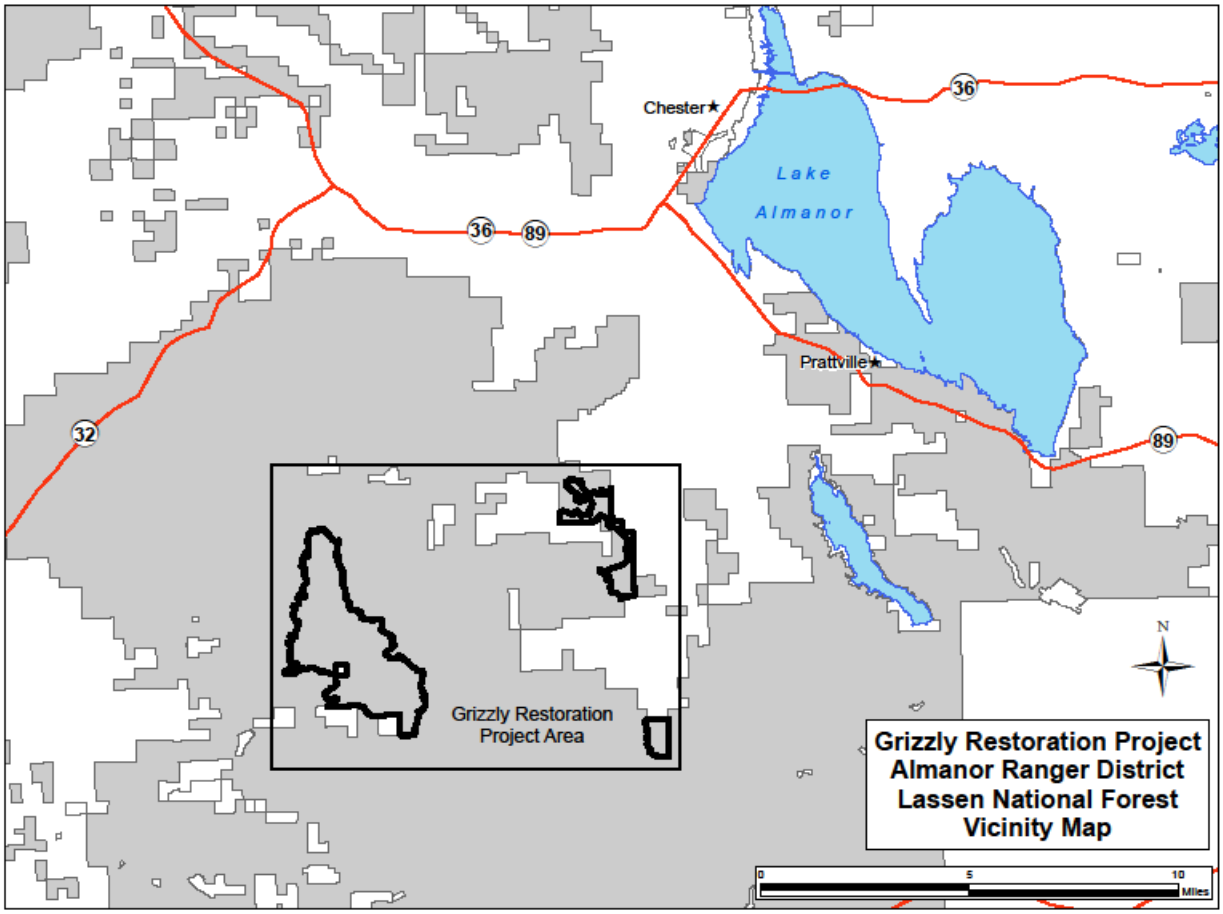
Grizzly Restoration Project
Almanor Ranger District, Lassen National Forest
Butte County and Plumas County, California
May 5, 2015

Introduction

The Almanor Ranger District, Lassen National Forest, proposes a forest restoration project southwest of Humbug Valley, California. The proposed project would be located in the Butt Creek (MA37), Soda Ridge (MA45), and Jonesville (MA44) management areas of the Lassen National Forest in parts of Butte and Plumas counties. The analysis area is approximately 5,900 acres located in sec. 4, 8-10, 14-17, 21-23, and 26 T. 26 N. R. 5 E.; sec. 2, 3, 11, 25, 26, and 36 T. 26 N., R. 6 E.; sec. 33 T. 27 N., R. 5 E.; sec. 27, 34, and 35 T. 27 N. R. 6 E., Mount Diablo Meridian. The project area ranges in elevation from 4,150 feet to 7,200 feet. Conifer trees are the dominant vegetation type and include Jeffery pine, mixed conifer, white and red fir communities. There are also small inclusions of black oak and aspen hardwood stands, pine plantations, and meadow complexes.



