road may occur during dry periods with heavier traffic associated with intensive project work. This creates dust and visibility problems but is generally confined to the local area. In some cases deep, dry ruts and dust pockets develop in roads causing affects similar to those that occur from wet season traffic. Heavy traffic during the dry season also loosens soil making it easier to erode during the wet season.

Other effects of project activities on transportation may include temporary loss of public access during certain phases of implementation of the Proposed Action such as prescribed burns. There would also be a loss of or realignment of approximately 0.75-mile of a two-track road in Claw Creek Unit. If the road is removed, it should not affect any through traffic transportation, as it is a very rough road that dead ends due to topographic features.

In the past the BLM has been quick to rehabilitate any damage to roads on both private and public lands related to implementation of projects. Adherence to project design features would also help alleviate all aforementioned transportation concerns.

C. Cumulative Effects

As the Council on Environmental Quality (CEQ), in guidance issued on June 24, 2005, points out, the "environmental analysis required under NEPA is forward-looking," and review of past actions is required only "to the extent that this review informs agency decision-making regarding the Proposed Action." 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 the Proposed Action's direct and indirect effects.

The CEQ stated in this guidance that "[g]enerally, 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." This is because a description of the current state of the environment inherently includes the effects of past actions. The CEQ guidance specifies that the "CEQ regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions." Our information on the current environmental condition is more comprehensive and more accurate for establishing a useful starting point for a cumulative effects analysis, than attempting to establish such a starting point by adding up the described effects of individual past actions to some environmental baseline condition in the past that, unlike current conditions, can no longer be verified by direct examination.

The second area in which the CEQ guidance states that information on past actions may be useful is in "illuminating or predicting the direct and indirect effects of a 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. However, "experience with and information about past effects of individual past actions" have been found useful in "illuminating or predicting the effects" of the Proposed Action in the following instances: predicting the effects of the Proposed Action and its alternatives is based on published empirical research and the general accumulated experience of the resource professionals in the agency with similar actions.

1. Cumulative Effects Analysis Area

The Cumulative Effects Analysis Area (CEAA) looked at all lands within the ODFW's Silvies Hunt Unit, which includes the watersheds the project area falls within and several other neighboring watersheds, within Three Rivers RA (Map 6). The CEAA encompasses approximately 803,000 acres consisting of various ownerships. The BLM administers approximately 232,000 acres within the CEAA.

2. No Action: Cumulative Effects

At the Silvies Hunt-Unit scale, effects of the No Action Alternative could be considered cumulative with effects to similar areas in the same watersheds receiving no landscape-level treatments. Other juniper control and forest health projects occurring on BLM-administered lands within this CEAA include Three Rivers Juniper Management Project (EA OR-025-00-04), Strategic Fuels Break Project (EA OR-025-03-030), Dry Mountain Fuels Reduction Project (DNA OR-025-03-011), SHED Forest Restoration Project (EA OR-025-04-038), and the North-Central Fuels Reduction Project (CX OR-05-025-041).

The effect of forested areas becoming overstocked and at high risk for large-scale, high-intensity wildfire on human safety, private property, wildlife habitat, aquatic resources, cultural resources, livestock grazing, and SSS may be cumulative with effects of overstocked forests with high risk of large-scale, high-intensity wildfire on other landscapes within this CEAA. In addition, the effect of the transition of mountain big sagebrush-bunchgrass communities and low/stiff sagebrush-bunchgrass communities to juniper woodlands on wildlife habitat, aquatic resources, cultural resources, livestock grazing, and SSS may be cumulative with the effects of juniper woodland development on other similar landscapes within these watersheds. Accumulations of hazardous fuel in the project area, in combination with other hazardous fuels on adjacent BLM and USFS-administered and private lands within this CEAA, would increasingly threaten resource values, private property values, and human safety over time in these watersheds. (Please see individual resource sections for a detailed description of effects.)

3. Proposed Action: Cumulative Effects

At the Silvies Hunt Unit scale, effects of the Proposed Action could be considered cumulative with effects of previous and reasonably foreseeable future vegetation management projects in this area. Other juniper control and forest health projects occurring on BLM-administered lands within this CEAA include Three Rivers Juniper Management Project (EA OR-025-00-04), Strategic Fuels Break Project (EA OR-025-03-030), Dry Mountain Fuels Reduction Project (DNA OR-025-03-011), SHED Forest Restoration Project (EA OR-025-04-038), and the North-Central Fuels Reduction Project (CX OR-05-025-041).

Most BLM-administered land within the CEAA is comprised of sagebrush communities. There are approximately 74,000 acres of BLM-administered land in the CEAA dominated by mountain big sagebrush. The Proposed Action in concert with other juniper control efforts in the watersheds would reduce influence of western juniper on approximately 9,320 acres or roughly 12.6 percent of mountain big sagebrush on BLM-administered lands within the CEAA. There are approximately 127,000 acres of BLM-administered land in the CEAA that is dominated by low or stiff sagebrush. The Proposed Action in concert with other juniper control efforts in the CEAA would reduce influence of western juniper on approximately 11,980 acres or roughly 9.4 percent of the low and stiff sagebrush on BLM-administered lands within the CEAA. There are approximately 16,100 acres of BLM-administered land in the CEAA supporting ponderosa pine. The Proposed Action in concert with other forest health projects in the CEAA would improve forest health on up to an estimated 5,940 acres or roughly 37 percent of BLM-administered land supporting ponderosa pine in the watershed.

The Proposed Action includes Project Design Elements developed to avoid or minimize effects to fisheries, SSS habitat, cavity-nesting bird habitat, big game cover and forage values, cultural resources, and economic and social values. Project Design Elements would also limit the ability of noxious weed expansion or establishment. Project Design Elements would reduce effects related to loss of soil productivity and sedimentation of water sources to levels immeasurable at a watershed scale. Effects of smoke on air quality would be short lived. (Please see individual resource sections for a detailed description of effects.)

CHAPTER IV: CONSULTATION AND COORDINATION

A. Agencies and Individuals Consulted

Burns Paiute Tribe
Harney County Court
Oregon Department of Fish and Wildlife
Craig L. Schmitt, Blue Mountain Pest Management Service Center Pathologist
Lia H. Spigel, Blue Mountain Pest Management Service Center Entomologist
U.S. Forest Service: Malheur National Forest, Emigrant Creek Ranger District

B. Interdisciplinary Team

Lindsay Davies, Fisheries Biologist/Aquatic Specialist
Laura Dowlan, Natural Resource Specialist-Recreation
Rhonda Karges, District Planning/Environmental Coordinator
Doug Linn, Fuels Botanist
Nick Miller, Fuels Wildlife Biologist, Lead Preparer
Brett Page, Natural Resource Specialist (Recreation)
Ronda Purdy, Rangeland Management Specialist
Skip Renchler, District Lands and Realty Specialist
Jon Reponen, Supervisory Natural Resource Specialist (Forestry)
Lesley Richman, Natural Resources Specialist (Weeds)
Dan Ridenour, Fuels Planner
Scott Thomas, District Archaeologist

C. Advisory

Jim Buchanan, Supervisory Natural Resource Specialist
Kelly Hazen, Geographic Information System Specialist
Rhonda Karges, District Planning/Environmental Coordinator
Dave Toney, Prescribed Fire Implementation Specialist

References:

Anderson, Hal E. 1982. Aids to determining fuel models for estimating fire behavior. Gen. Tech. Rep. INT-122. Ogden, UT: U.S. Department of Agriculture, Forest, Service, Intermountain Forest and Range Experiment Station. 22 p. [FEIS id: 2901] [Call: F]

Agee, James K. 1993. Fire ecology of Pacific Northwest forests. Washington, DC: Island Press. 493 p. [FEIS id: 22247] [Call: B(fire)]

Agee, James K. 1994. Fire and Weather Disturbances in Terrestrial Ecosystems of the Eastern Cascades [of Oregon]." GTR-PNW-320. Portland, OR: USDA Forest Service, Pacific Northwest Research Station.

Barrett, Stephen W. 1980. Indians and Fire. In: *Western Wildlands*, Vol. 6, #3 (Spring): 17-21.

Bates, Jon D., Miller, Richard F. and Svejcar, T. 1998. Understory patterns in cut western juniper (*Juniperus occidentalis* ssp. *Occidentalis* HOOK.) woodlands. Great Basin Naturalist 58(4): 363-374.

Bates, J., R.F. Miller, T.J. Svejcar. 1999. Plant succession in cut juniper woodlands; 1991–98. *In*: Range field day 1999, Juniper Woodlands: History, Ecology, and Management. Special Report 1002. Corvallis, OR: Eastern Oregon Agricultural Research Center and Department of Rangeland Resources, Oregon State University. p 30–43.

Bates, Jon D., Miller, Richard F. and Svejcar, T. 2000. Understory Vegetation Response and Nitrogen Cycling Following Cutting of Western Juniper. Journal of Rangeland Management 53: 119-126.

Bates, Jon D., and R.F. Miller. 2004. Restoration of Aspen Woodland Invaded by Western Juniper: Applications of Partial Cutting and Prescribed Fire. 16 Int'l Conferences, Society for TH Ecological Restoration, August 24-26, Victoria, Canada.

Binford, Lewis R. 1980. Willow Smoke and Dogs' Tails: Hunter-Gatherer Settlement Systems and Archaeological Site Formation. *American Antiquity* 45(1): 4-20.

Bowers, W., B. Hosford, A. Oakley and C. Bond. 1979. Wildlife habitats in managed rangeland –the Great Basin of southeastern Oregon, Native Trout. USDA Forest Service General Technical Report PNW-84.

Brimlow, George. 1951. Harney County and Its Rangeland. Binford and Mort Publishers, Portland, Oregon.

Buckhouse, J.C. and J.L. Mattison. 1980. Potential Soil Erosion of Selected Habitat Types in the High Desert Region of Central Oregon. Journal of Rangeland Management. 33:282–285.

Burkhardt, J.W., and E.W. Tisdale. 1976. Causes of Juniper Invasion in Southwestern Idaho. Ecology 57(3): 472-484.

Cochran, P.H.; Geist, J.M., Clemens, D.L., Clausnitzer, Rodrick R.; Powell, David C. 1994. Suggested Stocking Levels for Forest Stands in Northeastern Oregon and Southeastern Washington. Res. Note PNW-RN-513. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 21 p.

Couture, Marilyn D. 1986. Foraging Behavior of a Contemporary Northern Great Basin Population. Journal of California and Great Basin Anthropology 8:150-160.

Dwire, K.A., and J.B. Kauffman. 2003. Fire and Riparian Ecosystems in Landscapes of The Western USA. Forest Ecology and Management. 178(1-2): 61-74.

Elliot, W.J. and Audin, L.J., (Eds.). (2006, March 21--last update). DRAFT Cumulative Watershed Effects of Fuels Management in the Western United States. [Online]. Available: http://forest.moscowfsl.wsu.edu/engr/cwe/ [2007, February 7--access date].

Hagen, C.A. 2005. Greater Sage-grouse Conservation Assessment and Strategy for Oregon: A plan to maintain and enhance populations and habitat. Oregon Department of Fish and Wildlife, Salem, USA.

