# Hayden Hill Sage-Grouse Habitat Project
# Environmental Assessment

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# CHAPTER 1: INTRODUCTION

This Environmental Assessment (EA) is prepared to disclose and analyze the environmental consequences of authorizing the manual removal, piling and burning of Western juniper (*Juniperus occidentalis*) from 1,460 acres within the Hayden Hill area (Figure 1). The EA is a site-specific analysis of potential impacts that could result with the implementation of one of the alternatives. The EA assists the Bureau of Land Management (BLM) in project planning and ensuring compliance with the National Environmental Policy Act (NEPA) and in compliance with other laws and policies affecting the alternatives. If the decision maker determines that this project has "significant" impacts following the analysis in the EA, then an Environmental Impact Statement (EIS) would be prepared for the project. If not, a decision will be issued along with a Finding of No Significant Impact (FONSI) statement, documenting the reasons why implementation of the selected alternative would not result in "significant" environmental impacts.

## Purpose and Need for the Action

The primary purpose of the Proposed Action is to manually remove Western juniper within Greater sage-grouse (*Centrocercus urophasianus*) habitat, in order to restore sage steppe ecosystems and associated vegetation communities suitable for sage-grouse nesting, brood-rearing and wintering. Sage-grouse are heavily dependent on sagebrush habitats and are considered a sagebrush obligate species. Historical and active breeding grounds (leks) on BLM-administered lands are located primarily in low sagebrush habitats. Sage-grouse use sagebrush stands as both winter and nesting habitat. Sage-grouse most often nest under sagebrush shrubs; successful nesting habitat contains an understory of tall grass cover (Gregg et al. 1994).

The proposed project is needed due to the loss of sagebrush ecosystems across the landscape as the density of Western juniper has altered the project area from sage steppe to juniper dominated woodlands. This altered landscape has contributed to the drastic decline in sage-grouse populations throughout California.

Western juniper (*Juniperus occidentalis*) has been actively invading the shrub steppe community for the past 120 to 130 years (Miller et al 1999; Miller et al. 2005). Active fire suppression, the introduction of extensive livestock grazing in the late 1800's and early 1900's, along with a wetter than normal period in the latter half of the 20th century, has allowed juniper to encroach into areas where it was formally excluded by periodic fire (Miller et al. 1995). Invasive Western juniper communities are continuing to reduce and replace the shrub steppe communities and thus reducing habitat and suitable forage for wildlife and livestock production on public rangelands. Juniper can act as effective perches for raptor predators but also reduce the amount and quality of sagebrush and forbs that are critical to the diet of sage-grouse.

A total of nine sage-grouse lek sites are located between 1.4 and 2.6 miles northeast of the project area. Removal of encroaching junipers would immediately enhance sage-grouse lek sites and nesting, brood-rearing and wintering habitat. The proposed project would also improve watershed function and condition, restore biodiversity and productivity and manage fuels to conform to the National Fire Plan requirements (USDA 2008).

## Scoping

The BLM Alturas Field Office (AFO) conducted internal scoping with an interdisciplinary team of specialists and with the permitee.

## Tiering to Existing Land Use Plan/Environmental Impact Statement

The Hayden Hill Sage-Grouse Habitat Project EA references and is tiered to the Record of Decision for the Alturas Resource Management Plan/Final Environmental Impact Statement (ROD/FEIS), April 2008 and the Record of Decision for the Sage Steppe Ecosystem Restoration Strategy Final Environmental Impact Statement (FEIS), December 2008.

## Plan Conformance

This Proposed Action is subject to the following use plan: Alturas Resource Management Plan (RMP) and Record of Decision (ROD), approved on April 17, 2008. The Proposed Action has been determined to be in conformance with this plan as required by regulation 43 CFR 1610.5-3(a). Specifically, Executive Summary Section "Preferred Alternative Management Actions" on pages ES-4 through ES-14 call for the following actions:

- Implement juniper reduction to enhance sagebrush ecosystems; focus on providing diversity in shrub age class and composition and healthy understory vegetation.
- Control invasive juniper and noxious weeds to improve or reestablish native habitats.
- Restore critical habitats of state-listed and BLM sensitive species in degraded sagebrush associations.
- Incorporate guidelines from the Conservation Strategy for Sage-Grouse (Centrocercus urophasianus) and Sagebrush Ecosystems within the Buffalo-Skedaddle Population Management Unit (Sage-grouse Strategy) (Northern California Sage-grouse Working Group 2006) to restore sage-grouse habitat in Wyoming and mountain big sagebrush ecosystems and manage juniper encroachment.
- Manage to reduce or eliminate populations of non-native or invasive species that are impacting native species and/or habitats in a manner consistent with state and federal policies, procedures and regulations.
- Sage-grouse: Implement locally developed sage-grouse strategies. Utilize translocation to augment low populations in conjunction with habitat management projects.
- Prioritize restoration treatment methods for removal of invasive juniper in shrub steppe communities as follows:
  - Implement prescribed fire and wildland fire use on 75 to 10,000 acres
  - Implement manual treatments on 50 to 5,000 acres
  - Employ natural disturbance processes, particularly prescribed fire and wildland fire use as the preferred method of restoring shrub communities, along with thinning using mechanical and manual methods to stimulate seedlings and sprouting.

## Relationship to Statues, Regulations, and Plans

***Cultural Resources***

Agreement between State Director and State Historic Preservation Officer Protocol Amendment for Supplemental Procedures for Sage Steppe Ecosystem Restoration: In December 2008, the State Director, California Bureau of Land Management and the California State Historic Preservation Officer (SHPO) addressed the issue of a less than Class III survey for Sage Steppe Ecosystem Restoration projects. The supplemental procedures are an amendment to the Statewide Protocol Agreement (Protocol), October 15, 2007. These procedures deviate from the Protocol in *Section V.D.* and in *Section VI. Thresholds for SHPO Review*, which states *"Where BLM proposes to complete less than a BLM Class III survey of the affected (selected) Lands and when informal consultation with SHPO yields consensus agreement to proceed with formal consultation"* by allowing for less than a Class III survey. *A core feature of this amendment is the compilation, testing, and refinement of a site sensitivity model. However, projects may be implemented prior to completion of the compilation, testing, and refinement of a site sensitivity model provided that the other provisions of Stipulation II are met.*

***Wildlife***

Endangered Species Act: The Endangered Species Act of 1973 (ESA) requires federal agencies to complete formal consultation with the U.S. Fish and Wildlife Service (FWS) for any action that "may affect" federally listed species or critical habitat. The ESA also requires federal agencies to use their authorities to carry out programs for the conservation of endangered, threatened and candidate species.

Master MOU between BLM and the California Department of Fish and Game (applicable for State listed Species): Some BLM Lands may also provide habitat for State listed fish, wildlife, and plant species. In a Master MOU between BLM and the California Department of Fish and Game (CDFG), BLM agrees to notify the Department of all projects involving impacts to, or manipulation of, State-listed rare and endangered fish, wildlife, and plants and to obtain State recommendations for the project-specific management of such populations.

***Wilderness***

Wilderness areas are managed primarily to preserve natural conditions. The Wilderness Act prohibits commercial enterprises, permanent and temporary roads, the use of motor vehicles, motorized equipment, or mechanical transport, landing of aircraft, and placement of new structures and installations. Each of these prohibitions are subject to special provisions provided both in the Wilderness Act and the Act designating the area as wilderness. Section 603(c) of Federal Land Policy Management Act (FLPMA) directs the BLM on how to manage lands under wilderness review, in these words:

*"During the period of review of such areas and until Congress has determined otherwise, the Secretary shall continue to manage such lands according to his authority under this Act and other applicable law in a manner so as not to impair the suitability of such areas for preservation as wilderness".*

Section (H-8550.1) the "Interim Management Policy for Lands Under Wilderness Review" (IMP), provides BLM the guidance for implementing this portion of FLPMA.

Sage Steppe Ecosystem Restoration Strategy Record of Decision (ROD) and Final Environmental Impact Statement, *Modoc, Lassen, Shasta and Siskiyou counties, California and Washoe County, Nevada.* Record of Decision signed December 2008. The Sage Steppe Ecosystem Restoration Strategy focuses on the restoration of sage steppe ecosystems that have come to be dominated by juniper, as the density of Western juniper has increased over the landscape. The management strategy would broadly identify appropriate restoration methodologies by ecological conditions; provide guidelines for design and implementation of effective restoration treatments for restoration areas to be analyzed site specifically over a 50-year horizon.

The Healthy Forest Restoration Act (HFRA), signed into law on December 3, 2003 by United States President, George W. Bush. It is designed to improve the capacity of the Departments of Interior and Agriculture to implement the National Fire Plan, and conduct hazardous fuels reduction projects to protect communities, watersheds, and other at-risk lands from catastrophic wildfire. The project analyzed in this EA meets the criteria of an Authorized Hazardous Fuels Reduction Project.

Buffalo Skedaddle Sage Grouse Conservation Plan, The Northeast California Sage-Grouse Working Group is an organization comprised of local government and non-government agencies and private entities who developed a Conservation Strategy for Sage-Grouse and Sagebrush Ecosystems within the Buffalo-Skedaddle Population Management Unit. This document is a product related to sage-grouse conservation and sagebrush restoration, and states that among its top priorities are retention of leks in public ownership and acquisition of leks occurring on private lands. Pursuing this project demonstrates to partners and the public that BLM is continuing to move forward with actions to conserve sage-grouse, sage-grouse habitat and the health of watersheds within the Sierra Nevada region.

## BLM Standards and Guidelines for Livestock Grazing Management

The Record of Decision was signed in June 1999 for the EIS documenting the effects of adopting regional Standards for Rangeland Health and Guidelines for Livestock Grazing Management on BLM-administered lands in parts of California and northwest Nevada. The Record of Decision covers that part of California and Nevada formerly known as the Susanville District. Standards were established for Upland Soils, Streams, Water Quality, Riparian, Wetland Sites and Biodiversity. Guidelines for livestock grazing were developed to ensure that standards are met or that significant progress is made toward meeting the standards.

# CHAPTER 2: PROPOSED ACTION AND ALTERNATIVES

### Proposed Action

The BLM proposes to manually remove Western juniper from approximately 1,460 acres (Figure 1) of lands managed by the AFO. The project area is located approximately 20 miles south of Adin, California in Township 36 North, Range 9 East, Sections 15, 21, 22, and 23. The project

is located within the Silva Flat Allotment # 00218. In addition to manual removal of juniper, a division fence would be built within the allotment; creating two separate pastures. The creation of separate pastures would facilitate "resting" of the project area from cattle grazing for two growing seasons as required by the Sage Steppe Ecosystem Restoration FEIS and allow for the establishment of a rotational grazing system. The Silva Flat Allotment encompasses over 18,000 acres and only contains boundary fences. No individual pastures fences exist within the allotment. The proposed fence is 5.7 miles in length (Figure 1).

Manual removal of junipers would be accomplished by crews using chainsaws to cut down junipers. Disposal of junipers and their associated slash would be accomplished by piling and burning them on site or chipping. Ten percent of the cut junipers may be "lopped and scattered" outside of sage-grouse lek sites and potential nesting, brood-rearing and wintering habitat. Manual removal, burning and/or chipping of junipers may be conducted by BLM fire and/or fuels crews, local Conservation Crews or contracted to the public.

Due to a lack of roads within the project area, All Terrain Vehicles, pick-up trucks and rubber tire tractors would be utilized by the fence contractor and permitted to drive off-road in order to build the proposed fence during the construction phase of the project.

Project activities are anticipated to commence in October of 2010 and may take up to five years to complete.

Up to six percent of junipers may remain un-cut and standing. Additionally, no old-growth juniper would be removed from the project area and no new permanent or temporary roads or landings would be authorized under the proposed project.

The project area would be rested from cattle grazing for a minimum of two growing seasons following the completion of the project.

**Monitoring**

1. Cultural Resources
    a. Post treatment monitoring will comply with the Supplemental Procedures for Sage Steppe Ecosystem Restoration Amendment to the State Protocol Agreement and include:
        i. Testing the predictions of the sensitivity model against findings from Class III surveys
        ii. Assessing the success of applications of the Standard Resource Protection Measures
2. Vegetation
    a. Vegetation monitoring will comply with the Sage Steppe Ecosystem Restoration Strategy Vegetation Monitoring Protocols (2009) and include:
        i. Noxious Weed Monitoring
        ii. Old Growth Tree Retention Monitoring
        iii. Dense Juniper Retention Monitoring
    b. Vegetation Composition Monitoring

        i. Photos Points
        ii. Line Point Intercept Transects
3. Wildlife
    a. Sage-grouse: Surveys for sage-grouse will be conducted annually throughout the project area after project activities have been completed.
    b. Raptors: Surveys will be conducted throughout the project area during the breeding season (April 1-June 15) annually, within suitable habitat **prior** to the commencement of project activities.
    c. Pronghorn surveys will be conducted during the migration and kidding seasons in the following areas:
        i. Township 36 North, Range 9 East, Section 22, specifically NENE, SWNE, NWSE, NESE, SWSE and SESE aliquot parts.