The proposed project would be consistent with and designed to implement resource management activities and components of the 1992 Lassen National Forest (LNF) Land and Resource Management Plan (LRMP) and 1993 Record of Decision (ROD), as amended by the Sierra Nevada Forest Plan Amendment (SNFPA) ROD (2004), and the Management Indicator Species (MIS) amendment (2007).

Purpose of and Need for Treatment

The purpose of the proposed Grizzly Restoration Project is to retain and restore ecological resilience of National Forest System lands within the project area. The proposed Grizzly Restoration Project is intended to:

- increase forest health, habitat diversity, and vegetative diversity;
- reintroduce fire into fire-adapted ecosystems, and reduce the wildfire threat to human communities, ecosystems, and wildlife habitat;
- move watershed processes and functions toward the attainment of Aquatic Conservation Strategy (ACS) goals, Riparian Management Objectives (RMOs), and Standards and Guidelines;
- support research proposals developed to guide future management activities; and,
- contribute to community economic stability.

Forest Vegetation: Desired Condition, Existing Condition, and Need

The 2004 SNFPA ROD and publications such as the GTR-220 *An ecosystem management strategy for Sierran mixed-conifer forests* (North, Malcolm et.al. 2009) and GTR-237 *Managing Sierra Nevada Forests* (North, Malcolm ed. 2012.) provide descriptions of healthy forest stands that include high levels of horizontal and vertical diversity in both the overstory and understory, and vegetation patches that vary in size, density, species composition, and structure. Within the Grizzly Project area, forested stands would support a shifting mosaic of habitat conditions at a landscape scale. The reduced density of forested stands would accelerate the development of large trees and improve stand resiliency to disturbances such as epidemic levels of insects and high severity wildfire. Dense forest patches would contribute to habitat connectivity and support species dependent on areas of higher canopy cover; open forest patches would support shrubs and other understory vegetation. Late-seral structural attributes including large tree groups, overstory decadence, snags, and down logs would support wildlife species dependent on these habitat features.

Vegetation communities within the Grizzly Restoration Project area have changed over time as a result of past management actions, including fire exclusion. Present conditions within the proposed Grizzly Restoration Project area include overly dense stands composed mainly of shade-tolerant conifers, such as white fir. These dense conditions contribute to the further encroachment and establishment of small-diameter, shade-tolerant trees.

There is a finite amount of biomass that can be supported in any stand, and the maximum density of a stand is controlled by the resources available on the site. Different tree species tolerate different maximum densities. Stand density index (SDI) is one measure of stand density and is based on the number of trees per unit area and diameter at breast height (dbh) of the tree of average basal area. SDI converts a stand's density to trees per acre at a constant reference size of 10 inches dbh and is often expressed as a percentage of the maximum SDI for a particular forest type. As stands exceed 60 percent of maximum SDI, tree growth and vigor is severely impacted by inter-tree competition and stands are prone to large-scale insect and disease outbreaks and stand replacing fire.

Stand Density Index (SDI)
Measurement of stand density index is a very useful tool to predict present or future susceptibility of a stand to drought-related or insect-caused mortality. The stand density index (SDI) is a quantitative measurement that expresses tree frequency and tree size into a standardized numeric value, or SDI. This numeric value can be used to compare different stands and different treatments.
The density of a stand is ultimately limited by resources such as soil moisture and growing space. Research has shown that when a stand approaches 60 percent of the stand's maximum SDI, the inter-tree competition for resources and the risk of mortality from insect, disease, and drought begin to increase.

SDI will be used as a resource indicator and measure to compare stands' current and desired conditions, as well as to describe proposed actions. Within the Grizzly Restoration Project area, approximately 88 percent of the proposed treatment area is near or above 60 percent of maximum SDI[1]. There is reduced horizontal and vertical structural diversity and decreased ability of these stands to adapt in the face of natural disturbance and uncertain future environmental conditions.

The difference between the desired condition and current condition within the proposed Grizzly project area shows a need to improve conifer growing conditions and resilience to disturbance, including fire, and to increase structural diversity in both mature stands and plantations. There is a need to modify the current forest structure and improve or maintain habitat for wildlife. There is a need to address the increased stand density in order to decrease competition for available soil moisture, and increase plant vigor, increase growth rates of shade-intolerant pine species, increase resilience to pests, and to mitigate drought stress.