Hardy, C.C., Schmidt, K.M., Menakis, J.M., Samson, N.R. 2001. Spatial Data for National Fire Planning and Fuel Management. International Journal of Wildland Fire 10:353-372.

Gedney, D.R., D.L. Azuma, C.L. Bolsinger, Neil McKay. 1999. Western Juniper Ecology in Eastern Oregon. PNW – GTR – 464. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.

Gucker, Corey L. 2006. Cercocarpus ledifolius. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ (2006, August 29).

Langston, Nancy. 1995. Forest Dreams, Forest Nightmares: The Paradox of Old Growth in the Inland West. University of Washington Press. Seattle.

Linderman, Carole A. 1992. The Effects of Fire on Obsidian Artifacts: A Problem in Hydration Dating in a Woodland Environment. Unpublished Senior Honors Paper, Department of Anthropology, University of Oregon, Eugene, Oregon.

Malheur Basin Action Plan. 1999. Malheur-Owyhee Watershed Council.

Maser, C., J.W. Thomas, and R.G. Anderson. 1984. Wildlife Habitats in Managed Rangelands – The Great Basin of Southeastern Oregon – The Relationship of Terrestrial Vertebrates to Plant Communities, Part 1, Text. USDA general technical report PNW-172.

Miller, R.F. and Jeffery A. Rose. 1999. Fire History and Western Juniper Encroachment in the Shrubs Steppe. Journal of Rangeland Management, Nov. 1999.

Miller, R.F., Svejcar T.J. and N.E. West. 1994. Implications of livestock grazing in the intermountain sagebrush region: plant composition. Pages 101-146 In: Ecological Implications of Livestock Herbivory in the West. Vavra M, Laycock WA & Pieper RD (eds.), Society for Rangeland Management, Denver, Colorado U.S.A.

Miller, R.F., T.J. Svejcar, J.R. Rose. 2000. Impacts of Western Juniper on Plant Community Composition and Structure. Journal of Rangeland Management. 53:574–585.

Miller, R.F., J.D. Bates, T.J. Svejcar, F.B. Pierson, and L.E. Eddleman. 2005. Biology, Ecology, and Management of Western Juniper (*Juniperus occidentalis*). Oregon State University Agricultural Experiment Station Technical Bulletin 152. 82pp.

Miller, R.R., and R.J. Tausch. 2001. The role of fire in pinon and juniper woodlands: a descriptive analysis. Pages 15-30. *In* K.E.M. Galley and T.P. Wilson (editors). Proceedings of the Invasive Species: the Role of Fire in the Control and Spread of Invasive Species. Miscellaneous Publication No. 11, Tall Timbers Research Station, Tallahassee, Fl.

National Park Service. 1990. Guidelines for Evaluating and Documenting Traditional Cultural Properties. National Register Bulletin 38. National Park Service, National Register of Historic Places, Washington D.C.

Obedzinski, R.A., Schmid, J.M., Mata, S.A., Kessler, R.R.. 1999. Growth of Ponderosa pine Stands in Relation to Mountain Pine Beetle Susceptibility. General Technical Report RMRS-GTR-28. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 13 p.

Olson, Diana L. 2000. Fire in Riparian Zones: A Comparison of Historical Fire Occurrence in Riparian and Upslope Forests in the Blue Mountains and southern Cascades of Oregon. Seattle: University of Washington. M.S. Thesis.

Pierson, F.B., W.H. Blackburn, S.S. Van Vactor, and J.C. Wood. 1994. Partitioning small scale spatial variability of runoff and erosion on sagebrush rangeland. Water Resources Bulletin 30:1081-1089.

Reeves, G.H., Benda, L.E., Burnett, K.M., Bisson, P.A., Sedell, J.R., 1995. A Disturbance-Based Ecosystem Approach to Maintaining and Restoring Freshwater Habitats of Evolutionarily Significant Units of Anadromous Salmonids in The Pacific Northwest. In: Nielsen, J. (ed.), Evolution and the Aquatic Ecosystem. Amer. Fisheries Soc. Symposium 17, Bethesda, MD, pp. 334-349.

Reid, K.D., B.P. Wilcox, D.D. Breshears, and L. MacDonald. 1999. Runoff and Erosion in a Piñon-Juniper Woodland: Influence of Vegetation Patches. Soil Sci. Soc. Am. J. 63:1869-1879.

Reinkensmeyer, D., and R.F. Miller. 2000. Habitat Association of Bird Communities in Shrub Steppe and Western Juniper Woodlands. Eastern Oregon Agriculture Research Center. Annual Report.

Roberts, C., and J.A. Jones. 2000. Soil patchiness in juniper-sagebrush – grass communities of central Oregon. Plant and Soil 223:45-61.

Robichaud, P.R. 2000. Forest Fire Effects on Hillslope Erosion: What We Know. Watershed Management Council Networker 9(1).

Schmidt, Kristen M.; Menakis, James P.; Hardy, Colin C.; Hann, Wendel J.; Bunnell, David L. 2002. Development of Coarse-Scale Spatial Data for Wildland Fire and Fuels Management. RMRS-87. USDA Forest Service, Rocky Mountain Research Station.

Schwabe, L. and R. Perkins. 2003. Evaluate the Life History of Native Salmonids Within the Malheur Subbasin, FY 2002 Annual Report. Report to Bonneville Power Administration, Portland, Oregon.

Skinner, Craig E., Jennifer J. Thatcher, and M. Kathleen Davis. 1997. X-Ray Fluorescence Analysis and Obsidian Hydration Rim Measurement of Artifact Obsidian from 35-DS-193 and 35-DS-201, Surveyor Fire Rehabilitation Project, Deschutes National Forest, Oregon. Report 1996-33 prepared for the Deschutes National Forest, Bend, Oregon, by Northwest Research Obsidian Studies Laboratory, Corvallis, Oregon.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Official Soil Series Descriptions [Online WWW]. Available URL: “http://soils.usda.gov/soils/technical/classification/osd/index.html” [Accessed 13 February 2007].

U.S. Fish and Wildlife Service. 2002. Chapter 14, Malheur Recovery Unit, Oregon. 71 p. In: U.S. Fish and Wildlife Service. Bull Trout (*Salvelinus confluentus*) Draft Recovery Plan. Portland, Oregon.

Wall, Travis; Vavra, Martin; Miller, Rick. 1999. Aspen Ecology and Rehabilitation in Eastern Oregon. An Annual Report of Preliminary Results and Progress.

Whiting, Beatrice B. 1950. Paiute Sorcery. Viking Fund Publications in Anthropology No. 15.

Whisenant, S.G. 1990. Changing Fire Frequencies on Idaho's River Plains: Ecological and Management Implications, P. 4-10. *In:* Proceedings: Cheatgrass Invasion Shrub Die-off, and Other Aspects of Shrub Biology and Management. USDA Forest Service Technical Report. Int-276. Ogden, Utah.

Wilde, J.D. 1985. Prehistoric Settlements in the Northern Great Basin: Excavations and Collections Analysis in the Steens Mountain Area, Southeastern Oregon. Ph.D Dissertation, Department of Anthropology, University of Oregon.

Winward, Alma H. 2000. Monitoring the Vegetation Resources in Riparian Areas. USDA Forest Service, Rocky Mountain Research Station. RMRS-GTR-47.

Young, M.K., R.B. Rader, and T.A. Belish. 1997. Influence of Macroinvertebrate Drift and Light on the Activity and Movement of Colorado River Cutthroat. Transactions of the American Fisheries Society 126: 428-437.

Zlatnik, Elena. 1999. Purshia tridentata. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2008, April 13].

Appendix A

PLANTS

Common Name	Scientific Name
Antelope Bitterbrush	*Purshia tridentata*
Balsam Roots	*Balsamorhiza sagittata* & *B. serrata*
Big Headed Clover	*Trifolium macrocephalum*
Biscuitroot	*Lomatium sp.*
Bluebunch Wheatgrass	*Pseudoroegneria spicata*
Bull Thistle	*Cirsium vulgare*
Canada Thistle	*Cirsium arvense*
Cheatgrass	*Bromus tectorum*
Crested Wheatgrass	Agropyron cristatum
Dalmatian Toadflax	*Linaria genistifolia spp. dalmatica*
Diffuse Knapweed	*Centaurea diffusa*
Douglas-Fir	*Pseudotsuga menziesii*
Fleabane	*Erigeron sp.*
Idaho Fescue	*Festuca idahoensis*
Junegrass	*Koleria macrantha*
Low Sagebrush	*Artemisia arbuscula*
Medusahead Rye	*Taeniatherum caput-medusae*
Milkvetch	*Astragalus sp.*
Mountain Big Sagebrush	*Artemisia tridentata* ssp. *vaseyana* Mountain
Mahogany	*Cercocarpus. ledifolius*
Mountain Snowberry	*Symphoricarpos oreophilus* Ponderosa Pine
	Pinus ponderosa
Quaking Aspen	*Populus tremuloides*
Rubber Rabbitbrush	*Chrysothamnus nauseosus*
Russian Knapweed	*Acroptilon repens*
Sandberg's Bluegrass	*Poa sandbergii*
Snowbrush	*Ceanothus velutinus*
Stiff Sagebrush	*Artemisia rigida*
Thurber's Needlegrass	*Achnatherum thurberianum*
Wax Currant	*Ribes cereum*
Western Juniper	*Juniperus occidentalis*
Western Needlegrass	*Achnatherum occidentalis*
White Top	*Lepidium draba*

ANIMALS

Common Name	Scientific Name
Badger	*Taxidea taxus*
Black-Tailed Jackrabbit	*Lepus californicus*
Bobcat	*Felis rufus*
Brewer's Sparrow	*Spizella breweri*
Mountain Cottontail	*Sylvilagus nuttallii*
Mountain Pine Beetle	*Dendroctonus ponderosae*
Cougar	*Puma concolor*
Coyote	*Canis latrans*
Dusky Flycatcher	*Empidonax oberholseri*
Golden Eagle	*Aquila chrysaetos*
Gray Flycatcher	*Empidonax wrightii*
Great Basin Redband Trout	*Oncorhynchus mykiss ssp.*
Greater Sage-Grouse	*Centrocercus urophasianus*
Lewis's Woodpecker	*Melanerpes lewis*
Loggerhead Shrike	*Lanius ludovicianus*
Mule Deer	*Odocoileus hemionus*
Northern Goshawk	*Accipitor gentilis*
Northern Pygmy Owl	*Glaucidium californicum*
Rocky Mountain Elk	*Cervus elaphus*
Olive-Sided Flycatcher	*Contopus cooperi*
Pileated Woodpecker	*Dryocopus pileatus*
Pine Engraver	*Ips spp.*
Pronghorn Antelope	*Antilocapra Americana*
Pygmy Nuthatch	*Sitta pygmaea*
Sage Sparrow	*Amphispiza belli*
White-Headed Woodpecker	*Picoides albolarvatus*
Western Pine Beetle	*Dendroctonus brevicomis*
Williamson's sapsucker	*Sphyrapicus thyroideus*

United States Department of Agriculture | Forest Service | Blue Mountains Pest Management Service Center Wallowa-Whitman NF | 1401 Gekeler Lane La Grande, OR 97850-3456 (541) 963-7122

APPENDIX B

File Code: 3420 **Date:** January 16, 2008
Route To:

Subject: Technical Assistance: Slickear Hazardous Fuel Reduction Project, Three Rivers Resource Area, Burns District, BLM

To: Three Rivers Resource Area Manager, and
District Manager, Burns BLM
28910 Hwy 20 West, Hines, OR 97738

On June 6, 2008, we were on the Burns District at the request of Jon Reponen for the purpose of reviewing a couple of project areas for forest health issues. This report will be for the proposed Slickear project. Proposed treatment opportunities include stocking level control, fuel treatment, aspen restoration and possibly juniper treatment in pine woodlands. During these evaluations we were primarily concerned with insect and disease occurrence and risk, recommended treatment options, and consequences of action and deferring treatment. During this field visit, we were joined by a number of district staff, especially folks from the fire shops. Jon Reponen organized and led this trip.