**No Action Alternative**
Under the No Action Alternative, junipers would not be removed from the project area. No restoration or enhancement would occur in sage-grouse habitats; allowing junipers to continue to encroach into sagebrush habitats. This would allow for the continued degradation of sage-grouse habitat and the inevitable extirpation of sage-grouse from the project area. Watershed function and productivity would continue to degrade, while fuel loads accumulate and increase the potential for catastrophic wildfires. Additionally, a division pasture fence would not be constructed and a rotational grazing system would not be implemented.

**Alternatives Considered but Eliminated from Detailed Analysis**
Two alternatives considered were prescribed burning and mechanical treatment of the 1,460 acre project area to remove Western juniper. These alternatives were eliminated from detailed analysis because of the difficulty in keeping fire within the targeted vegetation types and the inability to prevent the burning or removal of existing native shrub and perennial grass understory with both types of treatments. The goal is to maintain a healthy shrub and grass component and remove enough juniper trees in order to allow the native shrub and grass component to reach a desired plant community. Cheatgrass invasion could also occur with prescribed burning and mechanical treatments (temporary road, skid trail and landing constructions) in the lower elevations of the project area.

# CHAPTER 3: ENVIRONMENTAL ANALYSIS

The interdisciplinary review has concluded that the following critical elements of the human environment and other potential concerns were considered but were determined not to be affected or impacted by the Proposed Action and will not be discussed further in this EA:

- Areas of Critical Environmental Concern
- Environmental Justice
- Farmlands, Prime or Unique
- Native American Concerns
- Paleontological Resources

- Unusual Plant Assemblages
- Waste, Hazardous and Solid
- Wild and Scenic Rivers
- Wilderness
- Wild Horse and Burros

## 1. AIR QUALITY

### A. Affected Environment

The project area is located in the Northeastern Plateau Air Basin (NPAB) which includes Siskiyou, Modoc and Lassen Counties. The Modoc County Air Pollution Control District has jurisdiction over air quality issues throughout the NPAB and administers air quality regulations developed at federal, state and local levels.

In the AFO area, particulate matter is the primary pollutant of concern. During summer months, when wildfires and prescribed burns are a significant source of airborne particulate matter, frequent dry periods can result in infrequent mixing and ventilation, which results in higher levels of particulate matter. In winter months, particulate matter from wood burning stoves and furnaces often result in increased levels of airborne particulate matter. During these months, air quality is less likely to meet federal and state requirements.

Particulate matter can damage human health and retard plant growth. Health concerns associated with suspended particulate matter focus on those particles small enough to reach the lungs when inhaled. Particulates also reduce visibility and corrode materials. Emissions of particulate matter are generated by a wide variety of sources including wildfires and prescribed fires, agricultural activities, industrial emissions, dust suspended by vehicle traffic and construction equipment (including chainsaws), and secondary aerosols formed by reactions in the atmosphere.

### B. Environmental Consequences

**Impacts of the Proposed Action**

Burning piled junipers would generate smoke that may cause a temporary localized conflict with residents, recreational users and other visitors. Motorized vehicles and equipment with an internal combustion engine would emit pollutants including ozone precursors, carbon monoxide and particulate matter. The use of unsurfaced roads and recreational off-highway vehicles would generate localized fugitive dust.

**Impacts of the No Action Alternative**

Under the No Action Alternative, no junipers would be cut, piled, burned or chipped. This would eliminate the use of vehicles, chainsaws and prescribed fire; resulting in no increase of smoke or pollutants within the project area.

### C. Cumulative Impacts

Smoke from prescribed fires burning simultaneously in the following adjacent areas would significantly lower air quality in northeastern California and northwest Nevada:

- BLM Alturas Field Office
- BLM Lakeview Field Office
- BLM Winnemucca Field Office
- Sheldon National Wildlife Refuge
- Hart Mountain National Antelope Refuge
- Modoc National Forest
- Private and state lands

Prevailing winds in the area blow from the south and southwest. As a result, multiple fires could degrade air quality in southern Oregon and northwest Nevada. However, several fires are not likely to burn simultaneously due to coordination of burn plans between BLM field offices, Forest Service, California Department of Fish and Game and California Department of Forestry and Fire Protection. Air quality would be significantly degraded if a prescribed burn were to escape causing multiple fires to burn at the same time. No significant cumulative effects are expected.

**D. Consultation**
N/A

**E. Mitigation**
N/A

**F. References**
USDI. Bureau of Land Management. 2008. Proposed Resource Management Plan and Final Environmental Impact Statement, Alturas Field Office. Alturas, CA.

**G. Maps**
N/A

## 2. CULTURAL RESOURCES

**A. Affected Environment**
The Hayden Hill Sage-Grouse Habitat Project is located south of the Hayden Hill mine, bordered on the east-northeast by Silva Flat and the Silva Flat Reservoir. Juniper Lake, a natural lake, is located in the northeastern portion of the project. Ethnographically, this area was part of the Pit River territory (Kniffen 1928). Historically, this area has been used for sheep and cattle grazing. Cultural resource inventories in the vicinity of the project area indicate that the area was used by prehistoric people for resource procurement. Historic resources are associated with livestock grazing, homesteading and recreation.

The Hayden Hill Sage-Grouse Habitat Project area is within the territorial boundaries of the *Aporige* band of the Pit River Tribe (Kniffen, 1928). Initial consultation with the Pit River Tribe was conducted on January 7, 2010. To date, the Pit River Tribe has voiced no concerns about the Hayden Hill Sage-Grouse Habitat Project.

A Cultural Resource Inventory, in accordance with the Supplemental Procedures for Sage Steppe Ecosystem Restoration amendment to the State Protocol Agreement, has been conducted for the Hayden Hill Sage-Grouse Habitat Project. The inventory resulted in the recordation or re-recordation of 34 prehistoric archaeological sites, three of which are beyond or adjacent to the project boundary, and 14 prehistoric isolated artifacts. A formal determination of National Register eligibility has not been made for any of the sites, thus the BLM assumes that the sites are eligible and afforded the same protection as those deemed eligible. The BLM does not protect isolated finds.

**B. Environmental Consequences**

**Impacts of the Proposed Action**
Under the Proposed Action the types of cultural resource sites found within the project area have the potential to be impacted by manual removal of juniper. It is felt that these impacts, felling and disposing of juniper trees and their associated slash, would be beneficial to the sites (i.e. attracting less public attention to sites and leaving fewer incentives for grazing impacts to cultural resources).

**Impacts of the No Action Alternative**
Under the No Action Alternative, junipers would not be removed from the project area. Under this alternative, indirect impacts to cultural resources would continue to occur in areas where cattle continue to trail across, trample, wallow, and congregate under the shade provided by juniper trees.

**C. Cumulative Impacts**
The Proposed Action would result in impacts to cultural resources. It is felt that these impacts would have a positive effect by eliminating impacts caused by cattle grazing to cultural resources located within the Hayden Hill Sage-Grouse Habitat Project.

**D. Consultation**
The Pit River Tribe was originally consulted with on January 7, 2010 and several times after. They have yet to express any concerns about the project.

**E. Mitigation**
N/A

**F. References**
Kniffen, F. B. 1928. *Achomawi Geography*. University of California Publications in American Archaeology and Ethnology 23(5):297-332.

**G. Maps**
N/A

## 3. FLOODPLAINS

### A. Affected Environment

Three unnamed ephemeral drainages exist within the project area. Two of the drainages meet in the northwest portion of the project area and flow approximately 1.3 miles across public lands to the south along the western edge of the project area. This drainage continues another 1.5 miles to the south and then southwest where it enters Little Coyote Reservoir. The third unnamed ephemeral drainage is located in the southeast portion of the project area. This drainage flows approximately 0.3 mile across the project area and continues another 0.3 mile where it enters Dobe Flat Reservoir. All three drainages transport water during spring runoff and temporarily following storm events, but do not support true floodplain development.

The Federal Emergency Management Agency (FEMA) has not designated any critical floodplains within the Hayden Hill Sage-grouse Habitat Project area. There are no known flooding problems that have occurred in the area. All three drainages that flow across public lands are well armored and hydrologically stable because of the amount of cobbles, rock and stones that occur in the ephemeral drainages.

### B. Environmental Consequences

**Impacts of the Proposed Action**

Due to the stability of the drainages and the juniper treatment being manual, it has been determined that there would be no affect to floodplains as a result of the proposed action. Therefore, neither of the alternatives would have any impact on floodplains.

**Impacts of the No Action Alternative**

Same as the proposed action.

### C. Cumulative Impacts

A juniper reduction project was conducted northwest of the proposed project area in 2007 (Parks I Project). This project included 315 acres of BLM lands and 640 acres of private lands. The Modoc National Forest anticipates implementing an additional juniper project consisting of 300 acres due north of the Parks I project in 2010. The permittee is also anticipating additional juniper treatments in 2010 and 2011.

Cumulative impacts would be positive for biodiversity and sage steppe ecosystem. Removing Western juniper in areas in which understory species have been extirpated can potentially restore understory productivity and diversity (Bates et al. 2000). The pasture division fence would also have a positive cumulative effect as improved livestock management within the allotment would be implemented. A healthy sage steppe ecosystem will decrease the amount of surface runoff reducing the amount sediment entering the ephemeral drainages; negative cumulative impacts are not foreseen or anticipated from this project.

### D. Consultation

None

**F. References**

1999 Federal Emergency Management Agency (FEMA). National Flood Insurance Program. Flood Insurance Rate Map Lassen County California.

Bates, J. D., R.F. Miller, and T.J Svejcar. 2000. Understory dynamics in cut and uncut Western juniper woodlands. Journal of Range Management. 53:119-126

**G. Maps**

Figure 1

## 4. INVASIVE, NON-NATIVE SPECIES

Weeds are defined in this EA as plants that are exotic or non-native. Non-native weeds have the ability to out-compete and replace native plants, often creating their own monotypic plant community. Uncontrolled noxious weed infestations result in decreases of native vegetation diversity, reductions in forage and wildlife habitat, and declines in agricultural crop values. Once exotic weeds become established it is extremely difficult to eradicate them and bring back the native communities that have been displaced.

**A. Affected Environment**

The Hayden Hill Sage-Grouse Habitat Project area falls within the Lassen County Noxious Weeds Project Area and is managed under the BLM Alturas Integrated Weed Management Program. The project area and the area to the southwest and west were surveyed in 2007, 2008 and 2009 by the BLM weeds crew. In 2009, the crew inventoried the roads from Highway 139 to the Silva Flat Reservoir and no weeds were found within the northern portion of the proposed project area. In the areas approximately ½ to 1 ½ miles southwest and west of the project area, the weeds crew recorded 20 points, three lines and one polygon of Scotch thistle using a Global Positioning System (GPS).

**B. Environmental Consequences**

**Impacts of the Proposed Action**

Under the Proposed Action, manual removal of juniper trees and the addition of the pasture division fence would be beneficial to ecosystem health and biodiversity. Cutting juniper trees has proven to be effective in increasing total understory biomass, cover and diversity (Bates et al. 2000) and the addition of the pasture division fence will allow a grazing system to be developed for improved livestock grazing management. The Proposed Action is not expected to increase the establishment or spread of noxious weeds within the project area. The project area will be inventoried prior, during and after the project is completed for the early detection and rapid response (EDRR) of noxious weeds within the project area. All noxious weeds found will be treated and evaluated.

New noxious weed species could be introduced to the project area as a result of crew transport vehicles coming from out of the area. However, conformance with the Alturas Field Office Noxious Weed Prevention Schedule and EDRR would reduce this risk. Also, if sufficient, desirable, perennial understory vegetation exists, then these desirable species should become

established and out-compete any potential noxious weeds or invasive species from becoming established.

**Impacts of the No Action Alternative**
Under the No Action alternative, invasive and noxious weeds may eventually increase into the project area, particularly along traveled roads. Declining understory species in sagebrush and juniper woodland sites would increase the risk of noxious weeds and invasive species establishment following a natural disturbance (e.g. wildfire) due to the lack of competition from desirable perennial grasses, forbs and shrubs. Increasing the density of woodlands would also increase the size and effect of a potential wildfire; which indirectly would provide large areas for noxious weeds and invasive species to establish following a wildfire event.

**C. Cumulative Impacts**
A juniper reduction project was conducted northwest of the proposed project area in 2007 (Parks I Project). This project included 315 acres of BLM lands and 640 acres of private lands. The Modoc National Forest anticipates implementing an additional juniper project consisting of 300 acres due north of the Parks I project in 2010. The permittee is also anticipating additional juniper treatments in 2010 and 2011.

Cumulative impacts would be positive for biodiversity and sage steppe ecosystem. Removing Western juniper in areas in which understory species have been extirpated can potentially restore understory productivity and diversity (Bates et al. 2000). The pasture division fence would also have a positive cumulative effect as improved livestock management within the allotment would be implemented. A healthy sage steppe ecosystem will decrease the risk of noxious weed establishment; negative cumulative impacts are not foreseen or anticipated from this project.

**D. Consultation**
N/A

**E. Mitigation**
Conformance with the AFO Noxious Weed Prevention Schedule.

**F. References**
USDI. Bureau of Land Management. Alturas Field Office Noxious Weeds Geographic Information System (GIS) database.