Fire and Fuels: Desired Condition, Existing Condition, and Need

The 2004 SNFPA ROD emphasizes reducing threats to communities and wildlife habitat from large, severe wildfires and reintroducing fire into fire-adapted ecosystems, including making demonstrated progress in moving acres out of unnaturally dense conditions. Goals for managing fuels described within the 2004 SNFPA ROD include: 1) strategically placing fuel treatments across landscapes to interrupt potential fire spread; 2) modifying canopy fuels to reduce the potential for spread of crown fire; and 3) removing sufficient material in treatment areas to reduce wildland fire intensity, thereby contributing to more effective fire suppression and fire-fighter safety.

[1] The maximum SDI was calculated by the Forest Vegetation Simulator software, Inland California and Southern Cascades Variant, and is an average of the maximum SDI for the individual species within the stand.

Past conditions provide a historic context against which to measure current and desired conditions. The historic fire regime for Grizzly Restoration Project area is primarily categorized in Group I[2]. This classification represents areas with a fire return interval ranging from 0 to 35 years. Eighty-two percent of the Grizzly Restoration Project site has not experienced fire within the last 100 years. As a result, the fire return interval departure data for the Grizzly project area places the majority of the project area in a fire regime condition class 3 (FRCC 3), meaning there is a significant departure (greater than 66 percent) from the natural (historical) fire regime and/or vegetation dynamics and characteristics (fuel composition; fire frequency, severity and pattern; and other associated disturbances).

Fire environment is based on topography, weather, and fuels. Available fuels is the element that we can affect through strategic landscape treatments to safely reintroduce and manage fire and to reduce impacts from wildfires. Fuels resource indicators and measures for the Grizzly Restoration Project include flame length, fire type, P-torch, and fire regime condition class. The desired fire type throughout the Grizzly Restoration Project area is a mosaic, but primarily surface fire exhibiting an average flame length of four feet or less, and a less than 20 percent probability of initiation of crown fire during 90th percentile weather conditions.

There are two primary factors that must be present to initiate torching and crown fire in a stand. First, there must be a surface fire that is intense enough to ignite the canopy fuels. Second, the conditions must be in place to sustain the spread of a crown fire. These conditions include canopy base heights low enough to be ignited by surface fire, and wind speeds fast enough, slopes steep enough, and canopy bulk density great enough to support fire moving through the stand. The P-Torch reflects the probability that a surface fire can move up into the crown layer. The lower the P-Torch value, the less susceptible a stand is to the vertical movement of fire.

Torching situations ● P-Torch
A torching situation is generally defined as one where tree crowns of significantly large trees are ignited by the flames of a surface fire or flames from burning crowns of small trees that reach the larger trees. P-torch is a stand-level torching index that estimates the probability of finding a torching situation in a forest stand, identifying those places in a stand where trees are present and torching is possible.

Canopy characteristics are critical to the development and movement of crown fires, from torching to active crown. We know that canopy bulk density and canopy base height are two of the key components in determining initiation and propagation of crowning. As a stand becomes denser, the stand is more vulnerable to active crown fires because crown fires can occur at lower wind speeds. Gaps in the canopy continuity are effective in reducing propagation of torching into active crowning. The higher the canopy base height, the less susceptible a stand is to initiation of torching and crowning from surface fire. This can also be seen as a separation of the surface fuels from the canopy fuels. Ladder fuels are those fuels (i.e., small trees, shrubs, etc.) that actually connect the surface fuels to the canopy fuels layer. A decrease in abundance of

[2] The fire regime and condition class data is from the fire return interval departure (FRID) dataset from USDA Forest Service, Pacific Southwest Region Remote Sensing Lab (http://www.fs.fed.us/r5/rsl/clearinghouse/r5gis/frid/).

ladder fuels would also decrease the frequency and severity of torching and crowning in wildfires. Anthropogenic and natural fire played a key role in the ecosystem as a natural disturbance mechanism that would reduce ladder fuels, increase canopy base heights, reduced stand densities (canopy bulk density) and maintained heterogeneity in a mixed severity fire regime. The heterogeneity of forest structure and the canopy in this project area is important in restoring and retaining a fire resilient landscape for the present and possible future conditions with climate change.

Predicted fire behavior within the Grizzly Restoration Project area as modeled in the Fire and Fuels Extension to the Forest Vegetation Simulator (FFE-FVS) under 90th percentile weather conditions is shown in Table 1. Fuels resource indicators and measures include flame length (in feet), fire type, probability of torching (P-Torch), and fire regime condition class.