The Slickear project area is located west of Silvies and Emigrant Creeks, south of Skull Creek, in the Slickear Creek and Spring Draw areas. This is about 15 miles northwest of Burns. Conifers, primarily ponderosa pine and fewer Douglas-fir are mostly in draws and on northerly-facing slopes. Juniper, sagebrush, and bunchgrass characterize the more exposed aspects. Aspen are found mostly in riparian areas, moist draw bottoms, and a few talus slopes. About 1000 of the 4500 acres or so in the Slickear project are potential treatment areas.

We made several stops in representative stands within the proposed project area. These were primarily densely-stocked pine or pine/fir stands, with and without aspen. We were not particularly concerned with the exposed upland juniper-grassland-scarps on shallow soils, as these are not proposed for management. Much of the rest of the area is pine woodland (widely-spaced juniper and pine). We walked through these stands as a group and discussed conditions encountered and answered questions. We also dug up roots and removed the bark from representative dead and dying trees to confirm the causes of mortality.

The first area we visited was heavily logged in 1953 under a partial removal prescription that removed about 50% of the mature trees. As a result, there are three existing size/age classes; the original residual large old trees; advanced regeneration and small trees that were existing in 1953 and survived, which are now 16 to 18” trees; the

regeneration that resulted following removals over 50 years ago are now 4 to 6” dbh. Not all stands in this area were harvested. There has been no thinning or harvesting since the 1953 logging and most stands are excessively stocked. We measured basal area in several locations and 220 to 240 ft^2/acre was the rather consistent result. These stands historically burned at a rather frequent periodicity and fire suppression has eliminated this natural disturbance. It did not appear that these stands have experienced fire since the logging.

The two other areas we stopped had not had previous timber management. These areas had abundant young understory (Figure 1). Some areas without obvious disturbance for many decades had extremely thick duff accumulations beneath the larger trees. Where duff is deep, around a foot or more, mitigation must be considered before returning fire to an area. Dry duff that ignites tends to burn with a smoldering, long-lasting combustion that can injure tree roots and boles (Ryan and Frandsen, 1991), increasing the susceptibility of large trees to bark beetles, pathogens and drought (Wallin et al. 2003, McHugh et al. 2003).

Figure 1: Note large stem in background and abundant smaller trees all around. This area had no stumps, indicating very little cutting here in the past.

One commonly recommended method to reduce basal fire damage to trees with thick duff is to rake the duff away from the bole of the large trees. Raking reduces the damage to trees from smoldering combustion. The trees that seem most likely to suffer damage from large duff accumulations are those with the large bark plates that have bark flaking off and adding to the duff. Our recommendation is to rake around the boles of these large trees to a distance of at least 3 feet radius around the trunk. The duff should be evenly scattered and not left piled up at the edge of this radius. However, in some soils, raking has not reduced mortality. It is believed this is due to the damage caused to fine roots growing in the duff. Because raking has not been studied in our soils, an extra precaution would be to rake at least a year prior to burning to allow the fine roots to recover.

Plant associations that were noted or are likely to be represented in the Slickear area include Douglas-fir/mountain snowberry (Psme/Syor); Douglas-fir/elk sedge (Psme/Cage); ponderosa pine/mountain-mahogany/elk sedge (Pipo/Cele/Cage); ponderosa pine/mountain-mahogany/Idaho fescue-bluebunch wheatgrass

(Pipo/Cele/Feid-Agsp); ponderosa pine/pinegrass (Pipo/Caru); ponderosa pine bitterbrush/ Ross' sedge (Pipo/Putr/Caro); ponderosa pine/ bitterbrush/ elk sedge (Pipo/Putr/Cage); and ponderosa pine/ Idaho fescue (Pipo/Feid) (Johnson and Clausnitzer 1992). Stockability of ponderosa pine is related to bark beetle risks. Stands that maintain densities of pine that are excessive such that trees are impacted by reduced vigor will be susceptible to bark beetle attack and beetle-caused mortality during low and moderate population levels. Natural disturbances such as periodic ground fire, will reduce stocking and help to keep bark beetle risk low. Managed stocking level control has been used to reduce bark beetle risk generally in the absence of natural disturbances. Recommended stocking is dependent upon a number of factors, and current state-of-the-art recommendations are given by Cochran and others (1994) and Powell (1999). Stocking guidelines can be determined given the conifer species, quadratic mean stand diameter, plant community, and stand structure. Table 1. gives examples of stocking recommendations for representative plant associations of the Slickear area for ponderosa pine in even-aged structure where the quadratic mean stand diameter is 12 inches dbh.

Table 1. Recommended stocking for ponderosa pine where quadratic mean stand diameter is 12" dbh in even-aged structure (Cochran 1994; Powell 1999).

Plant Association	Upper Management Zone ft.^{2}/acre basal area	Lower Management Zone ft.^{2}/acre basal area
PSME/SYOR	102	68
PSME/CAGE	49	33
PIPO/CELE/CAGE	46	31
PIPO/CELE/FEID-AGSP	18	12
PIPO/CARU	87	58
PIPO/PUTR/CARO	52	35
PIPO/PUTR/CAGE	40	27
PIPO/FEID	36	27

Stockability varies mostly by plant community. Stands with larger diameter trees (quadratic mean stand diameters) have progressively higher stockability, while stands with smaller trees have progressively lower stockability.

We recommend taking overstocked stands down to near the lower management zone recommendation and scheduling stocking level control reentries or other treatment such as underburning, when stocking exceeds the upper management zone. In the Slickear area, target species and recommendations should generally be for ponderosa pine. Judging from our several measurements and observations of stocking, nearly all stands are currently overstocked by a factor of 2, 3, or even more.

Mountain pine beetle (*Dendroctonus ponderosae*) epidemics are a risk to overstocked small sawlog-size ponderosa pine. Risk is particularly high where basal area exceeds 150 ft.^{2}/acre and average tree diameter is 10" or more. These stands are generally at moderate risk to mountain pine beetle due to very high stocking but mostly smaller size classes of trees. Beetle activity can be expected to be sporadic during periods of low endemic populations. However, the numbers of these insects are very cyclic and they will periodically build to high populations. When plenty of susceptible hosts are available over a large area, they will eventually go into full-blown epidemic status while mortality becomes extensive. So, retaining the existing conditions, the beetle activity

can be expected to fluctuate and may increase to outbreak levels at any time. Outbreaks can originate here or elsewhere in the southern Blue Mountains, and insect-caused mortality will result in the Slickear area. Stocking level control will reduce the level of endemic beetle activity as well as reduce the damage that will result if the beetles go into epidemic status on the landscape.

Larger trees will often be attacked by western pine beetle (*D. brevicomis*), or a mix of western and mountain pine beetles when they experience drought, fire damage, or some other stressor that increases their susceptibility to attack. An incremental stressor on large trees is the growth of neighboring smaller trees competing for the same resources. Large trees are often more prone to dying after burning than young trees (Kolb et al. 2007) and one of the causes is root and bole damage that increases their attractiveness to western pine beetles. Western pine beetle populations have been high in the Blue Mountains for the past several years with the result that an increased number of older ponderosa pine trees have been killed. Targeting areas with large remnant ponderosa pine for restoration through removing competing trees and removing nearby duff and woody fuels will help perpetuate these old pines on the landscape.

It is apparent that while some mountain pine beetle-caused mortality had occurred in recent years, the levels of mortality are generally low compared to the existing risk. Thus, past mortality should not be used to gauge what could happen in the future.

We visited a few areas that had had pine engraver (*Ips spp*.) activity in the past but saw nothing current. *Ips* beetles generally restrict themselves to feeding on tree tops and smaller diameter (>5") trees. Severely crowded trees will sometimes be attacked but populations usually do not get very large nor do they continue to expand. Unlike most of the other bark beetles, this bark beetle does not require a living host for reproduction. Therefore, it is most commonly a problem during or after thinning or logging operations that leave green slash behind for the beetle to breed in. *Ips* beetles emerge from overwintering sites as early as April in some areas and have 2-3 generations a year. If they emerge and find nearby green slash, this provides prime breeding habitat and thus causes their populations to expand. When this next population emerges about 6 weeks later, it is now numerous enough to successfully attack and kill nearby standing green trees. To avoid this scenario, we recommend not creating, or treating or removing, logging or thinning slash created from January through July. Populations that emerge in the spring will thus decline when optimum breeding sites are not available. This is not fool-proof, sometimes in dry years slash created in the late summer has led to nearby tree mortality.

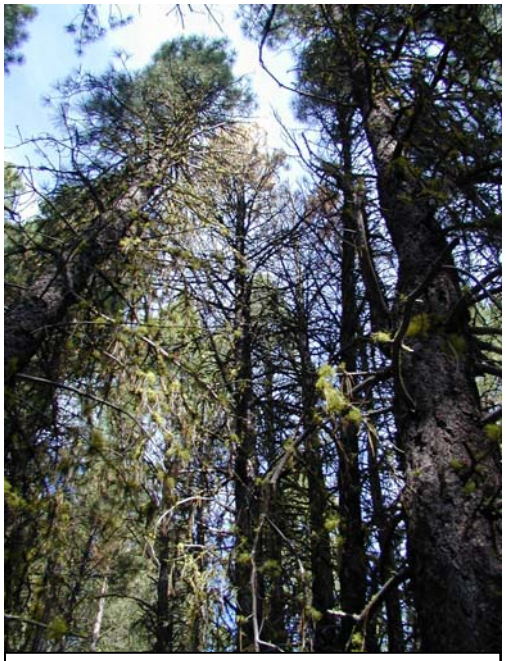

Figure 1. Standing blackstain root disease-caused mortality.

One large center of mountain pine beetle activity was encountered at the first stop we made at Slickear. Some of the characteristics of this activity did not look quite right so we looked closely as several of the recently-killed and one

Figure 2. Black stain root disease center.

or more obviously declining trees and confirmed the presence of blackstain root disease (*Leptographium wageneri*). Blackstain root disease is very easy to miss, since bark beetles are nearly always involved in killing diseased trees and their signs and symptoms are much more visible. Presence of blackstain is indicated by mortality having occurred over many years, usually with evidence of enlarging and expanding centers of mortality (Figures 1 and 2). Prior to be being attacked by beetles, the crown may appear sparse, with shorter-than normal needles and reduced retention of older needles.