Bates, J. D., R.F. Miller, and T.J Svejcar. 2000. Understory dynamics in cut and uncut Western juniper woodlands. Journal of Range Management. 53:119-126

**G. Maps**
See Figure 4

## 5. NATIVE AMERICAN CONCERNS
At this time there are no known Native American concerns.

## 6. RANGE MANAGEMENT

### A. Affected Environment

The Hayden Hill Sage-Grouse Habitat Project area falls within the Silva Flat Allotment #00218. The allotment has a total of 18,100 acres that includes 14,750 acres of public land, 1,272 acres of private and 624 acres of other federal land. The grazing permit authorizes the permittee for 293 cattle from May 1 to September 30 at an authorized use of 1,247 active animal unit months (AUMs) and 922 suspended AUMs. Actual dates are dependent upon water availability and utilization levels. Since 2007, the permittee has turned cattle out between June 2 and June 20 annually. A 4-6 inch minimum stubble height is required at the end of the growing season in most riparian areas (primarily the Sheep Valley area) and a 30-40% utilization level in the uplands (1999 Northeastern California and Northwestern Nevada Standards and Guidelines for Livestock Grazing).

A Rangeland Health Assessment was conducted in the summer and fall of 2002. The uplands met most standards. A silver sagebrush meadow in Township 36 North, Range 9 East, Section 35 was tending towards not met. The riparian area of Sheep Valley did not meet standards. Sheep Valley was classified as Category 1, not meeting Rangeland Health Standards with livestock being the contributing factor. The resource concerns were on the Ravendale Silty Clay soils.

According to the 2002 Rangeland Health Assessment, Western juniper was found to be invading the deep loams and rocky areas (Stony Loam and Cool Deep Loam Ecological Sites). Western juniper is also invading the edges of silver sagebrush flats.

A number of factors can be attributed to plant ecological trajectories resulting in late successional sagebrush and juniper communities in the Great Basin. These include recovery from past disturbance, historic and prehistoric fires, widespread harvesting by early settlers, natural range expansion, direct and indirect effects of livestock grazing, fire exclusion (suppression), and climatic variability and rising $CO_2$ (Romme W.H. et al. 2009)

### B. Environmental Consequences

**Impacts of the Proposed Action**

The Proposed Action affects approximately eight percent of the Silva Flat Allotment. Impacts of juniper treatments and reducing juniper dominance on the sage steppe ecosystem will increase ground cover and biodiversity, decrease erosion and loss of top soil, and change the surface and subsurface water flow dynamics. This proposed project will help restore vegetative composition and structure to the sage steppe ecosystem.

In the short-term, manual (hand cutting) juniper treatments would affect the permittees livestock operation by having to rest the proposed south pasture of the Silva Flat Allotment for a minimum of two growing seasons after the completion of the project. Rest from livestock grazing following treatment will improve the chances for success by allowing the restorative processes to

take place. There are three principle reasons that rest from livestock grazing would be necessary: reestablishment of sage steppe vegetation, creating adequate understory for burning and preventing establishment of non-native species (Miller et al. 2005; Miller et al. 2007; USDA 2008). The two year rest from grazing would be accomplished by the construction of the proposed fence.

In the long-term, the proposed treatments would have a beneficial effect on livestock grazing as the treatment areas previously occupied by Western juniper which contain very little herbaceous understory are gradually restored to a healthy vigorous sagebrush/perennial grass plant community.

**Impacts of the No Action Alternative**

The No Action Alternative would continue to affect overall livestock performance and the economic stability of the permittee due to a reduction in the quantity and quality of grasses and other herbaceous forage which are important to cattle grazing the allotment. As the sagebrush/juniper woodlands transition from Phase I to II to III (see Vegetation Section) native herbaceous and shrub species will tend to decline from these communities, thus reducing available forage for livestock. With a continued decline in the production and vigor of sage steppe plant communities, the forage base would not adequately support the existing authorized use and would adversely affect livestock performance (e.g. decreased cattle weights, decreased calving crops, decreased weaning weights, etc.).

**C. Cumulative Impacts**

The removal of juniper trees would allow more water into springs, seeps and ephemeral streams. The prolonged effect is more water would be available longer into the summer for livestock. Resting the proposed south pasture for two growing seasons would have a short-term adverse effect on the economic income of the permitee, but potentially provide more forage in the future.

**D. Consultation**

Buck Parks, Permittee

**E. Mitigation**

The Sage Steppe Ecosystem Restoration Strategy states: “During site specific project planning non-old growth juniper distribution will be designed so that following sage steppe restoration treatments, livestock are not attracted to riparian, aspen or old growth juniper stands to meet their shade requirements”. It is advisable that shade trees be left for livestock that are ¼ to ½ mile away from water sources and old-growth juniper. Trees would be limbed from two to six feet above the ground allowing livestock access under the trees. See Figure 5 for an example of a livestock shade tree.

**F. References**

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**G. Maps**
See Figures 1 and 2

## 7. RECREATION

**A. Affected Environment**
Recreation activities in the area include; driving for pleasure with four-wheel drive vehicles, viewing historical mining operations, pronghorn antelope hunting and watchable wildlife opportunities. In the past, a major recreational activity was viewing remnants and remains of historical mining operations, but this activity has been reduced in recent times due to the Hayden Hill Gold Operation. The project area has two public access points from State Route 139; through land administered by the Modoc National Forest and then on to BLM lands.

California Department of Fish and Game (CDFG) has administrative jurisdiction over a refuge on BLM land which encompasses the project area and provides watchable wildlife opportunities with emphasis on birds of prey, sage-grouse, mule deer, pronghorn antelope and waterfowl. The original intent of the refuge was protection of the mule deer herd, but allowed pronghorn antelope hunting. In recent years CDFG has issued a Public Lands Management permit (PLM) to an individual with private lands within the refuge boundary. This PLM permit is valid for waterfowl hunting only, on private lands near Silva Flat Reservoir.

**B. Environmental Consequences**

**Impacts of the Proposed Action**
With the removal of juniper, recreational opportunities would be enhanced due to the increase of riparian and upland vegetation which provides forage and cover for wildlife species. Impacts to recreation resources as a result of the project would enhance aesthetics and recreational activities. Plants utilized by a variety of wildlife in the project area have changed over the years, and negatively impacted the numbers and habitats of various terrestrial species. Big game species have declined due to poor habitat conditions, which is partially due to the encroachment of juniper and has moderate adverse effects on tourism.

Vegetation is critical for many aspects of recreation management. Too much vegetation or juniper on the landscape can be as detrimental to wildlife as too little vegetation. Due to the

displacement of key browse species for mule deer and pronghorn antelope, the heavy juniper component can reduce wildlife use, which translates into reduced recreation opportunities. Recreational opportunities and pronghorn hunting are enhanced with mosaics of varied vegetation types, rather than in an all juniper landscape. Additional and higher quality livestock forage would be available in the uplands where juniper has been cut, allowing livestock to disperse more evenly throughout the area. Thus, livestock impacts should be less, creating more diversity in the vegetation and enhancing recreation resources.

The proposed allotment division fence would divide the allotment into two pastures and allow for a deferred or deferred/rest grazing system; allowing mountain shrubs, riparian vegetation and grasses additional growth when rested. This would provide minor benefits, as a small number of additional large and upland game animals would be available for watchable wildlife opportunities and pronghorn antelope hunting. The pasture division fence would provide minor adverse impacts from livestock grazing on the use side of the fence and minor beneficial effects on the deferred/rest pasture.

There is one unpaved road associated with the project area. The road runs north/south and is located on the western boundary of the project area. Due to the limited road access, no impacts would be associated with Off Highway Vehicle activities.

**Impacts of the No Action Alternative**

Impacts to recreation resources with the continued loss of vegetation and wildlife relates to concerns in visual quality and aesthetics. A slight continuing downward trend would continue and negatively impact the numbers and habitats of various terrestrial species. Big game and upland game have declined due to poor habitat conditions and has moderate adverse effects on tourism. Loss of riparian and upland vegetation would continue to affect pronghorn antelope hunting and watchable wildlife opportunities, as these key vegetation types provide forage and cover. A gradual decline of recreational opportunities would continue under present management.

**C. Cumulative Impacts**

Several juniper removal projects have been completed in the immediate area and have benefitted wildlife, recreation, livestock and soils. On BLM lands, over 1,000 acres of Western juniper have been treated mechanically and manually in close proximity to the proposed project. Private land owners treated an additional 640 acres on private land since September of 2007 and have plans to treat additional acres. Overtime, as more juniper is removed from the landscape, wildlife use would increase, which would provide more recreational opportunities and activities. Cumulative effects from juniper removal on 1,460 additional acres would have minor to moderate beneficial effects by reversing the trend of juniper encroachment on the treated acres and enhancing recreation activities in the area.

Cumulative effects from the pasture division fence would provide minor adverse impacts from livestock grazing on the use side of the fence and minor beneficial effects on the rest pasture. Due to the adverse and beneficial aspects of the deferred or deferred/rest grazing use, recreational activities would probably remain about the same from construction of the fence.

**D. Consultation**
N/A

**E. Mitigation**
1. Recreational hunter camps will be avoided and have 30 foot uncut visual buffer zones with irregular edges.
2. Where old growth is sparse, scattered small groves of junipers will be left for Visual Resource Management (VRM) and wildlife values (as per Information Bulletin No. CA-2009-005).
3. At the base of rims where no other trees are present except juniper, leave juniper and brush uncut with the boundary of the cut lines left with a ragged and irregular look, with a minimum of 25 feet of uncut juniper from the rim to a maximum of 100 feet down slope. Thirty percent of the vegetation under the rims must be retained for VRM and wildlife values.
4. Leave single or multiple trees intact that are within rock piles to provide for visual diversity.

**F. References**
USDI. Bureau of Land Management. 2008. Proposed Resource Management Plan and Final Environmental Impact Statement, Alturas Field Office. Alturas, CA.

**G. Maps**
N/A

## 8. SOCIAL AND ECONOMIC VALUES

**A. Affected Environment**
The extent to which BLM lands are managed by the AFO benefit or otherwise affect communities varies substantially depending on the following factors: 1) how close the communities are to BLM managed lands, 2) the amount of BLM land in the vicinity and 3) whether local commercial operations (including ranches) operate in association with BLM resources.

**B. Environmental Consequences**

**Impacts of the Proposed Action**
The Proposed Action may benefit the local economy as a result of employment and expenditures on equipment and supplies. Although beneficial, the total acreage proposed under the Proposed Action is not expected to result in a substantial change in the local economy.

**Impacts of No the Action Alternative**
Under the No Action Alternative, no benefits to the local economy would occur.

**C. Cumulative Impacts**
The Proposed Action may cause a beneficial effect to the local economy through employment and expenditures on local equipment and supplies.

**D. Consultation**
N/A

**E. Mitigation**
N/A

**F. References**
USDI. Bureau of Land Management. 2008. Proposed Resource Management Plan and Final Environmental Impact Statement, Alturas Field Office. Alturas, CA.

**G. Maps**
N/A

## 9. SOILS

**A. Affected Environment**
The soil classification for the Hayden Hill Sage-Grouse Habitat Project area is contained in the Soil Survey of the Intermountain Area, Parts of Lassen, Modoc, Shasta and Siskiyou Counties, 2003 (CA #604). The soil survey was updated May 20, 2008 by the Natural Resources Conservation Service (NRCS) California State Office to meet current standards. The AFO has a copy for review and it is available on the NRCS web site (Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture (Web Soil Survey). Available online at: http://websoilsurvey.nrcs.usda.gov/app/. A custom Soil Survey Report was created for this proposed project and a hard copy is available at the Alturas Field Office.