Table 1. Fire behavior measurement indicators. Existing and desired outputs modeled in FEE-FVS under 90th percentile weather conditions.

Measurement Indicators	Existing Condition		Desired Condition
	Grizzly Restoration Fuel Type		
	average	range	
Flame length (feet), total	87	4 to 154	<4
Fire type (surface, passive, active, conditional crown)	Active	Surface to Active	Surface only
P-Torch (probability of torching)	62%	0 to 100%	<20%
Fire regime condition class	3 (95% of area)	1 to 3	Fire regime condition class 2, moving toward condition class 1

Source: Forest Vegetation Simulator-Fire Fuels Extension (FVS-FFE), preliminary results from ALRD Fuels Shop.

The current stand structure, predicted fire behavior, and current fire regime condition class, support a need to manage fire on the landscape; reduce the predicted size, intensity, and severity of fires within the project area; reduce the potential for detrimental effects of large-scale, high-severity wildfire; move the project area along a trajectory towards achieving fire regime condition class 1; and contribute to safer conditions under which fire fighters can implement fire suppression actions.

Riparian Habitat Conservation Areas and Riparian Conservation Areas: Desired Condition, Existing Condition, and Need

Lands adjacent to streams, meadows, and other wetlands on the forest are referred to as Riparian Habitat Conservation Areas (RHCAs) in anadromous watersheds or Riparian Conservation Areas (RCAs) in non-anadromous watersheds. RHCAs and RCAs are composed of wetlands, wet meadows, lakes, fens, springs, and seasonal and perennial streams. The term "aquatic feature" refers to all of those features. Table 2 shows the designated width of the RHCA from the edge of the feature of these areas.

Table 2. Riparian Habitat Conservation Widths (measured from the edge of the aquatic feature)

Aquatic Feature	RHCA width
Perennial stream	300 ft.
Seasonal stream	150 ft.
Lake, wet meadows, fens, wetlands, springs	300 ft.

Watersheds within the Project Area: Existing and Desired Conditions

Upper Butte Creek

The western half of the project area is located within the Upper Butte Creek (fifth-field) watershed. Upper Butte Creek is managed as an anadromous fish-producing watershed. As such, management direction for the Upper Butte Creek watershed is found under both the 2004 SNFPA ROD and the 2001 Long-Term Strategy for Anadromous Fish-Producing Watersheds (USDA, 2001). The Long-Term Strategy includes Aquatic Conservation Strategy (ACS) goals, Riparian Management Objectives (RMOs), and Watershed Management Objectives (WMOs) that provide a description of desired conditions to sustain and restore aquatic and riparian systems. Existing conditions within the Upper Butte Creek watershed that do not meet desired conditions as described under the ACS goals provide the impetus for management actions within the watershed.

The Upper Butte Creek watershed is subdivided into nine sixth-field subwatersheds. The Grizzly Project area overlaps three of these subwatersheds: Scotts John Creek (BU16), Cold Springs (BU12), and Butte Creek House (BU10). A Watershed Analysis (WA) was completed for the Upper Butte Creek watershed in 2000, and amended in 2006. Key findings from the WA with regards to the three subwatersheds of concern include the following:

- Near-stream road densities exceed desired conditions for Scotts John Creek and Cold Springs. As described under the Long-Term Strategy, the desired condition for near-stream road density is less than 3 percent. As of 2006, near-stream road density was 6.8 percent for Scotts John Creek and 4.7 percent for Cold Springs.
- Stream bank stability values were below the desired condition of greater than 80 percent stability in the Cold Springs subwatershed (Willow Creek). This was attributed to poor road locations and historic logging practices in the area.
- The streams in the Scotts John and Cold Springs subwatersheds are located in non-rhyolitic soils. Pool tail fines (fine sediment) values exceeded desired conditions of less than 15 percent fines for tributaries in

non-rhyolitic soils (USDA, 2001). The WA cites poor road locations, grazing, and historic logging practices as the primary causes for elevated pool tail fines.

- As of 2005, vegetation inventories of the RHCAs of the Scotts John Creek, Cold Springs, and Butte Creek House subwatersheds exceeded desired conditions for fuel loading and stand density. Approximately 55 percent of Scotts John Creek, 81 percent of Cold Springs, and 66 percent of Butte Creek House RHCA acres exceeded desired conditions for both fuels and stand density. White fir (*Abies concolor*) was cited as the primary species responsible for the high fuel loading and overstocking of conifer stands within RHCAs.
- The WA identified restoration opportunities, including reducing near-stream road density, with highest priority for the Scotts John Creek subwatershed, and applying vegetation management actions in RHCAs to reduce heavy fuel loading and decrease conifer stand density.