Bark beetles, on the other hand, typically kill trees in groups over a two or three year period. In this case, mortality had occurred over a longer time-frame than is typical for bark beetles working alone. We were able to confirm the presence of root disease by chopping into the root collar of several declining and recently-killed pines and exposing the characteristic black-stained sapwood. We did not confirm blackstain at any other stops in the Slickear area, so it may not be prevalent in this proposed project area. However, we made no attempt to systematically survey the area. This conjecture is based solely on our limited observations in a walk-through reconnaissance through several of the pine-dominated areas. Blackstain root disease is especially common on Forest Service lands east of Highway 395 on the southern portion of the Malheur National Forest. We have confirmed some presence of blackstain most times we have reviewed ponderosa pine stands on the Burns District, BLM.

Existing fuels, additional fuel loading which can be expected from beetle-caused mortality in the future if treatment is deferred, and treatment of project fuels which will result from thinnings, all need to be addressed in this proposed project plan.

One or more clones of quaking aspen were noted in the draw bottom between Slickear Creek and Spring Draw. The larger stems in this community had a high incidence of

Figure 3. Conks of *Phellinus tremulae,* cause of white trunk rot

Figure 4. Excavation by a cavity-nesting bird on an aspen with white trunk rot.

Figure 5. Decline in aspen clone vigor; conifer invasion, mortality with little or no recruitment.

decay, stem cankers and associated mortality. This condition in itself is often normal for mature stems and is characteristic of the short-lived nature of aspen stems. White trunk rot, caused by *Phellinus tremulae* is quite common in Blue Mountain aspen, and it was confirmed at Slickear (Figure 3). Several trees were observed with conks of the fungus, which confirm infection and decay. Trees with conks have a column of decay that is a soft white rot. Cavity-nesting birds often excavate their cavities in these trees, and it is

common to see bird holes on live trees with conks (Figure 4). Other trees were dead or had the tops dead or sometimes broken out. This is often caused by one of several canker diseases that are common in the Blue Mountains. Cytospora canker (*Cytospora chrysosperma*); Sooty-bark canker (*Encoelia pruinosa*); Ceratocystis canker (*Ceratocystis fimbriata*); and Cryptosphaeria canker (*Cryptosphaeria lignyota*) are all known to be active in this area. These are native diseases and incidence increases as stems mature. Broken topped trees will remain standing for years and are used as snags by wildlife. Aspen stands can be considered healthy even if they have a high incidence of these diseases in older stems, as long as mortality is being adequately replaced by new suckers. Level of infection of many to most of these diseases is related to clone susceptibility.

At Slickear, there was evidence of several universally common factors of Blue Mountain aspen clone deterioration and poor health. Conifers, especially ponderosa pine, have invaded traditionally aspen-dominated sites (Figure 5). Secondly, recruitment and development of suckers is not occurring fast enough to replace large stem mortality (Figure 5 and 6). Thirdly, there is evidence that the area occupied by the clone is shrinking or retreating (Figure 6). There is historical evidence that contemporary aspen communities have retreated to their moist-site refuges due to a combination of grazing, fire suppression, and conifer invasion.

Aspen is quite different from other hardwoods, including other members of Populus, in the Blue Mountains; black cottonwood, water birch, mountain alder, and bitter cherry reproduce vegetatively using sprouts produced from the lower stem area of mature trees, whereas vegetative reproduction for aspen occurs almost exclusively as suckers from an individual, often very large, root system. Reproduction by root suckers maintains the perpetuation of the clone root structure, which can be thousands of years old. Interactions between two different plant growth hormones, auxin produced in the stem and cytokinin produced in the roots, regulates sucker production. Apical dominance is controlled by auxin, and movement into the roots is stopped or curtailed by cutting, burning, girdling, killing, or defoliation, auxin levels in the roots rapidly decline, removing the suppression of sucker production.

Figure 6. Evidence of contacting clones; dead and down stems on microsites with no existing live aspen

Aspen exhibits a fantastic degree of genetic variation expressed as phenotypic differentiation; leaf shape and size, bark color, branching habit, autumn leaf color, disease resistance, as well as other factors can vary by clone. Oftentimes adjoining clones can be recognized by these differences. In some cases clones will overlap.

Disturbance that initiates sucker development is dependent upon carbohydrate reserves stored in the root system to supply the energy needed for sucker production and early development. In declining clones where vigor is especially poor, these reserves may be insufficient to allow successful sucker production and survival. Examples of clones of poor vigor are those with the large stems dying and breaking due to canker and stem decay diseases *while* conifers are invading *and* sucker survival is poor, often due to ungulate browsing. Fortunately, this drawbottom Slickear clone still retains a number of large stem components, but it is declining, there is inadequate recruitment to replace dying stems and the clone is compressing, and without restoration or natural disturbance before conditions have deteriorated too far, this clone could be lost in the not-to-distant future.

Restoration strategies include killing remaining overstory aspen stems, thus stopping auxin production and translocation, in order to promote a new cohort of young stems. This is somewhat risky and requires an existing clone with enough vigor and carbohydrate reserves that ample sucker production will result. If not, the clone can be lost.

In the northern Rocky Mountains, a fire interval periodicity of 20 to 130 years is reported as necessary to maintain aspen forests (Noble and Slatyer 1980). There is no reason to believe that that time span is not applicable in the Blue Mountains.

Conifer removal is highly recommended in nearly all cases of proposed aspen restoration. There are at least several impacts conifers exert over aspen. One of course is simply site occupancy and the invasion of relatively shade-tolerant conifers onto sites of very shade-intolerant aspen. While part of this is simply related to the invasion of traditional aspen communities by the invading conifer, there are other reasons as well. Research has shown that small conifers exhibit greater water stress (midday xylem water potential) when growing under a conifer overstory than an aspen overstory (citation). Research also demonstrates that large conifers use more soil moisture than large aspens (Schimpf and others 1980). In other words, conifers out-compete aspen for moisture, which is especially significant in dry communities that characterize the southern Blue Mountains.

Fencing is often included with other activities in an integrated aspen restoration plan. The primary reason fences are built is to allow suckers to develop without being browsed. Browsing is very frequently severe and may prevent any suckers from developing normally. Most common fences have been lodgepole pine buck-and-pole designs, which are effective in keeping both bovines and elk out of enclosures. Other designs are New Zealand deer fence and modifications of multiple-strand wire fence. Bringing in material would likely be needed here, as on-site ponderosa pine may not be suitable fence building material.

Other designs and strategies can achieve similar results to fencing. Conifers left on-site that protect suckers can be effective. This has included slash piles designed to create barriers, discouraging ungulate access to suckers. Another effective method is to fell trees on high stumps but do so such that the boles remain attached to the stump to for a “hinge”. This can be done on pole-size trees by eliminating a face cut and using a back cut 3 or 4 feet off the ground. These can effectively reduce access by making it rather difficult. This treatment or techniques have been most effective when they were kept small, encouraging native ungulates to go around them rather than through them

(Shirley and Erickson 2001). Powell (2007) compiled some of the information and literature citations for aspen applicable to the Blue Mountains and referenced and used in this report. The Umatilla National Forest also has some specifics available on fencing (http://www.fs.fed.us/r6/uma/nr/native-plants/aspen/buckandpole.pdf).

There is a complex interrelationship between stand structure, historic fire effects, insect and disease activity and fuel loading. This has been the subject of much research, numerous journal articles, and at least a few symposia. Common consensus is that dry pine communities were frequently visited by light ground fires that kept stocking much lower than currently occurs and fuel accumulations were light (Hessburg and others 2005). Stand replacement fire events were infrequent because of the light fuels and widely-spaced trees (Heyerdahl and Agee 1996). Bark beetles readily respond to overstocked conditions and current conditions are believed to result in substantially greater bark beetle-caused mortality than historically occurred. Higher fuel levels, especially vertical fuel, combined with higher accumulated fuels, gives the potential for fire events which are beyond the historical norm, resulting in hotter fires and often catastrophic fires (Agee 1994). Changes that have occurred in diseases to ponderosa pine are less clear. Under current conditions, dwarf mistletoe (*Arceuthobium ponderosae*) has increased in severity in stands that are infested, although western dwarf mistletoe was not observed in the Slickear. We believe root diseases, especially blackstain and armillaria (*Armillaria ostoyae*) root diseases, have increased in both incidence and severity, but this is difficult to confirm.

Western juniper encroachment into savanna and transitional forest is well documented and contributes to changes in vegetation and available moisture (Gedney and others 1999). While associated pines are often killed by beetles, junipers seem relatively immune to insect and disease-caused mortality.

Proposed treatments in the pine stands and possibly some of the pine woodlands tentatively involve a strategy to maintain and sustain the large old pine component. This would include removal of smaller (generally post-fire suppression vintage) trees from around the large older residuals. Merchantable trees would be harvested and sub-merchantable trees would be machine piled and burned. About 5 years later a broadcast burn would be done as well. Research in recent years has established that reducing basal area around large old pines increases their vigor as well as their rates of growth (McDowell and others 2003; Latham and Tappeiner 2002). While not reported, longevity likely increases as well, as inferred from documented increase in vigor.

We are available to assist the BLM with any insect/disease management issue. Please contact us if there are any questions regarding this report.

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References and Literature Cited

Agee, James K. 1994. Fire and weather disturbances in terrestrial ecosystems of the eastern Cascades. Gen. Tech. Rep. PNW-GTR-320. Portland, OR: USDA Forest Service, Pacific Northwest Research Station. 52 p. (Everett, Richard L., assessment team leader; Eastside forest ecosystem health assessment; Hessburg, Paul F., Sr., science team leader and tech ed., Volume III: assessment.)

Cochran, P.H., Geist, J.M., Clemens, D.L., Clausnitzer, R.R., and Powell, D.C. 1994. *Suggested stocking levels for forest stands in northeastern Oregon and southeastern Washington.* Research Note PNW-RN-513; USDA Forest Service, Pacific Northwest Research Station, Portland, OR

Gedney, Donald R.; Azuma, David L.; Bolsinger, Charles L.; McKay, Neil. 1999. Western juniper in eastern Oregon. Gen. Tech. Rep. PNW-GTR-464. Portland, OR: USDA Forest Service, Pacific Northwest Research Station. 53 p.

Hessburg, Paul F., Agee, James K., Franklin, Jerry F. 2005. Dry forests and wildland fires of the inland Northwest USA: Contrasting the landscape ecology of the pre-settlement and modern eras. Forest Ecology and Management 211: 117-139.

Heyerdahl, Emily K., and Agee, James K. 1996. Historical fire regimes of four sites in the Blue Mountains, Oregon and Washington. Un-numbered final report. Seattle WA: University of Washington, College of Forest Resources.173 p.

Johnson, Jr., and Clausnitzer, R.R. 1992. *Plant associations of the Blue and Ochoco Mountains*. USDA Forest Service, Pacific Northwest Region, Wallowa-Whitman National Forest. Report R6-FRW-TP-036-92

Latham, P., Tappeiner, J. 2002. Response of old-growth conifers to reduction in stand density in western Oregon Forests. Tree Physiology 22: 137-146.

McDowell, N., Brooks, J.R., Fitzgerald, S.A., and Bond, B.J. 2003. Carbon isotope discrimination and growth response of old *Pinus ponderosa* trees to stand density reductions. Plant, Cell and Environment 26: 631-644.