There are five soil mapping units (SMU) in the proposed project area. The dominant soil is SMU 199, Jellycamp-Karcal-Longcreek complex comprising 57% of the project area. Both soil complexes, Jellycamp-Vansickle (SMU 205) and Karcal-Cuppy (SMU 210) encompass 17% and 18% of the project area, respectively. Longcreek-Vansickle-Rock outcrop complex (SMU 235) and Bunselmeier very gravelly sandy loam comprise about 1% each of the project area. Descriptions of the soils are as follows:

| **Soil Mapping Units for Hayden Hill Sage-grouse Habitat Project** | | | |
|---|---|---|---|
| **Map Unit Symbol** | **Map Unit Name** | **Acres in Project Area** | **Percent of Project Area** |
| 120 | Bunselmeier very gravelly sandy loam, 15 to 30 percent slopes | 10 | <1% |
| 199 | Jellycamp-Karcal-Longcreek complex, cool, 2 to 15 percent slopes | 821 | 57% |
| 205 | Jellycamp-Vansickle complex, extremely stony loam, 2 to 9 percent slopes | 250 | 17% |
| 210 | Karcal-Cuppy complex, 2 to 15 percent slopes | 259 | 18% |

| | | | |
|---|---|---|---|
| 235 | Longcreek-Vansickle-Rock outcrop complex, to 30 percent slopes | 14 | 1% |
| 397 | Water | 86 | 6% |
| **Totals for Project Area** | | **1,440** | **100.0%** |

See Figure 6

Soil descriptions for the three dominant soils within the project area are listed below:

**SMU # 199 – Jellycamp-Karcal-Longcreek complex, cool, 2 to 15 percent slopes**
**Elevation**: 3,400 to 6,400 feet
**Mean annual precipitation**: 10 to 18 inches

Jellycamp soils, 35% of the SMU
**Landform**: Lava plateaus
**Parent material**: Alluvium derived from igneous rock
**Slope**: 2 to 9%
35% of the surface area covered with cobbles, stones or boulders
**Depth to restrictive feature**: 10 to 20 inches to duripan; 12 to 60 inches to lithic bedrock
**Drainage class**: Moderately well drained
**Ecological site**: Shallow cobbly clay 14-16 (R021XE121CA)
**Typical vegetation**: Idaho fescue, low sagebrush, bluebunch wheatgrass, Thurber's needlegrass
**Typical profile**:
0 to 7 inches: Very cobbly loam
7 to 19 inches: Clay
19 to 30 inches: Indurated
30 to 40 inches: Bedrock

Karcal soils, 30% of the SMU
**Landform**: Lava plateaus
**Parent material**: Alluvium derived from basalt
**Slope**: 2 to 9%
8% of the surface area covered with cobbles, stones or boulders
**Depth to restrictive feature**: 20 to 30 inches to lithic bedrock
**Drainage class**: Well drained
**Ecological site**: Shallow cobbly clay 14-16 (R021XE121CA)
**Typical vegetation**: bluebunch wheatgrass, bottlebrush squirreltail, low sagebrush, needlegrass, antelope bitterbrush, arrowleaf balsamroot, one-spike danthonia, giant wildrye, hawksbeard, Nevada bluegrass, rubber rabbitbrush, streambank wheatgrass, Utah serviceberry, wooly wyethia
**Typical profile**:
0 to 15 inches: Cobbly silty clay
15 to 29 inches: Silty clay
29 to 39 inches: Bedrock

Longcreek soils, 20% of the SMU
**Landform**: Lava plateaus

**Parent material**: Slope alluvium derived from igneous rock
**Slope**: 5 to 15%
40% of the surface area covered with cobbles, stones or boulders
**Depth to restrictive feature**: 14 to 20 inches to lithic bedrock
**Drainage class**: Well drained
**Ecological site**: Stony loam 14-18 ((R021XE130CA)
**Typical vegetation**: Bluebunch wheatgrass, mountain big sagebrush, Thurber's needlegrass antelope bitterbrush, basin wildrye
**Typical profile**:
0 to 3 inches: Very stony loam
3 to 16 inches: Very cobbly clay loam
16 to 26 inches: Bedrock

**SMU #205—Jellycamp-Vansickle complex, extremely stony loam, 2to 9 percent slopes**
**Elevation**: 3,400 to 5,800 feet
**Mean annual precipitation**: 12 to 18 inches

Jellycamp soils, 60% of the SMU
**Landform**: Lava plateaus
**Parent material**: Alluvium derived from igneous rock
**Slope**: 2 to 9%
65% of the surface area covered with cobbles, stones or boulders
**Depth to restrictive feature**: 10 to 20 inches to duripan; 12 to 60 inches to lithic bedrock
**Drainage class**: Moderately well drained
**Ecological site**: Shallow cool very stony loam 16-18 (R021XE124CA)
**Typical vegetation**: Idaho fescue, low sagebrush, bluebunch wheatgrass, Thurber's needlegrass
**Typical profile**:
0 to 5 inches: Extremely stony loam
5 to 12 inches: Clay
12 to 27 inches: Indurated
27 to 37 inches: Bedrock

Vansickle soils, 30% of the SMU
**Parent material**: Alluvium derived from igneous rock
**Slope**: 2 to 9%
65% of the surface area covered with cobbles, stones or boulders
**Depth to restrictive feature**: 10 to 20 inches to duripan; 11 to 30 inches to lithic bedrock
**Drainage class**: Moderately well drained
**Ecological site**: Shallow cool very stony loam 16-18 (R021XE124CA)
**Typical vegetation**: Idaho fescue, low sagebrush, bluebunch wheatgrass, Thurber's needlegrass
**Typical profile**:
0 to 6 inches: Extremely stony loam
6 to 20 inches: Very cobbly clay
20 to 24 inches: Cemented
24 to 34 inches: Bedrock

**SMU # 210—Karcal-Cuppy complex, 2 to 15 percent slopes**
**Elevation**: 4,300 to 5,800 feet
**Mean annual precipitation**: 10 to 16 inches

Karcal soils 75% of the SMU
**Landform**: Lava plateaus
**Parent material**: Alluvium derived from basalt
**Slope**: 2 to 15%
7% of the surface area covered with cobbles, stones or boulders
**Depth to restrictive feature**: 20 to 30 inches to lithic bedrock
**Drainage class**: Well drained
**Ecological site**: Shallow Cobbly Clay (R021XE121CA)
**Typical vegetation**: low sagebrush, bluebunch wheatgrass, Nevada bluegrass, arrowleaf balsamroot, needlegrass
**Typical profile:**
0 to 15 inches: Cobbly silty clay
15 to 29 inches: Silty clay
29 to 39 inches: Bedrock

Cuppy soils 20% of the SMU
**Landform**: Lava plateaus
**Parent material**: Alluvium derived from basalt
**Slope**: 2 to 15%
7% of the surface area covered with cobbles, stones or boulders
**Depth to restrictive feature**: 20 to 38 inches to duripan, 21 to 40 inches to lithic bedrock
**Drainage class**: Well drained
**Ecological site**: Cobbly Clay (R021XE108CA)
**Typical vegetation**: Columbia needlegrass, bluebunch wheatgrass, bottlebrush squirreltail, mountain big sagebrush, mountain brome, rubber rabbitbrush
**Typical profile:**
0 to 2 inches: Cobbly clay
2 to 18 inches: Clay
18 to 29 inches: Clay
29 to 31 inches: Indurated
31 to 41 inches: Bedrock

All the soils are well drained except for SMU 205 which is moderately well drained. The off-road/off-trail erosion hazard for SMUs 199, 205, and 210 is slight. The erosion hazard of roads (the hazard of soil loss from unsurfaced roads) for the three dominant soils is moderate. The soil survey gives the potential for damage to nutrient, physical and biotic soil characteristics by fire (prescribed and wildfire). The potential for damage by fire to SMU's 199 and 205 is high and the potential for damage to SMU 210 is moderate.

The soil survey defines the total range production as the amount of vegetation that can be expected to grow annually in a well managed area that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It

includes the current year's growth of leaves, twigs and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation. In a normal year, growing conditions are about average (Soil Survey 2010). The range production in a normal crop year is 520 pounds per acre per year (#/Ac/Yr) for SMU 199, 480 #/Ac/Yr for SMU 205 and 425 #/Ac/Yr for SMU 210.
As discussed in the Vegetation Section, approximately 21% of the project area has over 20% juniper canopy cover. An additional 47% of the project area has between 6 and 20% juniper canopy cover. This equates to lower percentages of shrub and herbaceous cover than is expected for the ecological sites found in the project area. Changes in infiltration and surface runoff patterns are the result of changes in the pattern and density of vegetation cover which alters soil properties and retention of overland flow (Wood 1988). Decreases in shrub and herbaceous vegetation cover has been attributed with increased Western juniper dominance (Miller et al. 2005) and as juniper dominance increases, ground cover decreases and bare ground increases (USDA Forest Service 2008; Coultrap 2008). Furthermore, as reported by Bates (2000), erosion rates were found to be higher in the interspaces of semiarid ecosystems and erosion potential was higher in juniper woodlands than in sagebrush grasslands. The correlation of juniper dominance and decreased shrub and herbaceous cover is more prevalent in drier sites having soils with a restrictive layer. These communities are primarily associated with the Jellycamp-Karcal-Longcreek complex (SMU 199) and the Jellycamp-Vansickle complex (SMU 205) but also to some extent with the Karcal soils of the Karcal-Cuppy complex (SMU 210).

Little information exists on biological crusts. The AFO has no data to support whether or not the project area (or most of the field office area) had a significant biological crust component. The BLM staff has located mosses on the allotment. Invasive exotic plants generally decrease structural diversity of native vascular plant communities and often fill previously biologically crusted interspaces. This has resulted in less cover and lower species richness of soil crusts (Rosentreter 1994; Kaltenecker 1997) where annuals dominate.

The size and identification of soil crusts is very difficult for landscape scale assessment. While the BLM recognizes the importance of biological soil crust, we have focused our efforts on the stabilization of native perennial plant communities on a larger scale. As the native plant communities improve and stabilize there is opportunity for reestablishment and or maintenance of existing biological soil crust organisms.

## B. Environmental Consequences

### Impacts of the Proposed Action

Soils in the Northern Great Basin and Modoc Plateau are becoming increasingly vulnerable to surface erosion as understory vegetation beneath the canopies of Western juniper stands is replaced by bare ground (Bates et al. 1998; USDA 2008a). Unvegetated soil surfaces are especially at risk of erosion during high intensity convective storms and during periods when the soil is frozen.

Hand cutting, pile burning and chipping of juniper would have a minimal impact on soils. Soil disturbances are anticipated to be offset by a positive increase in vegetation cover, which would thereby decrease the potential for soil erosion. By removing the overstory canopy (juniper),

there would potentially be a decrease in evapotranspiration and an increase in water availability (Thurow and Hester 2003) which benefits understory plant species and increases suitable habitat and forage.

Prescribed fire (pile burning) may directly affect soil by consuming organic matter, altering nutrients, creating water-repellent conditions, decreasing infiltration rates, and removing soil surface cover (Hungerford et al. 1990; Debano 1990; Childs et al. 1989). Although prescribed fire effects are generally short-term, where soils are shallow and have low natural fertility or are susceptible to erosion, prescribed fire can have a negative effect on productivity.

**Impacts of the No Action Alternative**

If no juniper treatments were to occur, an increase in erosion potential and a decrease in plant available water associated with juniper dominance and encroachment would continue. Juniper canopy closure would continue and on sites that have greater than 20% juniper canopy cover a threshold would be crossed causing further site deterioration within sagebrush/perennial grassland plant associations.

Western juniper canopies affect the amount of effective precipitation available for plant growth. Effective precipitation is the amount of precipitation that enters the soil and is stored in the soil profile at a given point within a watershed. Studies suggest that the amount of precipitation reaching the soil surface can be significantly reduced by the juniper canopy (Miller et al. 2005). The potential for interception from juniper foliage is greater in juniper woodlands than in a shrub steppe community (Eddleman et al. 1994). This condition would be prevalent on sites at or above 20% canopy cover, which encompasses 21% of the project area (see Vegetation Section). Areas with a juniper density of 6 to 20% cover could continue to increase and cross a threshold into the 21% cover range.

Studies comparing vegetation cover and erosion (Pierson 2007) showed that total vegetation cover (canopy and basal) and litter and infiltration was higher on uncut juniper woodlands than on cut treatments. Conversely, runoff and sediment yield was higher on uncut woodlands than on cut treatments.

With no treatment the area could be subject to a wind driven wildfire during the hot summer months of July and August. The effects of wildfire are often more severe and long lasting than effects associated with prescribed burning.

**C. Cumulative Impacts**

A juniper reduction project was conducted northwest of the proposed project area in 2007 (Parks I Project). This project included 315 acres of BLM lands and 640 acres of private lands. The Modoc National Forest anticipates implementing an additional juniper project consisting of 300 acres due north of the Parks I project in 2010. The permittee is also anticipating additional juniper treatments in 2010 and 2011.

Cumulative impacts would be positive for ecosystem diversity and rangeland health. Removing Western juniper in areas in which understory species have been extirpated can potentially restore understory productivity and diversity (Bates et al. 2000). This would reduce the erosion

potential because of the highly competitive nature of juniper with interspaced grasses. An increase in juniper cover often leads to increased exposure of bare soils. Any time bare soils are exposed, the potential for erosion is increased (Thurow and Hester 1997). Negative cumulative impacts are not foreseen or anticipated.

**D. Consultation**
N/A

**E. Mitigation**
N/A

**F. References**
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**G. Maps**
See Figure 6

## 10. VEGETATION

**Threatened or Endangered Species**
There are no Threatened or Endangered plant species in the project area. A BLM special status species, wooly stenotus (*Stenotus lanuginosus*) occurs approximately two miles northeast of the project area. No rare plant surveys have been conducted in the project area (except along the access road in 2005 and 2007). Surveys were conducted in both the Parks I and Parks II projects (see Soils Cumulative Impacts) and no special status plants were located on either of those projects. Surveys are planned throughout the project area prior to project activities.

**A. Affected Environment**
The flora of the project area is in the area known as the Modoc Plateau, which is a subdivision of the Great Basin geographical province, as described in the Jepson Manual (Hickman 1993; Oswald 2002). The Silva Flat Allotment lies on the western edge of the Modoc Plateau and the vegetation is characterized by a mix of Great Basin and Cascade Range vegetation types. Vegetation types include sage steppe and Western juniper woodland. These plant communities are described in depth in the Proposed Alturas Resource Management Plan and Final EIS (2007). Common species are listed in the Soils Section under Ecological Sites.