Additional field data was collected in the years following completion of the Upper Butte Creek WA, up to 2014. This field data included stream inventories, common stand exams, and fuels transects. Near-stream road densities and stream sedimentation remained the same as described in the WA (outside of desired conditions). Fuel loading and stand densities continued to increase in the years following the 2006 WA amendment, and remain in excess of the desired conditions.

Yellow Creek

The eastern half of the Grizzly Project area is located in the Yellow Creek (fifth-field) watershed. Unlike Butte Creek, Yellow Creek is not managed as an anadromous fish-producing watershed, and the 2001 Long-Term Strategy for Anadromous Fish-Producing Watersheds does not apply. Management direction specific to fish and riparian areas for the Yellow Creek watershed is described in Chapter 4 of the 1992 Lassen National Forest LRMP and in the 2004 SNFPA ROD.

The 2004 SNFPA includes an Aquatic Management Strategy (AMS) for management of aquatics and riparian areas at the landscape level. Within the AMS are Riparian Conservation Objectives (RCOs) that direct management of watersheds and aquatic ecosystems at the project level towards the goals described within the AMS.

Both the 1992 Lassen LRMP and the 2004 SNFPA ROD describe desired conditions for aquatic and riparian areas in non-anadromous watersheds. Stream and riparian area surveys conducted within five sixth-field subwatersheds (Humbug Valley, Upper Yellow Creek, Lemm Hollows, Grizzly Creek, and Soda Creek) of the Yellow Creek watershed identified areas where desired conditions were not being met. The Grizzly Project area includes proposed treatments within RCAs of one sixth-field subwatershed: Lemm Hollows. Key findings from field surveys include the following:

- Vegetation inventories within RCAs identified fuel loading as exceeding desired conditions within the Lemm Hollows subwatershed.
- Conifer stand densities within the Lemm Hollows RCAs were identified as exceeding desired conditions for stand health and not meeting desired conditions for species diversity.

Purpose of and Need for Treatment in RHCAs and RCAs

As identified in the watershed analysis, there is a need to implement management actions to move the RHCAs within the Butte Creek watershed on a trend towards achieving the desired conditions described under the Long-Term Strategy for Fish-Producing Watersheds (USDA, 2001). Existing conditions for near-stream road density, stream sedimentation, fuel loading, and conifer stand densities do not meet desired conditions. Management actions proposed under the Grizzly Restoration Project would address the issues described above, and implementation would proceed within the standards and guidelines established by current direction.

As identified with field surveys, there is a need to reduce fuel loading and decrease stand densities within RCAs in the Lemm Hollows subwatershed (Yellow Creek watershed) to trend these RCAs toward desired conditions described in the 1992 Lassen LRMP and 2004 SNFPA ROD. Management actions would be implemented within the standards and guidelines established by current direction.

Meadows

The footprint of a meadow is determined by a combination of vegetation, soils, topography, and hydrology. Meadow communities provide natural openings in an area dominated by coniferous forests, as well as ecosystem services and functions. Meadows are found in areas with a high water table which supports a variety of plant species, enriching biodiversity and providing habitat for non-forest bird and insect species. Historically, fire played a role in maintaining the spatial extent of these meadow communities by killing tree seedlings that established along the forest/meadow edges and providing disturbance to renew meadow vegetation.