McHugh, C.W., Kolb, T.E., & Wilson, J.L. (2003) Bark Beetle Attacks on Ponderosa Pine Following Fire in Northern Arizona. Environmental Entomology, 32:510-522.

Noble, I.R.; Slatyer, R.O. 1980**.** The use of vital attributes to predict successional changes in plant communities subject to recurrent disturbances. Vegetatio. 43: 5-21.

Powell, David C. 1999. Suggested stocking levels for forest stands in Northeastern Oregon and Southeastern Washington: An implementation guide for the Umatilla National Forest. USDA Forest Service, Pacific

Northwest Region, Umatilla National Forest Rept. F14-SO-TP-03-99. 300p. http://www.fs.fed.us/r6/uma/nr/silv/stockingpub1.pdf

Powell, David C. 2007. Comments about aspen communities at Elk Flats. Letter to the District Ranger, Walla Walla Ranger District, Umatilla National Forest, File Code 2470, dated November 8, 2007 from the Umatilla National Forest Silviculturist. On file at the Supervisors Office, Umatilla National Forest, Pendleton, OR, and the Walla Walla Ranger District, Umatilla National Forest, Walla Walla, WA.

Ryan, K.C. & Frandsen, W.H. (1991) Basal Injury from Smoldering Fires in Mature *Pinus Ponderosa* Laws. International Journal of Wildland Fire, 1:107-118.

Schimpf, D.J.; Henderson, J.A.; MacMahon, J.A. 1980. Some aspects of succession in the spruce-fir forest zone of northern Utah. Great Basin Naturalist. 40(1): 1-26.

Shirley, D.M.; Erickson, V. 2001. Aspen restoration in the Blue Mountains of northeast Oregon. In: Shepperd, W.D.; Binkley, D.; Bartos, D.L.; Stohlgren, T.J.; Eskew, L.G., compilers. Sustaining aspen in western landscapes: symposium proceedings. Proceedings RMRS-P-18. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 101-115.

Wallin, K.F., Kolb, T.E., Skov, K.R., & Wagner, M.R. (2003) Effects of Crown Scorch on Ponderosa Pine Resistance to Bark Beetles in Northern Arizona. Entomological Society of America, 32:652-661.

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APPENDIX C

File Code: 3420 **Date:** January 29, 2008
Route To:

Subject: Technical Assistance: Claw Creek Project, Three Rivers Resource Area, Burns District, BLM

To: Three Rivers Resource Area Manager, and
District Manager, Burns BLM
28910 Hwy 20 West, Hines, OR 97738

On June 6, 2007, we were on the Burns District at the request of Jon Reponen for the purpose of reviewing a couple of project areas for forest health issues. This report will be for the proposed Claw Creek project. Proposed treatment opportunities include stocking level control, enhancement of large ponderosa pine vigor and growth by removing adjacent understory, project fuel treatment, and subsequent underburning. During these evaluations we were primarily concerned with insect and disease history, occurrence and risk, recommended treatment options, and consequences of action and deferring treatment. During this field visit, we were joined by a number of district staff, especially folks from the fire shop. Jon Reponen organized and led this trip.

The Claw Creek area is west of Emigrant Butte in the upper portions of Claw and Egypt Creeks. These are multi-Section blocks of BLM ground with several sections and partial sections of private holdings, all surrounded by Ochoco National Forest. We spent a few hours in this area, accessing it via the Claw Creek road.

There are approximately 1000 acres of stand type that would benefit from the proposed treatment within this area. Vegetation and plant community vary by aspect, slope and soil depth. Conifers, mostly ponderosa pine (and scattered juniper) are most densely stocked in draws and northerly- and easterly-facing aspects on moderate slopes. The remainder of the area is stocked with well-spaced pines and junipers in pine woodland communities. Plant Associations represented in Claw Creek probably include: Ponderosa pine/mountain-mahogany/elk sedge (PIPO/CELE/CAGE); Ponderosa pine/mountain-mahogany/Wheeler's bluegrass (PIPO/CELE/PONE); Ponderosa pine /bitterbrush/Ross'sedge (PIPOPUTR/CARO); Ponderosa pine/bitterbrush/elk sedge (PIPO/TUTR/CAGE); Ponderosa pine/elk sedge (PIPO/CAGE); Ponderosa pine/ pinegrass (PIPO/CARU), and perhaps other similar associations.

Historical management of this area includes two commercial harvest entries; one in 1952 and a second in 1966, and some thinnings in 1967 and 1968. The 1952 entry was essentially a heavy partial removal, and the second entry included some regeneration treatments. Most of the area was not thinned. Fire exclusion has of course been

practiced here for at least a century. We did not estimate the time since the last natural fire(s) in this area, but it has been many decades. We made several stops in representative stands within the proposed project area. These were primarily the densely-stocked pine stands. We were not particularly concerned with the more open pine-woodlands, or the pine-juniper and pine-grasslands on shallow soil and exposed aspects.

As a result of past disturbance, generalizations about existing stand structure can be made. Large, old single ponderosa pines are scattered throughout the area with a younger age class cohort of understory pines. Blackbark pines that are now 16 to 18" dbh were mostly advanced regeneration when the 1952 harvest was made. These trees are now a co-dominant structure in the stand and clearly younger and smaller than the residual overstory. A third structure consists of the regeneration that resulted from the 1952 removals and these are now 4 to 8" dbh poles and small sawlogs. We measured basal area in several locations and stocking averaged roughly about 240 ft^2/acre.

Stockability of ponderosa pine is related to bark beetle risks. Stands of pine with densities that are excessive for the productivity of the site such that trees are impacted by reduced vigor will be susceptible to bark beetle attack and beetle-caused mortality during low and moderate population levels of the beetles. Natural disturbances such as periodic ground fire reduces stocking and helps to keep bark beetle risk low. Managed stocking level control is widely used and the most accepted management strategy to reduce bark beetle risk in the absence of natural disturbances. Recommended stocking is dependent upon a number of factors, and current state-of-the-art recommendations are given by Cochran and others (1994) and Powell (1999). Stocking guidelines can be determined given the conifer species, quadratic mean stand diameter (QMD), plant community, and stand structure. Table 1. gives examples of stocking recommendations for representative plant associations of the Claw Creek area for ponderosa pines in even-aged structure where the quadratic mean stand diameter is 14 inches dbh.

Table 1. Recommended stocking bounds for ponderosa pine where quadratic mean stand diameter is 14" dbh in even-aged structure (Cochran et al. 1994; Powell 1999).

Plant Association	Upper Management Zone $ft.^2$/acre basal area	Lower Management Zone $ft.^2$/acre basal area
PIPO/CELE/CAGE	48	32
PIPOPUTR/CARO	54	36
PIPO/PUTR/CAGE	41	27
PIPO/CAGE	48	32
PIPO/CARU	90	60

Potential stocking varies mostly by plant community and stands with larger diameter trees (quadratic mean stand diameters) are able to maintain higher stocking in terms of basal area, and stands with smaller trees similarly are able to maintain lower stocking.

Table 1. shows rather consistent stocking guidelines for associations other than PIPO/CARU, which is substantially higher than the rest. Regardless, all or nearly all stands in Claw Creek are overstocked, usually by a factor of several times.

We recommend taking overstocked stands down to near the lower management zone designated for that plant association and quadratic mean stand diameter and scheduling stocking level control reentries or other treatment such as underburning, when stocking eventually exceeds the upper management zone. In the Claw Creek area, target species and recommendations should be for ponderosa pine. Removing trees under 10" diameter would decrease the basal area in most stands to 40-80ft^2/acre, approximating the Lower Management Zone recommended by Cochran and others (1994).

Risk to overstocked small sawlog-size ponderosa pine is highest with mountain pine beetle (*Dendroctonus ponderosae*). Larger individuals will often be attacked by western pine beetle (*D. brevicomis*), or a mix of western and mountain pine beetles. Bark beetle activity can be expected to be sporadic during periods of low endemic populations under the existing stand conditions. However, the numbers of these insects are very cyclic on the landscape level and they will periodically build to high populations. When plenty of susceptible hosts are available over a large area, they will eventually go into full-blown epidemic status and mortality will become extensive. Retaining the existing conditions, the beetle activity can be expected to fluctuate, with pockets of mortality occurring in some years and the possibility of extensive mortality during an outbreak. Outbreaks can originate here or elsewhere in the southern Blue Mountains.

There is some evidence that mountain pine beetle attacks begin in the more dense areas of ponderosa pine stands. Dense microcosms provide the optimum habitat for beetles to find suitable trees (Schmid & Mata, 2005). Within these microcosms, the more susceptible trees receive the initial attacks. Continued infestation appears to be dependent on trees per acre (over 200), basal areas between 150-250ft^2/ac, intermediate QMD values, and low minimum dbh (Olsen et al., 1996).

With uneven-aged stands, these pockets of mountain pine beetle-caused mortality will continue to contribute to small openings and patchy fuels. Stocking level control that addresses these dense microcosms will reduce the level of endemic beetle activity as well as reduce the damage that will result if the beetles go into epidemic status on the landscape. Removing stocking from below will raise the minimum dbh, decreasing the proportion of highly susceptible trees in the stand.

We noted a number of older bark beetle-caused mortality pockets throughout stands in Claw Creek (Figures 1 and 2). These consisted of 5 to 25 dead down and dead standing trees in mostly concise groups. As with most beetle pockets, trees showed evidence that they had died roughly about the same time based on degree of bark sloughing. While most of these pockets did not appear to have associated blackstain root disease (*Leptographium wageneri*), we checked and were unable to confirm any infection in those pockets investigated, although there is blackstain in similar stands in this portion of the Blue Mountains.

Existing fuels, additional fuel loading which can be expected from beetle-caused mortality in the future if treatment is deferred, and treatment of project fuels, which will result from thinnings, all need to be addressed in this proposed project plan.

There is a complex interrelationship between stand structure, historic fire effects, insect and disease activity and fuel loading. This has been the subject of much research,

numerous journal articles, and at least a few symposia. Common consensus is that dry pine communities were frequently visited by light ground fires that kept stocking much lower than currently exists and fuel accumulations were generally light. Stand replacement fire events were infrequent because of the light fuel loading and widely-spaced trees. Since bark beetles readily respond to overstocked conditions current conditions are believed to result in substantially greater bark beetle-caused mortality than historically occurred. Accelerated beetle-caused mortality is increasing fuel loads. Higher fuels, especially vertical fuel, combined with higher accumulated fuels, gives the potential for fire events which are beyond the historical norm, resulting in hotter fires and often catastrophic fires (Agee 1994).

Figure 1. Bark beetle-caused mortality.

Changes that have occurred in the incidence and severity of ponderosa pine diseases are less clear. Under current conditions, western dwarf mistletoe (*Arceuthobium campylopodum*) has increased in severity in those stands that are infested. In Claw Creek, we noted that dwarf mistletoe infested some of the stands. We did not have time to determine what stands were infected or estimate the severity of infection. This information could be collected during stand reconnaissance or treatment layout. It would certainly affect the treatment prescription.