The private landowner has photographs of the Bald Ridges area, approximately one mile west of the project area. The photographs are from the 1950's and show a landscape dominated by sagebrush steppe vegetation. Today these hills and approximately 68% of the project area are dominated by Western juniper.

Many juniper woodlands in the northern Great Basin and the Modoc Plateau are in various stages of succession from early to late development. The stage of woodland development affects fuel loads, wildlife habitat, management operations, cost of conversion and response to treatment (Miller et al. 2000). This overview also applies to the sagebrush steppe as many of these communities have been converted to juniper dominated woodlands and/or annual grassland associations or are at an ecological state of transition that when a disturbance occurs, a threshold will be crossed. Miller et al. (2005 and 2008) described phases of juniper woodland succession in mountain big sagebrush plant associations. The phases are as follows:

> **Phase I-**Trees are present but shrubs and herbs are the dominant vegetation that influence ecological processes on the site
> **Phase II-**Trees are co-dominant with shrubs and herbs and all three layers influence ecological processes on the site
> **Phase III-**Trees are the dominant vegetation and the primary plant layer influencing ecological processes on the site.

In Phase I, the tree canopy cover is open and contains less than 10% of active recruitment by juveniles and saplings. The shrub layer is intact. In Phase II, the tree canopy is actively expanding and is typically at 10 to 30%, approaching 49% depending on the ecological site. Trees are young and interspersed with older dominant trees (80 to 140 years old) and the shrub layer is nearly intact but with significant thinning. The juniper trees in Phase III have reached over 30% canopy cover and some sites are a nearly closed canopy. The shrub layer is greater than 75% dead. The Sage Steppe Ecosystem Restoration Strategy (2008) breaks out juniper classes at 1 to 5%, 6 to 20% and greater than 20% canopy cover.

Based on aerial survey interpretation, Geographic Information System (GIS) database layers, and discussions with BLM resource specialists, the juniper canopy cover in the project area is as follows:

> **1-5% canopy cover:** 22% (316 acres)
> **6-20% canopy cover:** 47% (681 acres)
> **>21% canopy cover:** 21% (310 acres)

It is estimated that 55 acres, or 4% of the project area contains old growth Western juniper. Approximately 86 acres is a dry playa (Juniper Lake). The acreage determination is based on GIS mapping estimates and the total acreage equates to 1,460 acres. The estimates above equate very close to Miller et al's (2005 and 2008) descriptions of ecological phases discussed above.

An ecological threshold (a transition from one state or plant community to another) is crossed when a sagebrush steppe community moves from Phase II to Phase III, when Western juniper shifts from co-dominant to dominant. Coultrap et al. (2008) suggest that a threshold is crossed at

20% juniper canopy cover. Miller et al. (2005) suggest that the ability to predict the pathway of plant succession following removal of juniper by fire or mechanical treatment is relatively high in communities with abundant native grasses and forbs in the prevention stage (Phases I and II). This mostly coincides with Bates et al. (1998 and 2007) who stated that the plant composition during early succession is largely influenced by the pretreatment floristic composition.
Based on the above, 47% of the project area has the potential to cross a threshold to Phase III and the 310 acres currently above 21% cover could become juniper dominated woodland with significantly reduced cover of native shrub and perennial grass vegetation.

**B. Environmental Consequences**

**Impacts of the Proposed Action**
The proposed project is designed to reduce total Western juniper canopy cover to 10% or less. Manual treatments would alter the current vegetative communities, but to varying degrees dependent on the type of juniper removal treatment. Hand felling would remove the juniper and allow shrubs, forbs and grasses to better compete and reproduce.

Overall the impacts of the proposed action are anticipated to be positive. Based on the research that indicates that removing Western juniper in areas in which understory species have been extirpated can potentially restore understory productivity and diversity (Bates et al. 2000).

**Impacts of the No Action Alternative**
Continued dominance and encroachment of Western juniper would continue to extirpate native shrub and herbaceous species greatly reducing biodiversity. In the study conducted by Miller et al. (2008) it was predicted that tree dominated woodlands (Phase III) will increase to 75% of the total woodland within the next 30 to 50 years. As sagebrush steppe/juniper woodlands become more tree dominated, they are less likely to burn under moderate conditions, resulting in infrequent high intensity fires. In the transition of Phase II to Phase III woodlands, the remaining old-growth woodlands are at an increased risk of loss from high intensity fires due to the expansion and increase in tree dominance (Tausch 1999).

**C. Cumulative Impacts**
See Soils Section

**D. Consultation**
N/A

**E. Mitigation**
If BLM special status species are located in the project area, mitigation measures will be implemented to either avoid them or reduce impacts so as not to cause a decline in the reproductive viability of those species.

**F. References**
Bates, J.D., R.F. Miller, and T.J. Svejcar. 1998. Understory patterns in cut western juniper (*Juniperus occidentalis* ssp. *occidentalis* Hook.) woodlands. Great Basin Naturalist 58:363-374.

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Tausch, R.J. 1999. Historic pinyon and juniper woodland development. In: Monsen, S.B.; Stevens, R. comp. Proceedings, ecology and management of pinyon-juniper communities within the interior West; 1997 September 15-18; Provo, UT. Proc. RMRS-P-9: Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 12-19.

USDA. Forest Service. 2008. Sage Steppe Ecosystem Restoration Strategy FEIS. Modoc National Forest, Alturas Field Office BLM. RS-MB-161.

**G. Maps**
N/A

## 11. VISUAL RESOURCES

BLM's Visual Resource Management (VRM) system provides a way to identify and evaluate scenic values to determine the appropriate levels of management. It also provides a way to analyze potential visual impacts and apply visual design techniques to ensure that surface-disturbing activities are in harmony with their surroundings. The VRM system is categorized as follows:

**Class I Objective:** To preserve the existing character of the landscape. The level of change to the characteristic landscape should be very low and must not attract attention
**Class II Objective:** To retain the existing character of the landscape. The level of change to the characteristic landscape should be low

**Class III Objective:** To partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate.
**Class IV Objective:** To provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high.

**A. Affected Environment**

The project area is categorized as a Class III Objective. Visual Resources in the project area are generally associated with recreational activities which include: driving for pleasure, viewing historic mining operations and watchable wildlife opportunities. Much of the area is at higher elevations and affords excellent panoramas and vistas of the adjacent higher mountain peaks and surrounding landscapes.

**B. Environmental Consequences**

**Impacts of the Proposed Action**

Impacts to visual resources as a result of juniper encroachment are associated with vegetation loss which relates to concerns in visual quality, aesthetics and watchable wildlife opportunities. But with juniper removal projects, visual resources and watchable wildlife opportunities are enhanced with mosaics of vegetation and texture. Where juniper has been cut in the uplands and adjacent to the water courses, more diversity has been created in the vegetation, which would enhance visual resources. In general, visual resources and watchable wildlife would have minor to moderate benefits from juniper removal.

Effects to visual quality are positive when juniper is removed, as the landscape gains diversity and texture rather than having a homogenous look. When juniper is cut, a variety of old growth trees, single trees, or small groves and irregular and ragged cut lines are needed to obtain the diverse and enhanced visual look.

The proposed allotment division fence would divide the allotment into two pastures. This would allow for a deferred or deferred/rest grazing system; providing mountain shrubs, riparian vegetation and grasses additional growth. This would provide minor benefits to visual resources. Visual resources would also have minor benefits from an alternate grazing system by providing a mosaic of vegetation patterns.

**Impacts of the No Action**

The impacts of no juniper reduction or a fence would provide a continual decline in vegetation which relates to the loss of visual diversity. No beneficial effects to visual quality would occur with junipers left in place and the landscape would continue to be fairly homogenous with little diversity, structure or texture. Aesthetics and visual quality of riparian areas would continue to diminish with further encroachment of juniper and reduction of riparian vegetation.

**C. Cumulative Impacts**
Cumulative effects from juniper removal would reverse the trend of juniper encroachment and visual resources. Overtime, as more juniper is removed from the landscape wildlife use would increase, which would enhance visual quality. Cumulative effects of the proposed fence would be neutral, as the pastures would be alternately grazed.

**D. Consultation**
N/A

**E. Mitigation**
1. Cutting area boundaries will be irregular and have a ragged appearance to prevent straight lines and "clear-cut" appearance (as per Information Bulletin No. CA-2009-005)
2. Where old growth is sparse, scattered small groves of junipers will be left for VRM and wildlife values (as per Information Bulletin No. CA-2009-005)
3. At the base of rims where no other trees are present except juniper;
    a. Leave juniper and brush uncut with the boundary of the cut lines left with a ragged and irregular look
    b. Leave a minimum of 25 feet of uncut juniper from the rim to a maximum of 100 feet down slope
    c. Leave thirty percent of the vegetation under rim for VRM and wildlife values.
4. Leave large rocky plateaus with old growth and sparse young juniper intact
5. Leave single or multiple trees intact that are within rock piles (to provide for visual diversity)

**F. References**
USDI. Bureau of Land Management. 2008. Proposed Resource Management Plan and Final Environmental Impact Statement, Alturas Field Office. Alturas, CA.

**G. Maps**
N/A

## 12. WATER QUALITY, SURFACE AND GROUND WATER

**A. Affected Environment**
The Hayden Hill Sage-Grouse Habitat Project area lies within the Lower Subbasin 4th Level HUC #18080002 of the Sacramento Subregion. The Lower Pit subbasin is a part of the Pit River subwatershed of the Upper Sacramento Basin watershed. The watershed of the project area is located approximately 17 air miles south of the town of Adin in Lassen County.

Surface water is transported via intermittent creeks that flow into Buckhorn Reservoir (a livestock pit reservoir) and then into Coyote Reservoir southwest of the project area. Water flow

from Coyote Reservoir is controlled for irrigation uses and flows into Dixie Valley, Horse Creek and then into the Pit River at a point approximately three miles northwest of the town of Little Valley. The intermittent creeks in the project area primarily transport water after snowmelt in the winter and spring and after summer thunderstorms.

**B. Environmental Consequences**

**Impacts of Proposed Action**

Removal of juniper may enhance water quality and quantity. Junipers of average size are thought to be water-wasters, losing around 30 to 40 gallons of water per day through evapotranspiration (Bedell et al. 1993). Western junipers are blamed for changing western ecosystems by causing springs and small streams to go dry, endangering fish and other aquatic life, increasing overland flow and soil erosion, reducing the biodiversity of plants and wildlife and reducing forage for livestock and wildlife (Eddleman 1987; Bedell 1987b; Bedell et al. l 993; Miller et al. l987). Miller et al. (2005) however, did note that it is difficult to generalize the hydrological response from one watershed to another due to the variability in soils, geology, slopes and spatial and temporal variations in climate and precipitation that occur across the range of Western juniper.

Initial impacts to water quality will be minimal following juniper treatments. Areas where saturated soils, standing water or flowing water exist will be avoided until they are dried out. Immediate surface water quality impacts may result if a storm occurs, however effects will be temporary. Storm-water runoff may carry loose sediments from the treated areas, but the majority of this will be as overland flow. Moreover, juniper treatments will likely occur during dry or frozen conditions when all flowing water has ceased.

Few watershed-scale studies have been conducted in Western juniper areas to document the impact of juniper on ground water flow. Long-term studies in the Southwest have shown increases in base stream flow after removal of Utah juniper; there was a 157% in annual stream flow over an 8-year period following treatment (Miller et al. 2005). Anecdotal evidence from landowners in Modoc and Lassen Counties indicate springs that were dry in juniper dominated landscapes began flowing after juniper was removed from the sites. In a recent study in central Oregon, Deboodt (2009) did analyze the effects of Western juniper removal on hydrologic function. In 2005, following 12 years of pretreatment monitoring in the 2 watersheds (Mays and Jensen) all post-European aged juniper (juniper < 140 years of age) was cut from the treatment watershed (Mays). Analysis indicated that juniper reduction significantly increased late season spring flow by 225%, increased days of recorded ground water by an average of 41 days and increased the relative availability of late season soil moisture at soil depths of 27 inches.

**Impacts of No Action Alternative**

With no juniper removal, herbaceous vegetation will continue to decline across the project area, bare ground will increase in the interspaces and there could be decreased infiltration and increased erosion. This would be the result of increased Western juniper expansion, especially

from Phase I to Phases II and III. There would be less likelihood of improved hydrologic function in the project area watersheds, there would not be a trend towards the project areas' ability to capture, store and safely release water. This determination is based on studies from and cited in Miller et al. (2005).

**C. Cumulative Impacts**

Cumulative impacts would be positive for improved hydrologic function, improved water quality and improved surface and ground water (recharged, stored and deliverable). Deep soil moisture would be available for shrubs and herbaceous vegetation. The improved vegetation cover and structure in the uplands and riparian areas would also prevent excess moisture in the soil profile from becoming ground water in the form of overland flow and subsequent surface erosion.