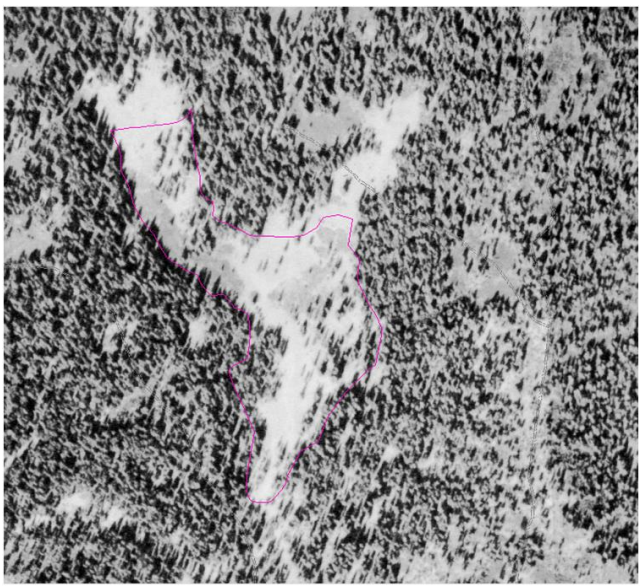


Figure 1. Meadow unit 327 - aerial photo 1941

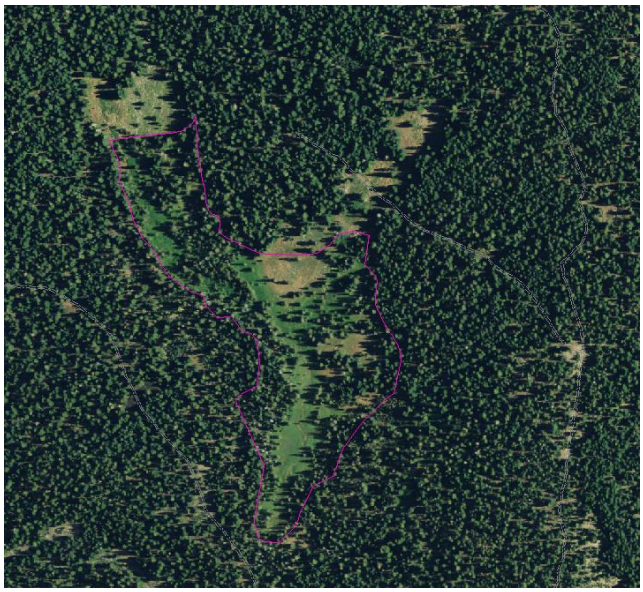


Figure 2. Meadow Unit 327 - aerial photo 2012

Desired conditions for meadows in the 2004 SNFPA ROD describe meadows that are hydrologically functional, with vegetation roots occurring throughout the soil profile. Sites of accelerated erosion, such as gullies, are stabilized or recovering. Desired meadow conditions would enhance floodwater retention and

groundwater recharge, and root masses would stabilize stream banks against cutting action. Riparian conservation objectives direct us to preserve, restore, or enhance these features.

The number and density of trees encroaching into the meadow communities in the Grizzly Project area have increased since fire has been excluded from these ecosystems. Figure 1 and Figure 2 are a photo comparison of proposed meadow unit 327. Photo comparisons of meadow areas, such as this one from 1941 to 2012, show a shift from open meadow to conifer-dominated areas. The establishment of conifers within the meadows demonstrates trending changes in meadow function, compromising the long-term (50 years or more) sustainability of these meadows.

There is a need to reduce the number of conifers that have established within the meadows to support the natural openings and vegetation diversity that meadows provide within a conifer-dominated forest. There is a need, as well, to reintroduce fire as a disturbance mechanism, encouraging meadow vegetation diversity and cover while retaining meadow complexes on the landscape. Movement toward desired conditions would be measured by change in acres of open meadow habitat and expansion of the meadow footprint shown by increased meadow associate species.

Springs

The 2004 SNFPA ROD includes a riparian conservation objective to maintain or restore the characteristics of special aquatic features, including springs. The distribution and health of biotic communities would continue their presence in the landscape.

There is a spring located within unit 327 of the proposed Grizzly project area. The vigor of the vegetation around the spring is low, and the spring exhibits the effects of conifer encroachment and trampling by livestock. Stream banks have been disturbed, and there is an incised channel near, though not part of, the spring.

There is a need to protect this aquatic feature and decrease the effects of conifer encroachment and livestock activity on banks and soil erosion so that the vegetation associated with the springs can return to a range of natural variability appropriate to the site.

Aspen

Aspen is a disturbance-dependent, fire-resilient, shade-intolerant species that requires sufficient sunlight to maintain stand vigor and reproduction. Aspen communities provide many ecological services in western montane forests because they are one of the few deciduous forest types present. Aspen communities support an abundance of birds, mammals, insects, and understory plants that provide forage and hiding cover for wildlife and livestock. A healthy aspen stand typically contains multiple age classes, includes healthy regeneration, and is resilient to wildlife browse and other types of disturbance.

Region 5 aspen health assessments conducted within the Grizzly Project area concluded that the aspen within the project area are in declining health. Within the project area, competition with overtopping conifers for sunlight has compromised aspen vigor. Many aspen are dead or dying, and are not being replaced by young, vigorous aspen. Stands in the project area have a limited age-class distribution and are considered vulnerable to

disturbance. There is a need to improve the health and vigor of the aspen stands in the Grizzly Restoration Project area and protect understory and regenerating aspen until the aspen regeneration grows above the browse line. The changes in aspen stands following treatment would be measured by successful aspen regeneration that survives to a height of five feet and greater, and an increase in the number as aspen stems.