Western dwarf mistletoe affects its host in several ways. Growth and vigor is reduced relative to the severity of infection. Severely-infected pines on poor sites have substantially higher rates of mortality. Similar trees on better quality sites are less apt to be directly killed by infestation. Infected trees will develop brooms which often persist in the lower crown. These have higher resin content and will catch and retain needles and debris, making them rather flammable. Coupled with stagnation of growth, especially of smaller understory trees, fuel laddering tends to develop in these infested stands. In short; mistletoe-infested stands have higher fuels and are structurally more prone to damage in the event of fire, especially if fire is long-overdue.

Figure 2. More bark beetle-caused mortality.

Stands that are most apt to develop severe infestation and be damaged are those pure pine stands that are mixed aged or have mixed canopy levels. These stands will readily develop following selection harvests or partial removals where infected trees are left as residuals. Infected overstory residual trees overtop subsequent regeneration that develops and spread mistletoe seeds onto these smaller trees every year in the fall.

For many years, recommended management for infected stands was a complete sanitation removal of infected trees, both large and small. Retaining some broomed trees over the landscape is now recognized as benefiting birds and small mammals that use brooms as cover and for nesting sites.

Recommended management strategies for mistletoe-infected stands have more recently focused on removing overstory sources of infection followed by the selection, spacing and release of least-infected individuals in the stand. Dwarf mistletoe-infected pine stands should be reduced to a single canopy layer to be effectively treated. At least, assure that overstory sources of infection are minimized as much as possible. If overstory large trees that are infected are retained, treatment efficacy will be reduced. Trees to be retained should have no dwarf mistletoe infections in the upper one-third to one-half of the live crown. Spacing associated with removals and sanitation will increase the growing space for residuals. Given recommended growing space, trees with the upper portion of their crowns free of dwarf mistletoe infection will grow similarly to uninfected trees with good form as well. Schmitt (1996) thoroughly discusses western dwarf mistletoe biology and management.

Western juniper encroachment into pine woodlands is well documented and contributes to changes in stand structure and distribution of ponderosa pine. Pines growing on sites with an invading and enlarging juniper component will have increasingly less available moisture (Gedney and others 1999). While associated pines are often killed by beetles, junipers seem relatively immune to insect and disease-caused mortality.

Proposed treatments in the pine stands and possibly some of the pine woodlands tentatively involve a strategy to maintain and sustain the large old pine component. This would include removal of smaller (generally post-fire suppression vintage) trees from around the large older residuals. Large trees are widely scattered and the larger second growth pine that are 16 to 18” dbh would be retained. Smaller trees in the understory would be deemed excess and removed. No merchantable removals would be expected with this treatment prescription. Project and existing fuels would be piled and burned. About 5 years later a broadcast burn would be done as well. Research in recent years has established that reducing basal area around large old pines increases their vigor as well as their rates of growth (McDowell and others 2003; Latham and Tappeiner 2002). While not reported, longevity likely increases as well, as inferred from documented increase in vigor.

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References and Literature Cited

Agee, James K. 1994. Fire and weather disturbances in terrestrial ecosystems of the eastern Cascades. Gen. Tech. Rep. PNW-GTR-320. Portland, OR: USDA Forest Service, Pacific Northwest Research Station. 52 p. (Everett, Richard L., assessment team leader; Eastside forest ecosystem health assessment; Hessburg, Paul F., Sr., science team leader and tech ed., Volume III: assessment.)

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Gedney, Donald R.; Azuma, David L.; Bolsinger, Charles L.; McKay, Neil. 1999. Western juniper in eastern Oregon. Gen. Tech. Rep. PNW-GTR-464. Portland, OR: USDA Forest Service, Pacific Northwest Research Station. 53 p.

Johnson, Jr., and Clausnitzer, R.R. 1992. *Plant associations of the Blue and Ochoco Mountains*. USDA Forest Service, Pacific Northwest Region, Wallowa-Whitman National Forest. Report R6-FRW-TP-036-92

Latham, P., Tappeiner, J. 2002. Response of old-growth conifers to reduction in stand density in western Oregon Forests. Tree Physiology 22: 137-146.

McDowell, N., Brooks, J.R., Fitzgerald, S.A., and Bond, B.J. 2003. Carbon isotope discrimination and growth response of old *Pinus ponderosa* trees to stand density reductions. Plant, Cell and Environment 26: 631-644.

Noble, I.R.; Slatyer, R.O. 1980**.** The use of vital attributes to predict successional changes in plant communities subject to recurrent disturbances. Vegetatio. 43: 5-21.

Olsen, W.K., Schmid, J.M., & Mata, S.A. (1996) Stand Characteristics Associated with Mountain Pine Beetle Infestations in Ponderosa Pine. Forest Science, 42:310-326.

Powell, David C. 1999. Suggested stocking levels for forest stands in Northeastern Oregon and Southeastern Washington: An implementation guide for the Umatilla National Forest. USDA Forest Service, Pacific Northwest Region, Umatilla National Forest Rept. F14-SO-TP-03-99. 300p.

Schimpf, D.J.; Henderson, J.A.; MacMahon, J.A. 1980. Some aspects of succession in the spruce-fir forest zone of northern Utah. Great Basin Naturalist. 40(1): 1-26.

Schmid, J.M. & Mata, S.A. (2005) Mountain Pine Beetle-Caused Tree Mortality in Partially Cut Plots surrounded by Unmanaged Stands. USDA Forest Service Proceedings, RMRS-RP-54.

Schmitt, Craig L. 1996. BMPMZ Management Guide: Management of ponderosa pine infected with western dwarf mistletoe in Northeastern Oregon. Rept. BMZ-96-07. Baker City, OR: USDA Forest Service, Pacific Northwest Region Blue Mountains Pest Management Zone, Wallowa-Whitman National Forest. 24 p.

APPENDIX D

Proposed Action Activity Descriptions

Prescribed Burning

Prescribed burning would be used to varying degrees in all four dominant vegetative communities. These treatments would include activities such as broadcast burning, piling and burning, jackpot burning, and underburning.

Burning prescriptions[1] would vary depending on specific management objectives and would only allow fire behavior adequate to reduce the stocking of fully and partially developed juniper woodlands on rangelands, or reduce natural and activity generated fuels in pine dominated forests and woodlands. Broadcast and jackpot burning would be the most widely applied burning activities under the proposed action in mountain big sagebrush/bunchgrass communities that are being encroached upon by juniper. Broadcast burning 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. 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 impacts on soils. Jackpot burning may also be utilized as pre-treatment 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[2] near a unit or property boundary. 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. All treated forested areas will probably receive piling burning treatments. Treated forested areas are also likely to receive an underburning treatment 5 to 7 years after the mechanical treatments.

Although the target treatment areas consist of the sections of the Claw Creek and Skull Creek Grazing Allotments that form the project areas, 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, the burn boss and resource advisors onsite would determine if suppression actions are warranted.

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[1] **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.

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

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 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 or fuels reduction objectives. Broadcast burning would be use an optional treatment method in mountain big sagebrush/bunchgrass communities.

Portions of these communities that are in the middle to late juniper woodland transitional stages would require a mechanical pre-treatment 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 the large trees 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 pre-treatment activities that may occur within or near broadcast burn units include wetlining[3], blacklining[4], 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 pre-treatment 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.

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[3] **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.

[4] **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.

The scheduling of the burning during the 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 burned in a given year.

Underburning

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 (duff, litter, twigs, branches <3 inches). Underburning would be applied primarily in the treated forested stands. Underburning would occur during the spring or fall. Pre-treatment of the burning areas could be necessary to reduce the risk of escapement or resource damage during underburning. The pre-treatment would include activities such as establishing blacklines or constructing handline around the perimeter of leave islands or adjacent to burn unit boundaries. Pretreatment activities may also include the raking or removal of duff around large trees, snags, and downed wood.

Figure 1: Example of low intensity forest underburn.

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 or dozers. Hand piles are usually constructed of bucked[5] 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. All piles would be burned within 2 years of construction during the fall or winter months of the year (September to December). Burning hand piles and machine piles would be an activity that would occur in the treated forested. Piling and burning may be implemented as a secondary treatment under the mountain big sagebrush/bunchgrass treatment areas. Any rangelands impacted by a piling and burning activity would require perennial grass seeding to guard against an invasion of exotic species.

[5] **Bucking:** Cutting tree boles and branches to lengths that can be moved by hand.

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.

Figure 2: Results of an early season jackpot burning treatment.

Jackpot burning would be the principal activity employed under the low/stiff sagebrush communities. It would also be one of the principal activities in mountain big sagebrush/bunchgrass communities especially where mountain mahogany and bitterbrush are prevalent. Mechanically cutting and jackpot burning the slash will remove the encroaching vegetation while retaining desirable existing shrubs and herbaceous species.

Mechanical Thinning and Cutting

Variable density thinning would be the primary activity applied in the forested units. 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. 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 (less than 11 inches diameter) to reduce fuel laddering and/or help achieve specific resource objectives. Noncommercial thinning would be accomplished with chainsaws 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 trees (greater than or equal to 11 inches diameter) 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 would be performed using ground-based equipment such as mechanical harvesters, tractors, and rubber-tired skidders. 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 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.

Appendix E

The Five Fire Regimes

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);

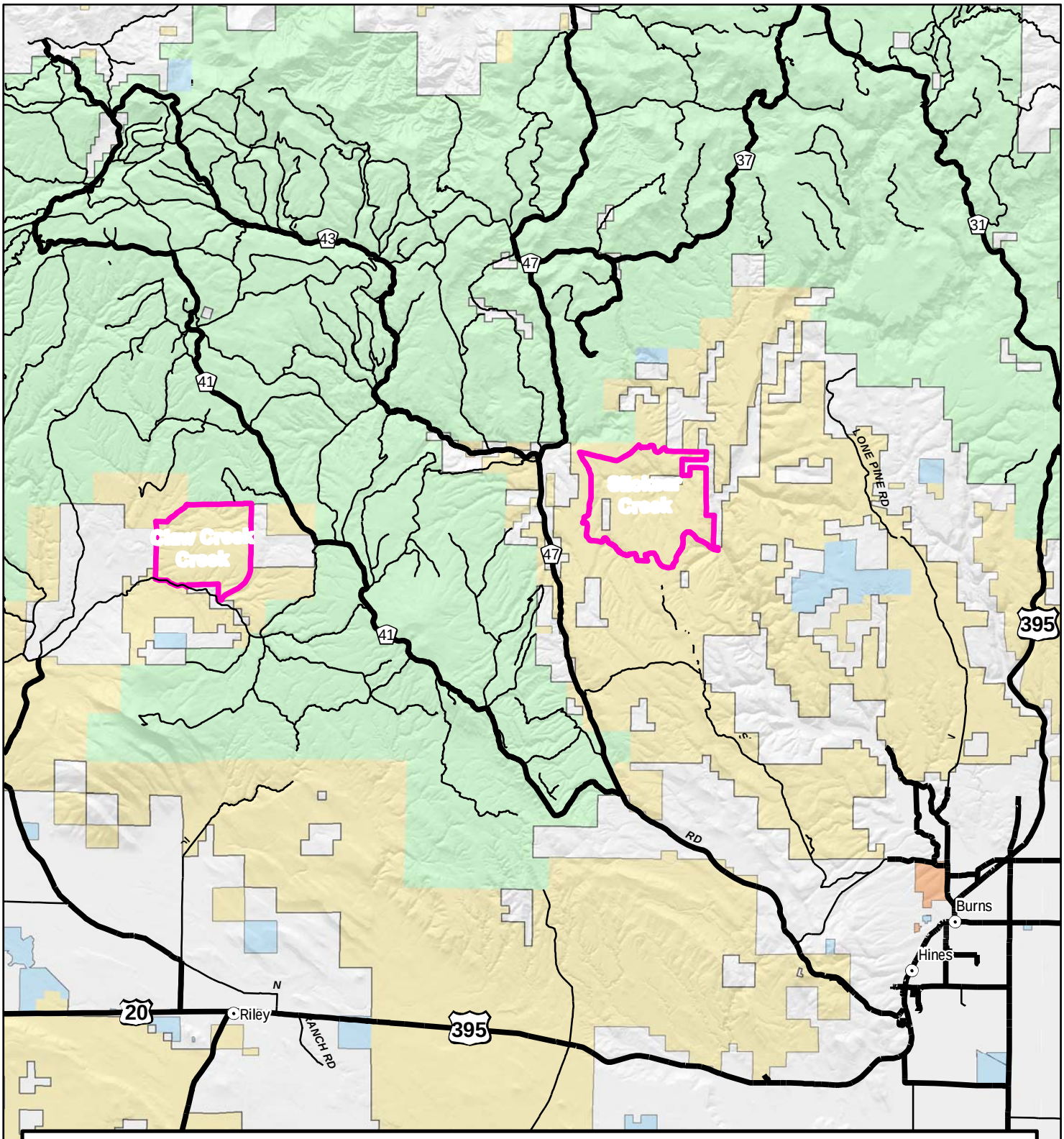
III) 35-100+ year frequency and mixed severity (less than 75 percent of the dominant overstory vegetation replaced);