**D. Consultation**

N/A

**E. Mitigation**

N/A

**F. References**

Bedell, T.E. 1987b. Range management concerns on juniper woodlands p. 436 429. In: Everett, R L, (Ed.). Proc: Pinyon-juniper conference USDA Forest Serv. Gen. Tech. Rep. INT-215.

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Deboodt, T.L., M.P. Fisher, J.C. Buckhouse and J. Swanson. 2009. Monitoring hydrological changes related to western juniper removal: a paired watershed approach. p. 227-232. *In*: The Third Interagency Conference on Research in the Watersheds, 8-11 September 2008, Estes Park, CO.

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Miller, R.F., J.D. Bates, T.J. Svejcar, F.B. Pierson, and L.E. Eddleman. 2005. Biology Ecology and Management of Western Juniper. Oregon State University Agric. Expt. Sta. Tech. Bull. 152.

**G. Maps**

N/A

## 13. WETLANDS AND RIPARIAN ZONES

### A. Affected Environment

The project area contains two unnamed intermittent streams that support a mix of upland and obligate riparian vegetation. One intermittent stream flows adjacent to the access road on the western boundary of the project area.

There are some unnamed ephemeral drainages running through the treatment area that temporarily transmit water, but do not support riparian vegetation. Ephemeral streams do not have true riparian area characteristics but are hydrologically connected to perennial and intermittent streams (USDI 2003). Due to the temporary ability of these areas to transmit water, they are not considered to express the necessary components of true riparian or wetland areas.

Wetlands do not occur inside the project area, as identified and mapped by the U.S. Fish and Wildlife Service National Wetlands database. Dobe Reservoir occurs approximately 200 meters southeast of the project boundary. No work (either hand or mechanical) would be conducted in or near Dobe Reservoir, therefore there would be no impacts to the reservoir.

### B. Environmental Consequences

**Impacts of Proposed Action**

Positive impacts to riparian areas are similar to those described above in the Water Quality, Surface and Ground Water Section. Because increased Western juniper dominance has been found to result in increased rill formation, surface runoff and sediment yields (Pierson et al. 2003; Miller et al. 2005) removing the post-settlement juniper (less than 140 years old) would allow for native vegetation to re-colonize areas now dominated by Western juniper.

**Impacts of the No Action Alternative**

There would be no impacts to riparian areas from the proposed project. Impacts to riparian areas are the same as for Water Quality. Future wildfires would be larger and hotter, resulting in larger more continuous areas without vegetation cover, thus increasing erosion potential (Pierson et al. 2007; Miller et al. 2005).

### C. Cumulative Impacts

See Water, Surface and Ground Water Section

### D. Consultation

N/A

**E. Mitigation**
If inundated or saturated conditions exist within the project area during scheduled treatment activities, crews conducting the treatment will avoid these areas until they are dry.

**F. References**
Miller, R.F., J.D. Bates, T.J. Svejcar, F.B. Pierson, and L.E. Eddleman. 2005. Biology Ecology and Management of Western Juniper. Oregon State University Agric. Expt. Sta. Tech. Bull. 152.

Pierson, F.B., P.R. Robichaud, K.E Spaeth, and C.A. Moffet. 2003. Impacts of fire on hydrology and erosion in steep mountain big sagebrush communities. P. 625-630. *In:* Renard, K.G. et al. (Eds), First Interagency Conference on Research in the Watersheds, USDA Agricultural Research Service.

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USDA. Forest Service. 2003. Proposed Revised Land and Resource Management Plan, 2003. Jefferson National Forest. APPENDIX C: Definition of Riparian Corridor. http://www.southernregion.fs.fed.us/planning/sa_plans/ Jefferson/lrmp_pdf%5CAppC_ riparian.pdf

**G. MAPS**
N/A

## 14. WILDLIFE

**Threatened and Endangered Species**
No federally listed threatened or endangered species or areas of designated critical habitat have been identified within the project area. The BLM completed a Biological Assessment (BA) for the Sage Steppe Ecosystem Restoration Strategy Final Environmental Impact Statement (Strategy) (USDA 2008), as it relates to the following federally threatened, endangered and candidate species which may be present in the Analysis Area: Modoc (*Catostomus microps*), Lost River (*Deltistes luxatus*), shortnose (*Chasmistes brevirostris*), and Warner (*Catostomus warnerensis*) suckers, Shasta crayfish (*Pacifastacus fortis*), northern spotted owl (*Strix occidentalis caurina*), Carson wandering skipper (*Pseudocopaeodes eunus obscures*), slender Orcutt grass (*Orcuttia tenuis*) and greater sage-grouse (*Centrocercus urophasianus)*.

The BLM determined that implementation of the Strategy would have ***no effect*** on Modoc suckers, Lost River suckers, shortnose suckers, Warner suckers and their applicable designated critical habitat. The Strategy would also have ***no effect*** on Shasta crayfish, northern spotted owl or Carson wandering skipper.

## A. Affected Environment

### Candidate, BLM Sensitive and Sate Listed Species

***Greater Sage-grouse***

In 2005, FWS concluded that the 2003 petition to list greater sage-grouse was not warranted. In 2007, a federal judge overturned FWS decision, ruling that it was "arbitrary and capricious". Due to this, FWS initiated a new status review and listing procedures for sage-grouse. A decision was made in 2010. Sage-grouse were determined to be warranted, but excluded from listing and are currently considered a federal candidate, BLM sensitive and California State listed species.

Greater sage-grouse are heavily dependent on sagebrush habitats and are considered a sagebrush obligate species. Historical and active breeding grounds (leks) on BLM-administered lands are located primarily in low sagebrush habitats. Sage-grouse use sagebrush stands as both winter and nesting habitat. Leks are often located in open areas surrounded by sagebrush (Connely et al. 2000). Sage-grouse most often nest under sagebrush shrubs; successful habitat contains tall grass cover (Gregg et al. 1994). Brood-rearing habitat includes wet meadow and riparian habitats where insects are abundant.

No critical habitat has been designated for sage-grouse by the U.S. Fish and Wildlife Service. However, the project area falls within the Buffalo-Skedaddle Population Management Unit (PMU). The Buffalo Skedaddle Conservation Strategy has been developed for this area which is located in Lassen County (Figure 3).

Currently, only ten percent of all known historical leks are documented as being active within lands managed by the AFO. Approximately 60 percent of all historical leks have been determined to be inactive and the status of the remaining 30 percent is unknown. Quality upland habitat is declining in sagebrush communities and only about ten percent of lands managed by the AFO contain suitable habitat for sage-grouse and other sagebrush obligate species. Juniper encroachment into big and low sagebrush areas, heavy grazing of meadows and springs, conversion to annual grasses and detrimental fires have contributed to the lack of quality sagebrush grasslands throughout the project area.

A total of nine sage-grouse lek sites are located between 1.4 and 2.6 miles northeast of the project area. Protocol surveys were conducted at the nine lek sites and throughout the project area in 2010 and at three lek sites in 2009. No sage-grouse were observed but sage-grouse sign was observed at one lek site during both years. Sage-grouse were also observed on one of the lek sites during surveys conducted in 2006. In addition, the permittee for the Silva Flat Allotment documented three separate sage-grouse sightings within the Hayden Hill area in 2009. The first sighting occurred on June 17$^{th}$ and the permittee observed four sage-grouse. The second sighting occurred on October 7$^{th}$ with two sage-grouse observed. The third sighting

occurred on November 13th and the permittee observed over 15 sage-grouse. The sightings were observed on or near documented lek sites.

***Migratory Birds***

A wide variety of migratory birds may be found in the project area at some point throughout the year. Migratory birds are those that migrate for the purpose of breeding and foraging at some point in the calendar year. Migratory birds may utilize the project area for food, cover and nesting throughout the year.

***Raptors***

Raptors species expected to occur in suitable habitats within the project area include northern harrier *(Circus cyaneus)*, golden eagle (*Aquila chrysaetos*), red-tailed hawk *(Buteo jamaicensis)*, Swainson's hawk (*Buteo swainsoni*), ferruginous hawk (*Buteo regalis*), American kestrel (*Falco sparverius)*, short-eared owl *(Asio flammeus)*, great horned owl *(Bubo virginianus)*, bald eagle (*Haliaeetus leucocephalus*), rough-legged hawk *(Buteo lagopus)*, merlin *(Falco columbarius)*, Cooper's hawk *(Accipiter cooperii)*, northern goshawk *(Accipiter gentilis)* and long-eared owl *(Asio otus)*. Most raptor species nest in a variety of habitats including but not limited to; native and non-native grasslands, agricultural lands, live and dead trees, cliff faces, rock outcrops and tree cavities.

One bald eagle nest is documented 1.5 miles north of the project area and two golden eagle nests have been documented approximately 5.0 miles northeast of the project area (BLM database). Raptor surveys were conducted throughout the project area in 2010 and no raptors or their nests were identified.

***Greater Sandhill Crane***

The greater sandhill crane *(Grus canadensis tabida)* is state listed as threatened. It is commonly found in wetlands, especially along the margins of shallow water where they assemble nests of floating material. Nesting has also been documented on islands. Cranes commonly feed in wet meadows and croplands. They feed on roots, tubers grasses and grains in croplands and will also take earthworms, mice, snakes, frogs, crayfish and various insects.

The project area does not contain suitable greater sandhill crane nesting or foraging habitat. However, sandhill cranes were documented in July of 2010 within the Dobe Flat Reservoir which is located less than 20 meters from the southeast boundary of the project area.

***Pygmy Rabbits***

The pygmy rabbit *(Sylvilagus idahoensis)* was petitioned for federal listing in 2004, but it was determined to not be warranted. The species depends primarily on big sagebrush (*Artemisia tridentata*) located in deeper soils. Soil types can be loamy to ashy and burrows are found greater than 20 inches in depth. In Oregon, overall shrub cover at pygmy rabbit sites ranged from 21 to 36 percent, while bunch grass cover was less at burrows than at random sites. Pygmy rabbit burrows are almost always under big sagebrush. In some instances they are known to use

the burrows of badgers and marmot, as well as other natural cavities or holes in rock or in the ground.

The project area includes the Jellycamp-Karcal-Longcreek Complex soils. This soil type is associated with depths up to and exceeding 20 inches. However, much of the soil types are associated with cobbles, stones and boulders and are indurated beyond 19 inches. These soil characteristics make burrowing highly unlikely. Additionally, only Longcreek soils are associated with mountain big sagebrush. Due to soil and vegetation types, the project area may contain limited if any suitable pygmy rabbit habitat. No surveys have been conducted within the project area.

***Mule Deer***

Mule deer utilizing the project area are part of the West Lassen Herd Unit. This herd unit is composed of Rocky Mountain mule deer (*Odocoileus hemionus hemionus*) with some intermingling Columbian black-tailed deer (*Odocoileus hemionus columbianus*). This herd is largely migratory. However, some of the herd maintain year round ranges and do not migrate.

No Critical Winter Range, Kidding Grounds or Migration Corridors have been identified within the project by CDFG.

***Pronghorn Antelope***

The project area falls within the Lassen Pronghorn Antelope (*Antilocapra americana*) Herd and Management Unit 4. The management unit contains approximately 1.2 million acres of range utilized by antelope; BLM lands encompass 57 percent, private lands 36 percent and Forest Service lands at seven percent.

The Lassen herd was the largest of the California herds in the 1940's. A severe winter in the 1950's resulted in the loss of over half of the herd population. The herd declined from an average of 3,000 to about 400 animals. Since the 1950's, the herd has increased gradually to approximately 1,500 animals in 1981. Current population estimates are not available.

The Lassen herd migrates to and from seasonal ranges in excess of 70 miles; the longest migration known in California. There is some interchange between animals from the Lassen Herd and the adjoining Likely Tables Herd.

Kidding Grounds and a Stress Migration Corridors have been identified within the project by CDFG.

**B. Environmental Consequences**

Candidate, BLM Sensitive, Sate Listed and ungulate species discussed above may be impacted by the Proposed Action and Alternative as follows;

## Impacts of the Proposed Action

### *Sage-grouse*

Substantial long-term benefits for sage-grouse and other sagebrush obligate species would occur under the Proposed Action once junipers are controlled and the site is restored. Benefits include: increasing the availability of forage (grasses and forbs), enhancing sage-grouse nesting, wintering and brood rearing habitats, reduction in predator perches and increasing water into springs, seeps, and ephemeral streams which would provide water longer into summer months. This project may also facilitate relocation of sage-grouse into the area.

Temporary negative impacts may occur during the construction of the proposed pasture fence. Long term impacts include sage-grouse collisions with the proposed fence and an increase in perches for avian species which prey on sage-grouse.

### *Migratory Birds*

Human activities likely displace migratory birds farther than simply the physical habitat disturbance. Noise generated from vehicles and machinery can be troublesome for songbirds by interfering with the males' ability to attract mates and defend territory and the ability to recognize calls from conspecifics during the breeding season (USDI 2003). Additionally, junipers and sagebrush serve as food, shelter and nesting habitat for many migratory birds. Project activities would result in direct habitat loss.

Although direct habitat loss would occur under the Proposed Action, not all junipers would be removed from the project area. Six percent of junipers would remain intact, in addition to all old growth and all mountain mahogany stands within the project area.