Transportation

A managed road system provides for safe public access and travel, and contributes to economical and efficient management of National Forest System lands. The LNF LRMP provides direction to maintain all roads and related structures to protect resources, meet contractual obligations, provide an efficient transportation system to serve both current and anticipated management objectives, and comply with the LNF Motorized Travel Management ROD (2010).

The current transportation system within the project area consists of National Forest System roads and county roads. There are also unauthorized routes within the project area. The existing transportation system within the proposed Grizzly project area shows a need for changes to the system in order to provide access for current and anticipated management needs. Surveys show excessive sedimentation of project-area streams from near-stream roads and inadequate drainage features. A review of the existing transportation system shows:

a. Existing system roads need maintenance and repair to decrease sediment delivery to creeks and meet riparian management objectives (RMOs). The project area contains system (Forest roads 26N11 and a portion of Forest road 26N84) and non-system roads near stream channels and in riparian areas, as well as stream crossings not needed for future management activities. There is a need to decommission system and non-system roads and stream crossings not needed for future management activities to meet resource objectives, to comply with the LNF Travel Management ROD (2010), and to address adverse effects to the watershed.

b. Existing roads would be utilized where available; however, there is a need for new road construction, temporary roads, and stream crossings to accomplish fuels and vegetation management objectives proposed with this project.

c. Water sources are used for project implementation, and in support of transportation system use and fire suppression. There is a need to bring water sources within the project area up to best management practice (BMP) standards.

d. Rock gravel is the desired surfacing material because it provides structural support and protects the road when wet, and provides better roadway drainage, decreasing the amount of erosion and sedimentation into stream channels. Currently, there are no local rock quarries to provide rock material to the project area. There is a need to develop a cost-effective rock gravel source to provide surfacing material to accomplish road maintenance and watershed improvements.

Research Proposals

There is an ongoing need to support research that informs future management actions. The location of the Grizzly Restoration Project, its forest cover-types, and its proximity to the Storrie Fire area provide the opportunity to accommodate three research proposals received from the Pacific Southwest Research Station (PSW).

I. Canopy Cover Studies: Effects on understory development and potential interaction with disturbance methods.

Western forest ecosystems have changed dramatically in structure and composition over the past century. Managing these forests has become a great challenge to forest managers. When mechanical thinning is used, the first target of thinning in the prescription is usually canopy cover. The desired level of canopy cover must be balanced with a variety of ecosystem services. Forest canopy cover plays a primary role in determining what tree and understory vegetation establishes and how fast it grows, directly or indirectly affecting a variety of forest resources.

There is a need to determine an optimal canopy cover to enhance the health and function of forest ecosystems, the resiliency of forests to either wildfire or biotic disturbances, and provide forest managers and policy makers a solid, scientific basis for effectively treating hazardous fuels without diminishing wildlife habitat and other ecological services.

II. Enhancing health and function of oak-dominant stands through an appropriate stand density mitigation

California black oak *(Quercus kelloggii)* is the most widely distributed oak species in California, spanning a north-south range of about 780 miles and an altitudinal range of 650 to 7,900 feet. It is a valuable forest resource that has a rich history of cultural, wildlife, and livestock importance. However, because black oak has little commercial use other than as firewood, information in its management is limited. The condition of black oak communities has been affected by a number of factors, including drought, disease, animal foraging, logging practices, fire suppression, and a variety of other human impacts. What were once open oak and conifer stands, often dominated by pine, have been gradually taken over by shade-tolerant fir species. Once conifers overtop the oak, competition for necessary resources such as light, water, and nutrients increases, and oak crown, as well as mast production, is reduced. Eventually, the oak will succumb.

Mast is the nuts, seeds, buds, or fruit of trees and shrubs that is eaten by wildlife.

There is a need to determine an optimal stand density for a healthy oak-dominant stand in high elevations of the northern Sierra Nevada to help inform future management aimed at sustaining healthy, resilient black oak stands on the landscape.

III. Radial release of large trees in a mixed-conifer forest: quantifying radius distance to improve vigor

The large, old trees in the forest are not only a sharp contrast to the smaller, younger trees surrounding them, but are a very important part of wildlife habitat and provide inspiration to many people. These trees provide structure to our forests and record a history of climate and disturbance events for the stands they occupy.