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.

Fire Regime Condition Classes (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.



Map 1: Slickear / Claw Creek Project Area Vicinity Map

- Paved Road
- Non-Paved Improved Road
- Project Area Boundary
- BLM Land
- State Land
- U.S. Forest Service Land
- Indian Reservation
- Private Land

0 1.5 3 6 Miles

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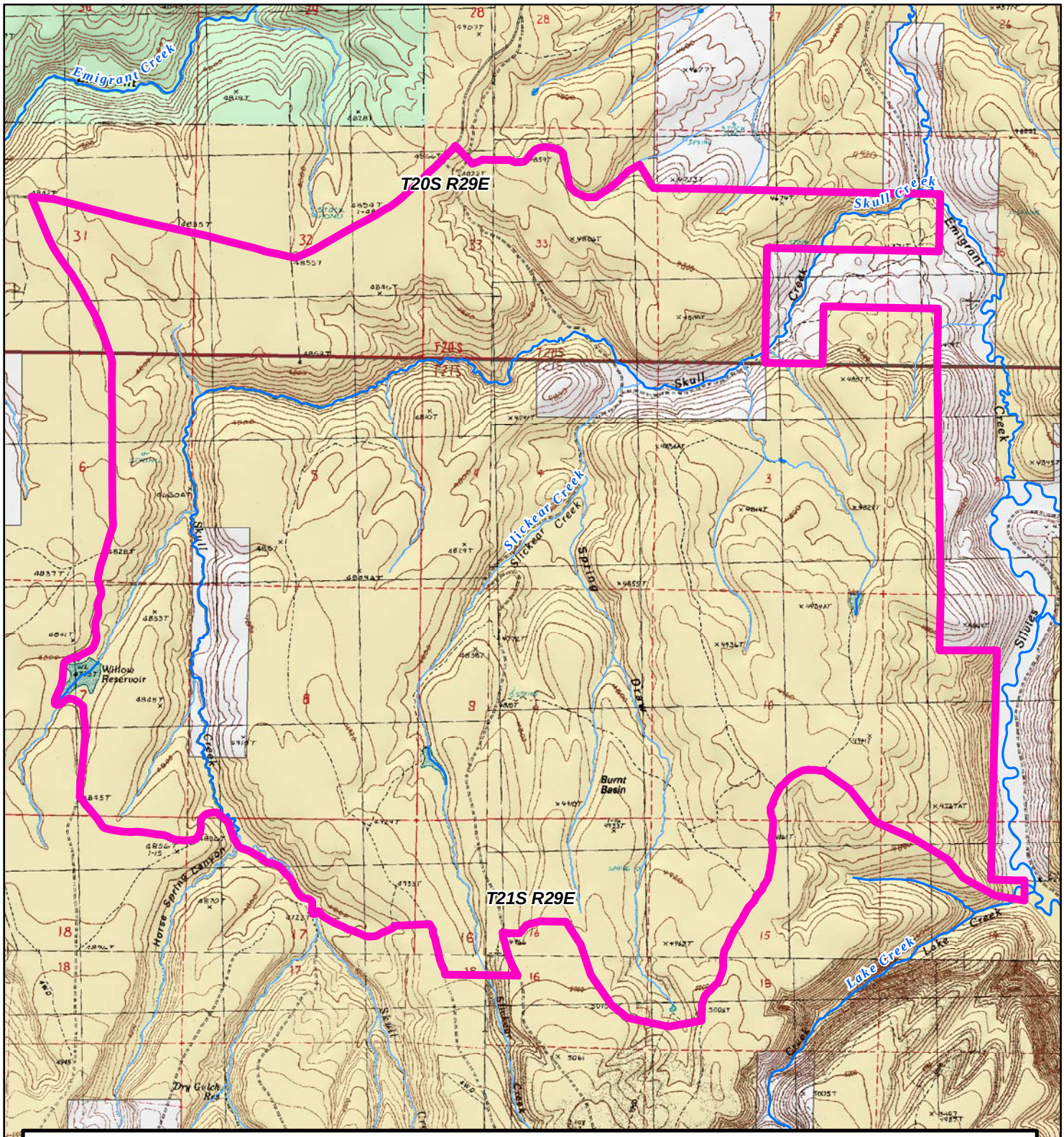

Map 2: Slickear Creek Unit Topo Map

Project Area Boundary

BLM Land

U.S. Forest Service Land

Private Land

0 0.25 0.5 1 Miles

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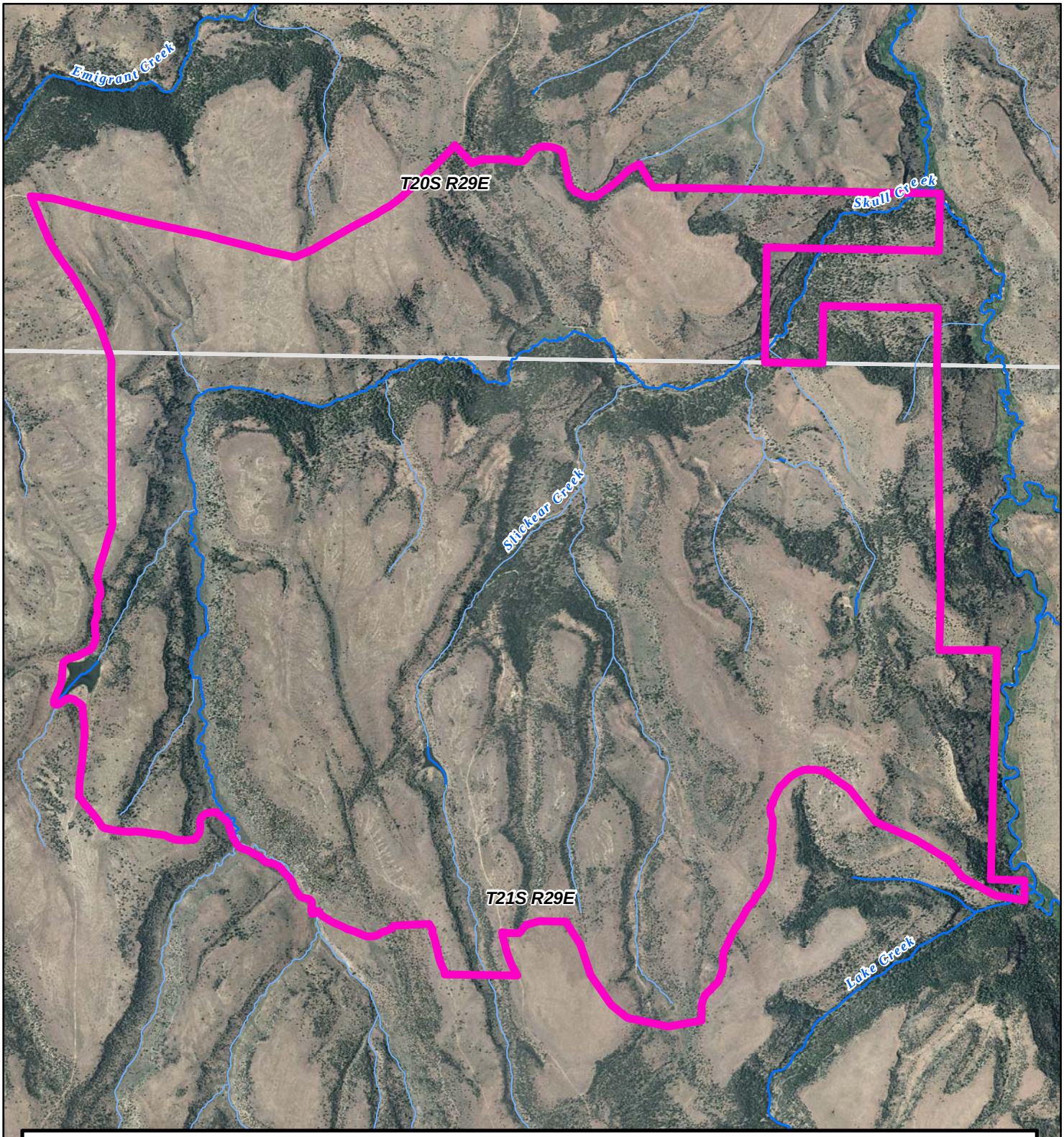