### *Raptors*

Some impacts to nesting and/or foraging birds are anticipated during project activities. Human activities in close proximity to active raptor nests may interfere with nest productivity. Romin and Muck (1999) indicate that activities within 0.5 miles of a nest are prone to cause adverse impacts to nesting raptors. If activities occur during nesting, they could be sufficient to cause adult birds to remain away from the nest and their chicks for the duration of the activities. This absence can lead to over heating or chilling of eggs or chicks. The prolonged disturbance can also lead to the abandonment of the nest by the adults. Both actions can result in egg or chick mortality. In addition, routine human activities near these nests can draw increased predator activity to the area and increase nest predation.

Substantial long-term benefits for raptor species would occur under the Proposed Action once junipers are controlled and the project area is restored. Benefits include an increase in foraging habitat due to a potential increase in small mammal populations.

The proposed fence would increase available perch locations for raptors within the project, potentially increasing hunting opportunities.

***Greater Sandhill Crane***

Although sandhill cranes have been identified within close proximity of the project boundary, suitable sandhill crane habitat is not present within the project area. Additionally, no personnel or equipment would enter Dobe Flat Reservoir or its associated meadow and it is unlikely that sandhill cranes would utilize or migrate north into the project area due to the lack of suitable habitat. No negative impacts to sandhill cranes are anticipated from project activities. Once junipers are controlled and the project area restored, sandhill crane habitat may be enhanced by additional water into Dobe Flat Reservoir.

***Pygmy Rabbits***

As no roads, skid trails, landings or mechanical treatments are being proposed; no negative impacts to pygmy rabbits are anticipated. Substantial long-term benefits for pygmy rabbits would occur under the Proposed Action once junipers are controlled and the project area is restored. Benefits include increasing the availability of forage and cover as grasses and sagebrush become established.

***Mule Deer and Pronghorn Antelope***

The Proposed Action would result in short-term negative impacts to mule deer and pronghorn within the project area. Short-term negative impacts include increases in noise from chainsaws, vehicles and equipment and human presence within the project area. Pronghorn and mule deer may be temporarily displaced during project activities and impacts would be greatest if activities occur during winter months. Winter ungulate diets are “sub-maintenance”, meaning they lose weight and body condition as the winter progresses. Survival below the maintenance level requires behavior that emphasizes energy conservation. Canfield et al. (1999) pointed out that forced activity caused by human disturbance exacts an energetic disadvantage, while inactivity provides an energetic advantage for animals. Geist (1978) further defined effects of human disturbance in terms of increased metabolism, which could result in illness, decreased reproduction and even death.

Installation of fences can contribute to the mortality of mule deer and pronghorn antelope. Fences act as a barrier to daily movement and seasonal migration and deter young, making them more vulnerable to predation and road kill. Fences may lead to entanglement and eventual mortality, particularly during times of winter stress (Colorado Division of Wildlife).

Substantial long-term benefits for ungulates would occur under the Proposed Action once junipers are controlled and the project area is restored. Benefits include increasing the availability of forage (grasses and forbs), primarily in areas where bitterbrush is present. The reduced juniper cover would also allow more water into springs, seeps, and ephemeral streams; increasing water availability longer into the summer months.

**Impacts of the No Action Alternative**
The No Action Alternative would result in the continued presence of dense juniper and a potential increase in juniper canopy, which would further reduce the quality of wildlife habitat for many species. Loss of forage and reduced quality of shrubs within the project area due to juniper is already a limiting factor. Juniper treatments are needed to improve the area for sage-grouse, ungulates, pygmy rabbits, raptors and other wildlife utilizing the project area.

**C. Cumulative Effects**
Several juniper removal projects have been completed in the immediate area and have benefitted wildlife, recreation, livestock, and soils. On BLM lands, over 1,000 acres have been treated mechanically and manually. The permittee treated 640 acres on their bordering property since September of 2007 and have plans to treat additional acres. The expansion of Western juniper removal within and surrounding the project area will continue to enhancement wildlife habitat.

**D. Consultation**
The BLM completed a Biological Assessment (BA) for the Sage Steppe Ecosystem Restoration Strategy Final Environmental Impact Statement (Strategy) (USDI 2008), as it relates to the following federally threatened, endangered and candidate species; Modoc, Lost River, shortnose and Warner suckers, Shasta crayfish, northern spotted owl, Carson wandering skipper, slender Orcutt grass and greater sage-grouse. The BLM determined that implementation of the Strategy would have ***no effect*** on the above species.

**E. Mitigation**

*Sage-grouse*
1. Downed junipers will be piled outside of potential sage-grouse habitat preferably in natural openings where feasible.
2. Downed junipers will be lopped and scattered outside of lek sites or potential nesting and wintering habitat.
3. If an active sage-grouse lek is documented during sage-grouse surveys a two or three-mile buffer will be applied to the lek.
4. No new permanent fences will be constructed within 1 mile of an active lek site.
5. The proposed pasture fence will be modified with deflectors in order to make the fence visible to wildlife (Attachment 1).

*Raptors*
1. Raptor surveys will be required within suitable habitat if project activities are scheduled between February 1st and August 31st.
2. If active raptor nests are identified within the project area, buffers will be applied in accordance with the Alturas RMP, Table 2.24-3, *Seasonal Restrictions and Distance Buffers for Wildlife* (page 2-133), in order to reduce the risk of decreased productivity or nest failure.

3. Juniper trees with nests will not be cut.

*Pronghorn Antelope*

1. Limit project activities on the southeast portion of the project area from November 1 through March 31 and April 1 through June 15, in the areas listed below due to pronghorn Migration Corridors and Kidding grounds, respectively.
    a. Township 36 North, Range 9 East, Section 15 (East of Juniper Lake) & Sections 23-24
    b. Township 36 North, Range 10 East, Section 30
2. Pronghorn surveys will be conducted during the migration and kidding seasons in the following areas:
    a. Township 36 North, Range 9 East, Section 22, specifically NENE, SWNE, NWSE, NESE, SWSE and SESE aliquot parts.
3. The proposed fence will have deflectors installed in order to make the fence visible to wildlife (Attachment 1).
4. The proposed pasture fence will be modified to allow for the safe passage of wildlife both under and over the fence. Fence modifications will follow BLM Fencing Manual H-1741-1, *Standard Bureau Modifications to Meet Multiple-Use Needs,* which includes the following;

| Number of Wires (maximum) | Fence Height (maximum) | Wire Spacing (from ground up) | Wire Type | Number of Stays (between posts spaced 16.5-30 feet) |
|---|---|---|---|---|
| 3 | 38 inches | 16, 10, 12 (inches) | Bottom smooth | One w/post at 16.5 feet, 1 or 2 w/ post at 30 feet |

5. In addition to the above fence specifications, wildlife openings within the fence may be constructed due to the close proximity of the proposed fence to pronghorn migration corridors and kidding grounds. This will affect fence construction in the following locations and will be determined on site by the staff biologist:
    a. Township 36 North, Range 9 East, Section 15 (East of Juniper Lake) & Sections 23-24
    b. Township 36 North, Range 10 East, Section 30

**F. References**

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Pyshora, Leo. 1977. The Pronhorn Antelope in Northeastern California. Wildlife Management Administrative Report Number 77-2. Sacramento, CA: California Department of Fish and Game.

Reynolds, T. 1984. Daily Summer Movements, Activity Patterns and Home Range of Pronghorn. *Northwest Science* 58:300-311.

Romin, Laura A., and Muck, James A. May 1999. Utah Field Office Guidelines For Raptor Protection From Human And Land Use Disturbances. U.S. Fish and Wildlife Service, Salt Lake City, Utah

USDI. Bureau of Land Management. 2003. Final EIS and Proposed Plan Amendment for the Powder River Oil and Gas Project. Buffalo Field Office. Buffalo, WY.

USDI. Bureau of Land Management. 2008. Proposed Resource Management Plan and Final Environmental Impact Statement, Alturas Field Office. Alturas, CA.

USDA. Forest Service. 2008. Sage Steppe Ecosystem Restoration Strategy Final EIS. Modoc National Forest and BLM Alturas Field Office. Alturas, CA.

**G. Maps**
See Figures 1-3

## CHAPTER 4: OVERALL CUMMULATIVE IMPACTS

The Council on Environmental Quality (CEQ) regulations that implement NEPA defines a cumulative impact as: "The impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions, regardless of which agency or person undertakes them." Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

The area of the Proposed Action and the surrounding area have been impacted to some degree by various actions including, but not limited to livestock grazing, various recreation activities, prescribed fire, juniper removal and installation of fences. The present condition of resources analyzed in this document is indicative of the level of past impacts. The analysis of the required elements evaluates the overall effect on the environment from the Proposed Action. Since there are no anticipated increases in other land uses within the project area or surrounding areas that

would cumulatively interact with proposed project activities to create additional impacts on the resources and land uses analyzed, the cumulative impacts would be negligible.

# CHAPTER 5: COORDINATION/PREPARERS

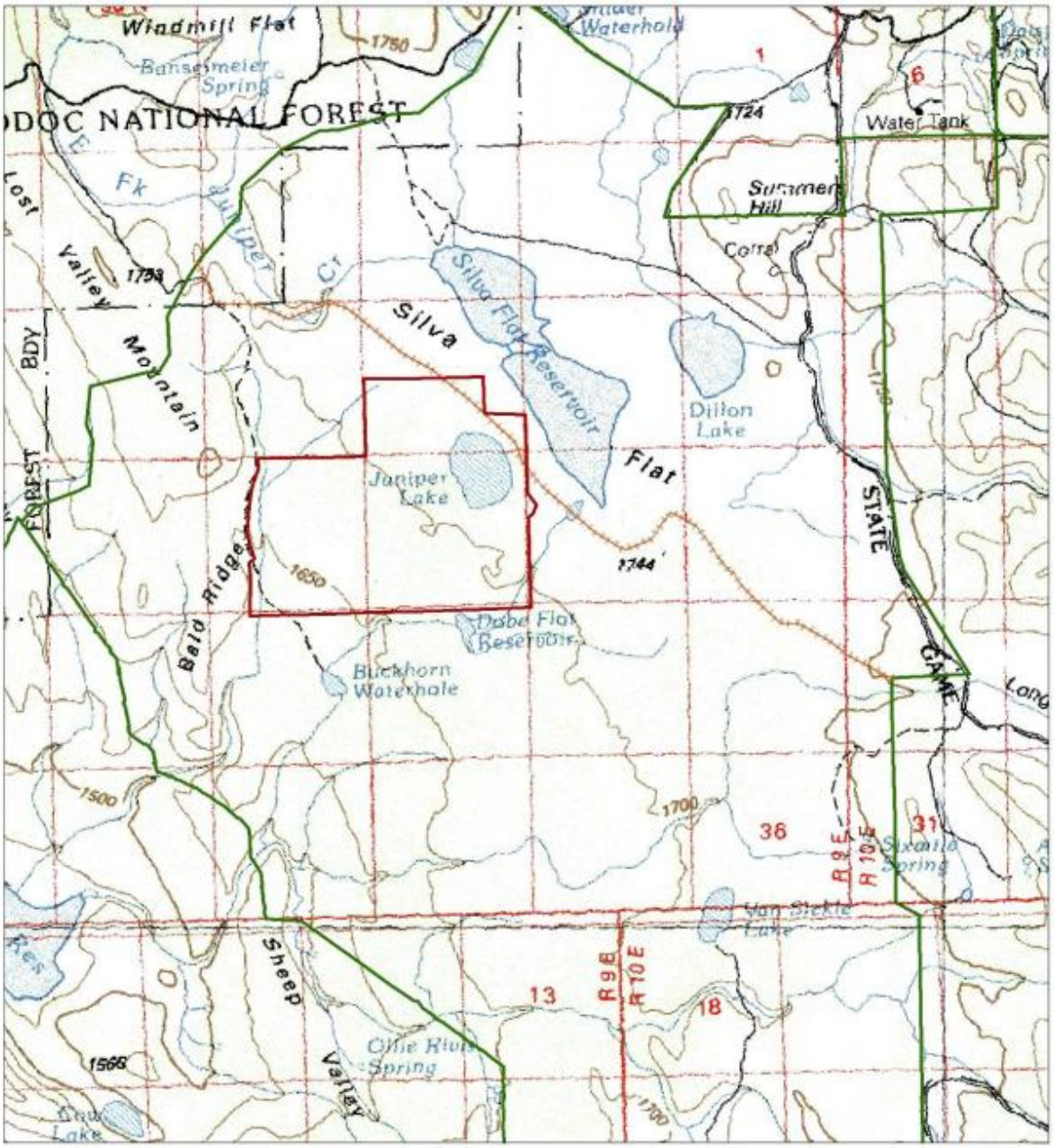
## COORDINATION

California Department of Fish & Game (Alturas & Redding, CA offices)
Center for Biological Diversity
Jerry and Buck Parks c/o Parks Ranch, Permittee
Pit River Tribe
Western Watershed Project

## PREPARERS

| Name | Resource/Activities | Project Role |
|---|---|---|
| Arlene D. Kosic | Wildlife Biologist/Wildlife T&E | Project Lead/ Interdisciplinary Team |
| David J. Scott | Cultural/Native American Concerns/Historical Resources | Interdisciplinary Team |
| Claude F. Singleton | ACEC/Recreation and Wilderness/ Travel and OHV/Visual Resources | Interdisciplinary Team |
| Alan Uchida | Noxious Weeds | Interdisciplinary Team |
| Michael Dolan | Range Management/Soils/Vegetation T&E/Wetlands & Riparian | Interdisciplinary Team |
| Kiley Whited | Rangeland Management Specialist | Interdisciplinary Team |
| Emily S. Jennings | Realty Specialist/Environmental Coordinator | Interdisciplinary Team |

**Figure 1.** Hayden Hill Sage-Grouse Project-Area Map




**Legend**

Hayden Hill Revised Juniper Removal Unit 3-15-2010.shp

Sliva Flat Proposed Fence

Silva Flat Allotment

**Hayden Hill Sage-Grouse Project 2010**
**Proposed Juniper Removal Unit and Division Fence**

0 0.125 0.25 0.5 Miles

**Figure 2.** Hayden Hill Sage-Grouse Project Juniper Density-Aerial Map

**Hayden Hill Sage-Grouse Project**
**Juniper Density-Aerial Map**
**revised 3-15-2010**

**Legend**

Hayden Hill Revised Juniper Removal Unit 3-15-2010.shp

0.03[illegible]675 0.15 Miles

**Figure 3.** Sage-Grouse Population Management Units

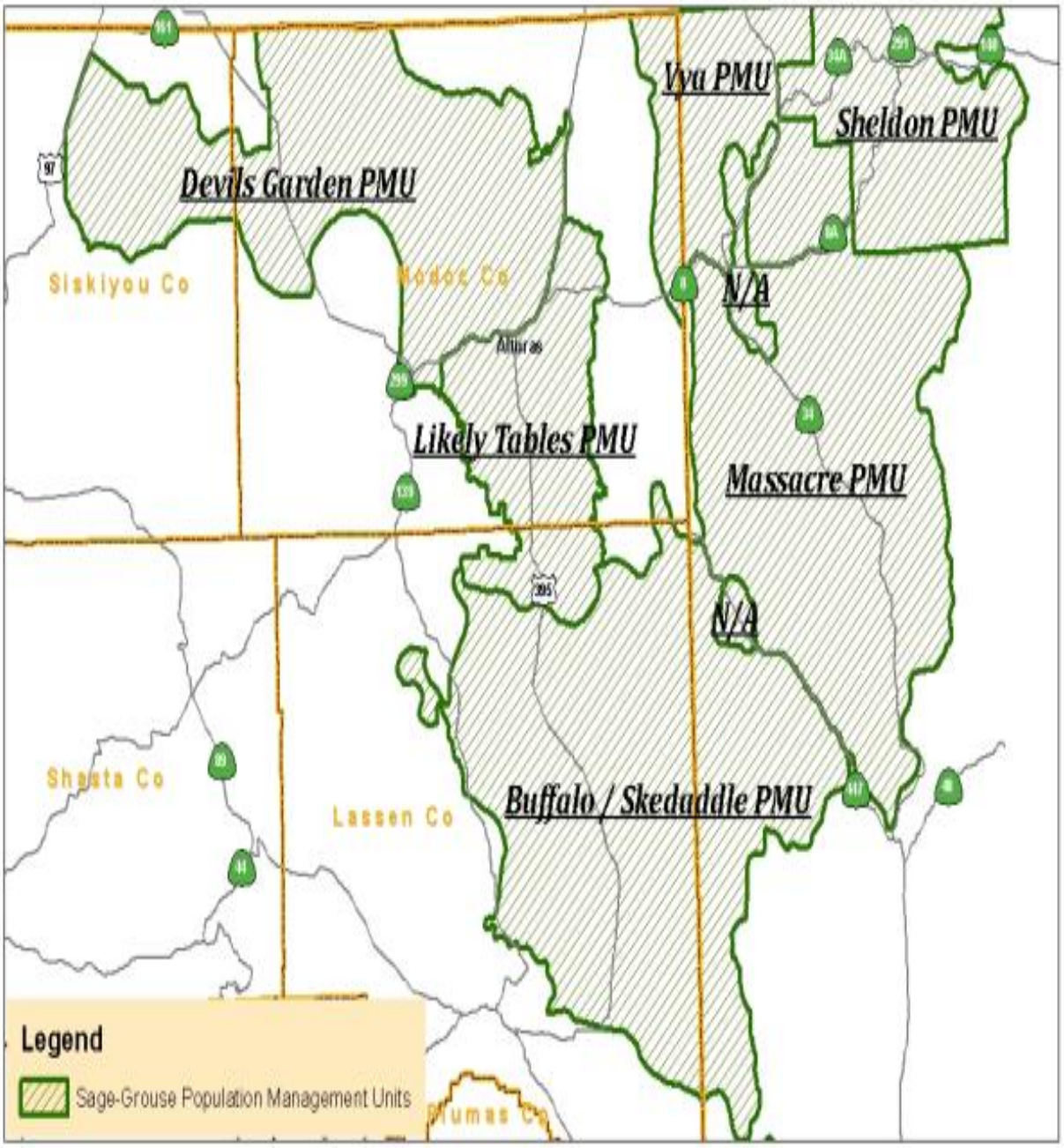


**Figure 4.** Noxious Weed Map

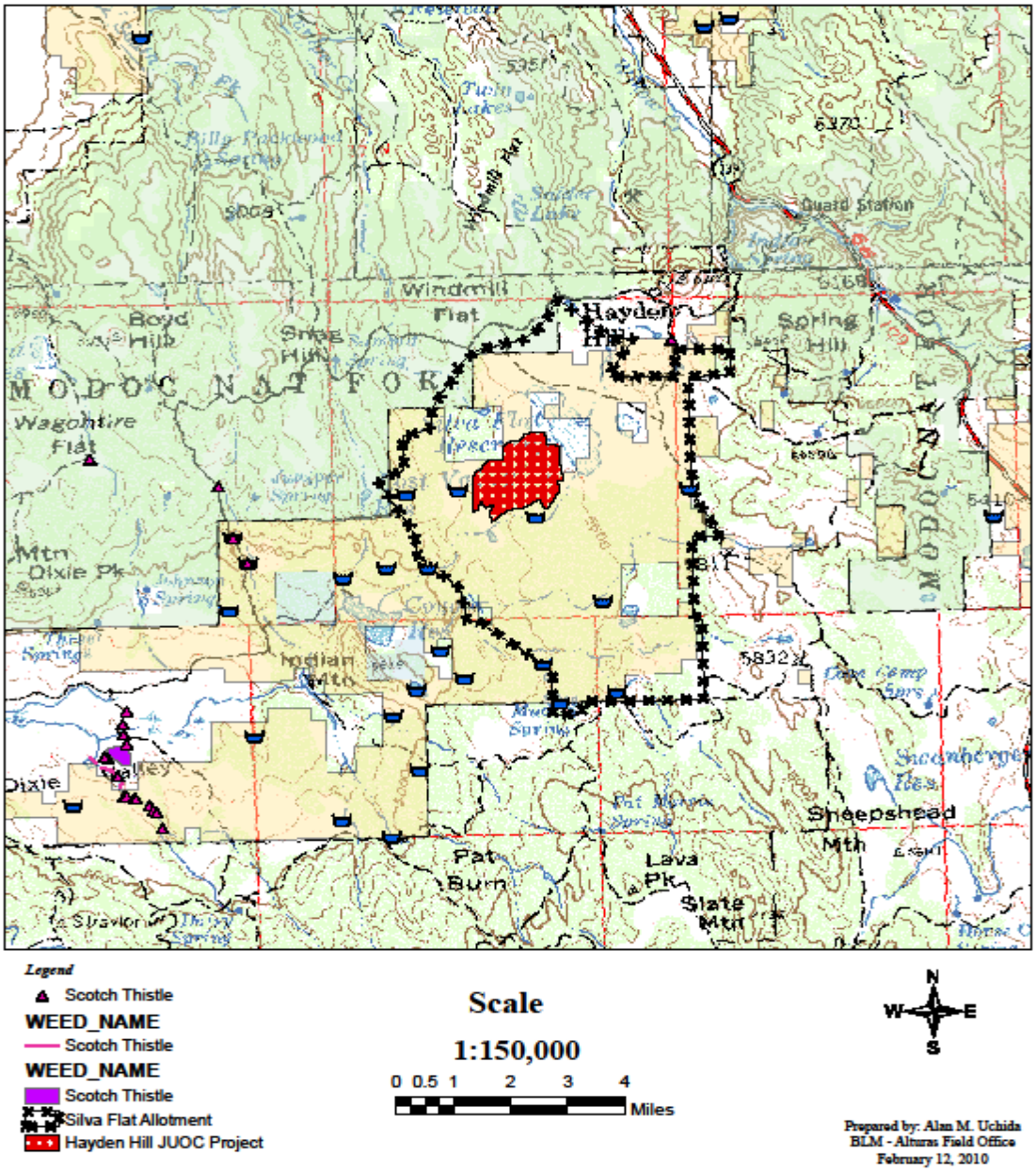


**Figure 5.** Livestock Shade Tree

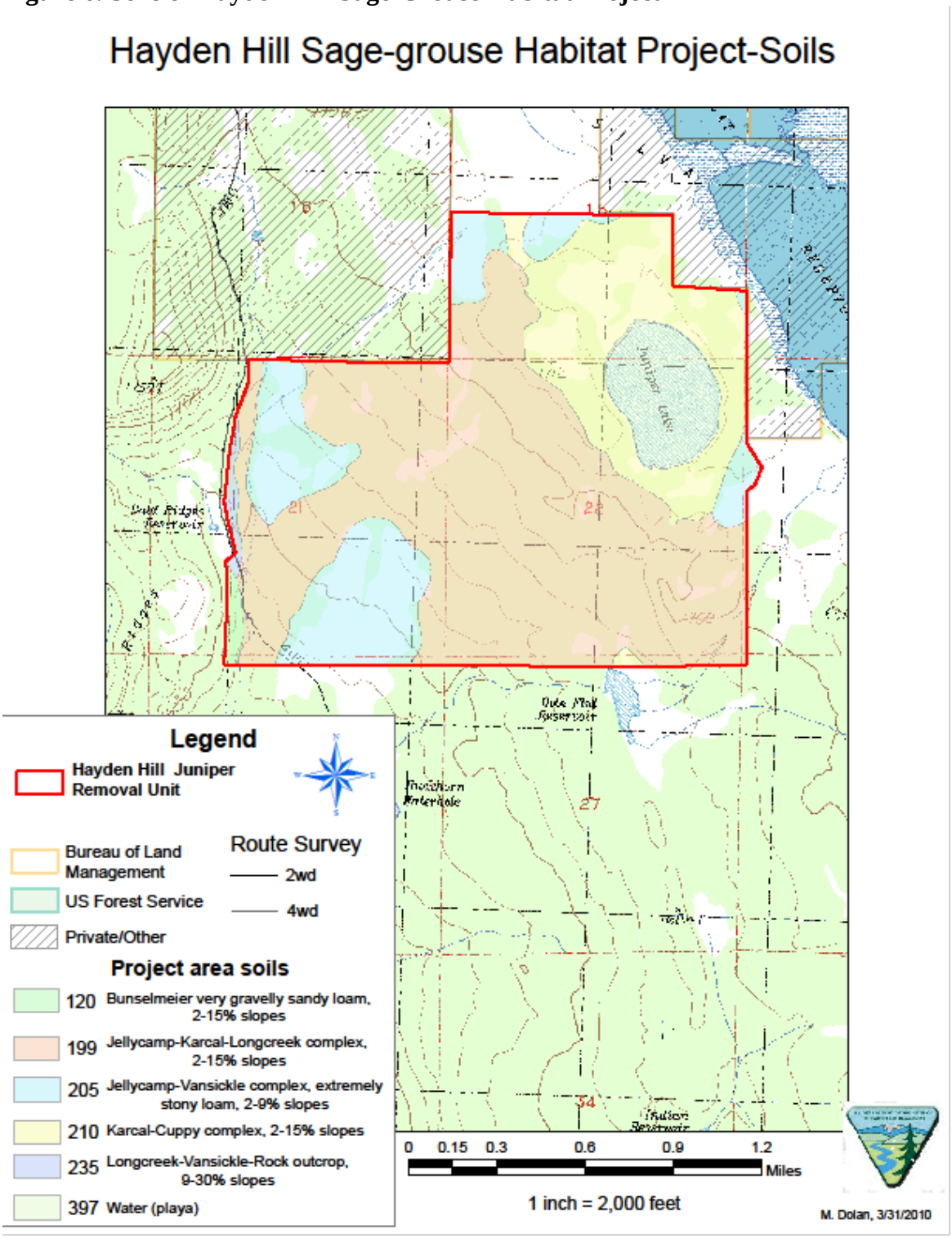



**Figure 6. Soils of Hayden Hill Sage-Grouse Habitat Project**