Map 3: Slickear Creek Unit Aerial Photo Map

Project Area Boundary

2005 Summer Aerial Image (NAIP)

0 0.25 0.5 1 Miles

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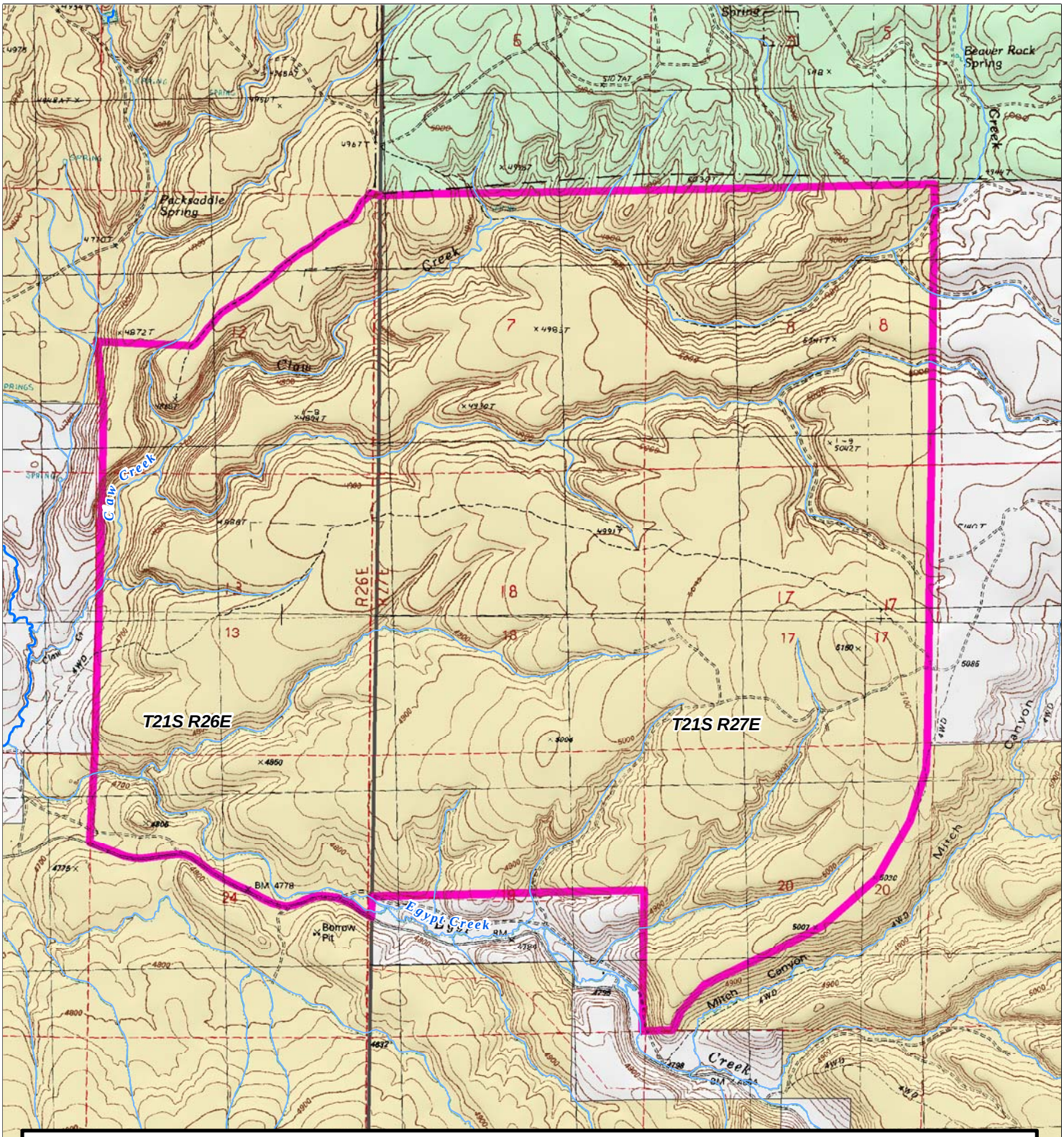

Map 4: Claw Creek Unit Topo Map

- Project Area Boundary
- BLM Land
- State Land
- U.S. Forest Service Land
- Private Land

0 0.25 0.5 1 Miles

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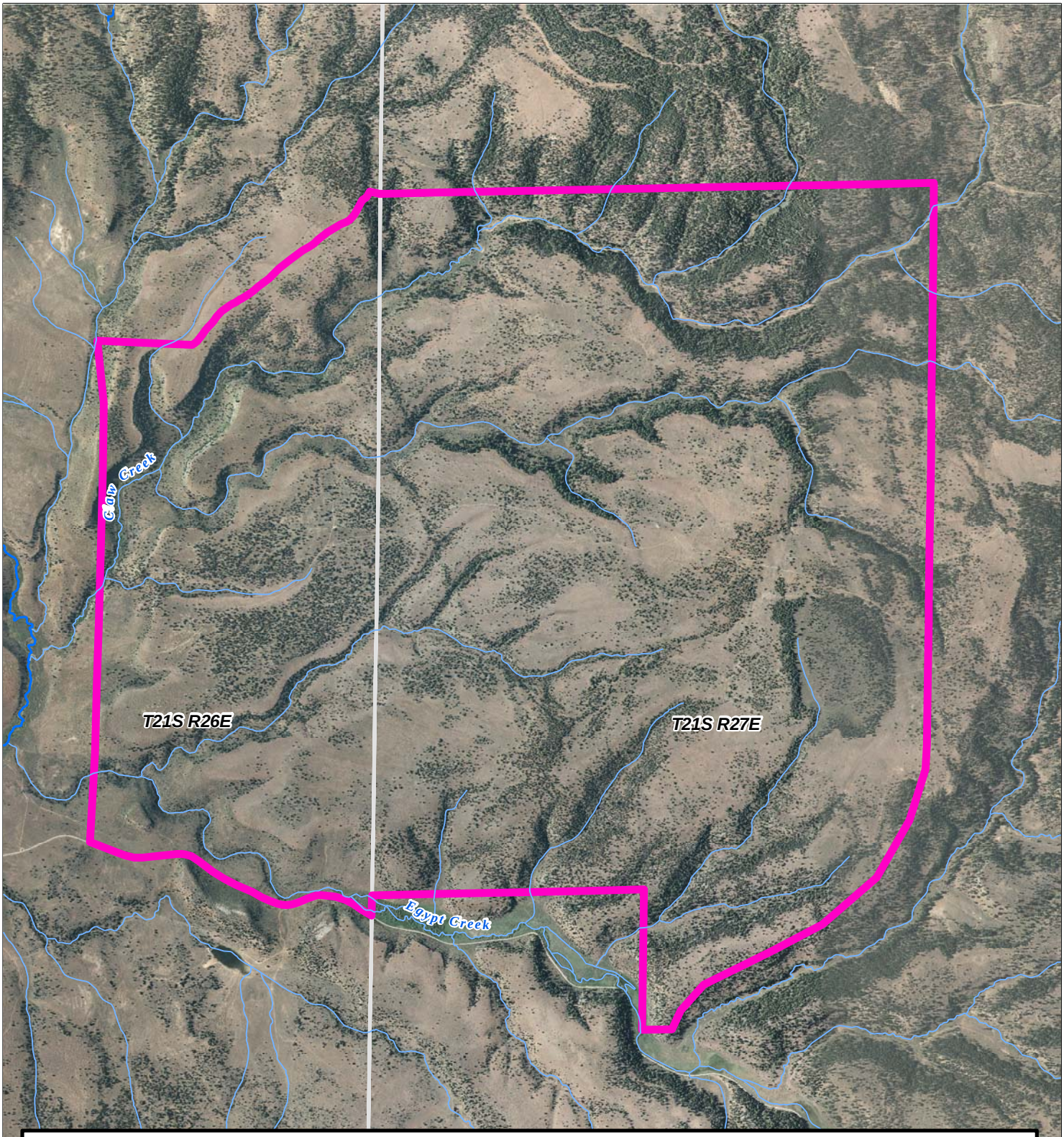

Map 5: Claw Creek Unit Aerial Photo Map

Project Area Boundary

2005 Summer Aerial Image (NAIP)

0 0.25 0.5 1 Miles

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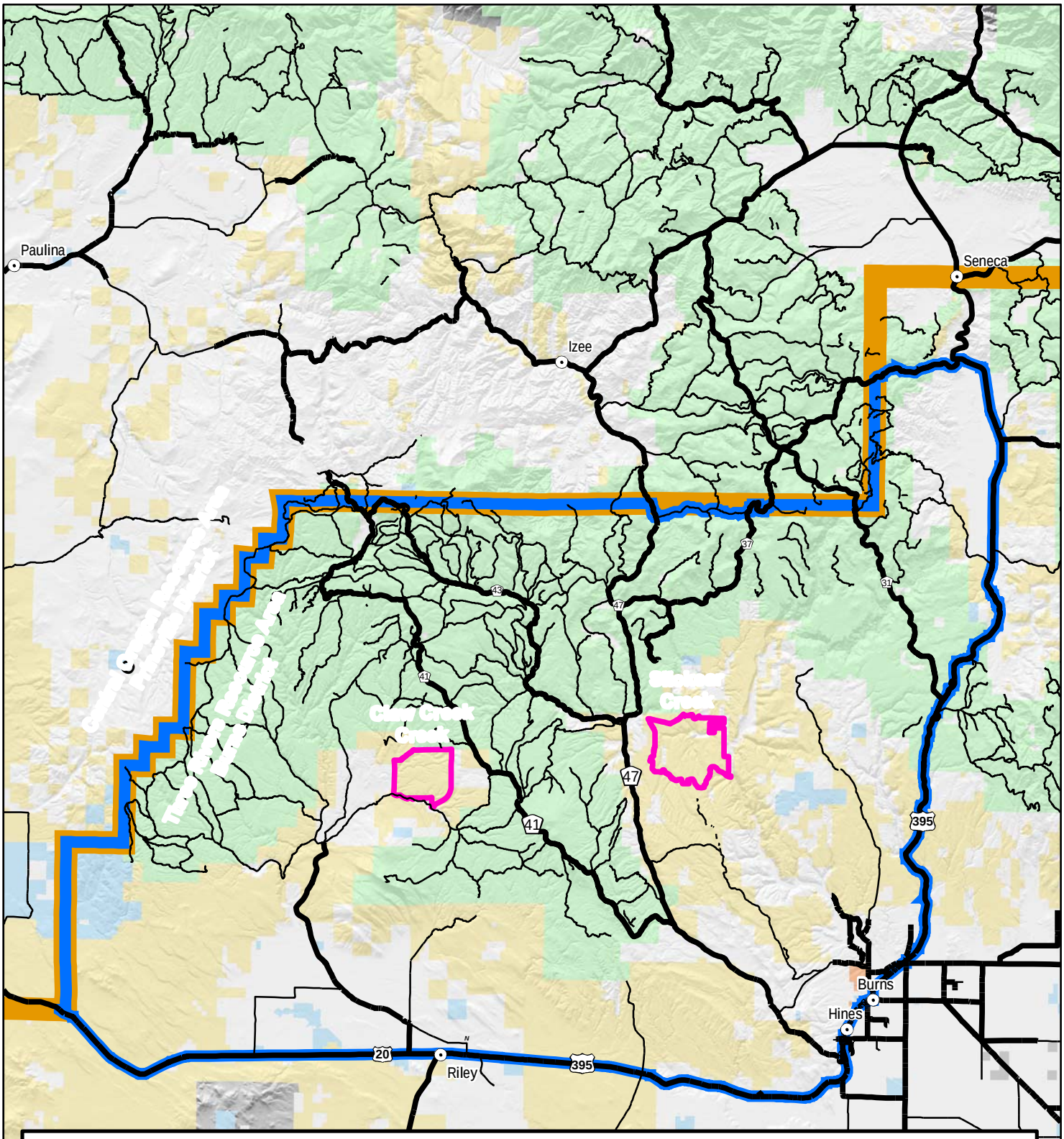

Map 6: Slickear / Claw Creek Cumulative Effects Analysis Area Map

- Paved Road
- Non-Paved Improved Road
- Cumulative Effects Analysis Area
- Project Area Boundaries
- Resource Area Boundary
- BLM Land
- State Land
- U.S. Forest Service Land
- Indian Reservation
- Private Land

0 2.5 5 10 Miles

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