Direction found in the 2004 SNFPA ROD for National Forest System lands in the Sierra Nevada region calls for retaining trees with a diameter of 30 inches dbh and greater in any vegetation management projects. Simply leaving these trees uncut, however, may not be enough to ensure they remain on the landscape. Many disturbances, biotic and abiotic, can pose a threat to these trees, and dense stand conditions increase the risk from wildland fire, intensify competition for natural resources (water, nutrients, and light), and decrease resistance to insect and disease attacks.

Silviculture treatments to enhance the vigor and longevity of these trees are being applied in National Forest System lands with increasing regularity. A current silvicultural treatment, commonly referred to as "radial release", thins all vegetation around the subject tree sometimes using a diameter-based rule for the radius of the thin. This type of radial-release treatment has not been experimentally tested, and land managers lack information in Westside habitats to quantify the space that provides adequate natural resources to retained trees. There is a need to provide forest managers a solid recommendation toward the proper distance for radial release of large, old, pine trees to enhance old tree health and function in a mixed conifer forest.

Economics and Community Stability

The Forest Service has a role to play in sustaining industry infrastructure and sustaining part of the employment base in rural communities. There is an ongoing need to support local rural communities by providing a wood supply for local industry and sustain a part of the employment base in rural communities. There is a need to retain industry infrastructure and support the ability of public managers to manage overstocked stands and accomplish ecological objectives in the Lassen National Forest. Measurement indicators to analyze contributions to economics and community stability would include the total number of acres treated, total cost, volume of sawlog and biomass products, and number of jobs created or sustained.

Proposed Action

The objectives outlined in the Purpose and Need would be addressed through thinning, prescribed fire (pile burning and underburning), and conifer removal throughout the project area. Treatments would be implemented utilizing commercial timber sales, stewardship contracts, service contracts, and the work of Forest Service personnel. Proposed actions for the various components of the project area are described in the following sections. Table 3 displays acres of each type of action proposed. Appendix A displays the proposed actions by unit number, proposed treatment, acres, and post-implementation fuels treatment.

Thinning treatments would be intended to ensure that stand densities do not exceed an upper limit of 60 percent of maximum SDI for at least 20 years after thinning. Stand densities would range from 35 to 50 percent of maximum SDI following thinning.

Cost-efficient treatments would maximize the number of acres treated under a limited budget. Where consistent with desired conditions, area treatments would be designed to be economically efficient and meet multiple objectives. Revenues from the sale of commercial timber products would be obtained from some fuels

and forest health treatments. These revenues would help to offset the cost of subsequent fuel reduction, forest health, and watershed restoration projects.

Table 3. Acres by treatment proposed.

Treatment	Acres*
Area Thin (includes 659 acres within home range core area (HRCA)	2,963
Plantation treatments (thin, masticate, and/or replant) (includes 32 acres within HRCA)	134
Meadow Restoration	55
Aspen Enhancement	40
Research proposals (includes 48 acres within HRCA)	73
Fuels only – underburn	91
Quarry development	10
Total	3,366

*All acres approximate and affected by rounding

Vegetation Treatments

Concepts from the Pacific Southwest Region General Technical Reports, An Ecosystem Management Strategy for Sierran Mixed-Conifer Forests (GTR 220) and Managing Sierra Nevada Forests (GTR 237) would be applied to meet the desired conditions for the project area. In areas proposed for mechanical treatment, mechanical, ground-based equipment would be utilized on slopes up to 35 percent to harvest trees greater than or equal to 3.0 inches in diameter at breast height (dbh) to less than 30 inches dbh. Whole-tree yarding would be used when possible. Hand treatments would occur in areas such as rocky or steep slopes, or streamside areas where equipment cannot be used. Hand treatments include felling trees less than 30 inches dbh, and lopping and scattering or piling and later burning. Activity generated landing slash would be machine piled and burned.

Within treatment areas, trees 30 inches dbh and larger and conifer snags 15 inches dbh and larger would be retained within the limits of safety and operability, with the exception that no dead or dying trees would be retained within 150 feet (or one tree length) of Forest road 26N02, Forest road 26N27, Forest road 27N04, and

Butte County road 91513 (Humbug Summit road). Trees 30 inches dbh and larger and conifer snags 15 inches dbh and larger that are felled for safety and operability would be left on site for wildlife and other resource considerations. Trees 30 inches dbh and larger that are felled for new road construction would be removed.

Forested Communities (Area Thin – 2,963 acres)

Area thin prescriptions would enhance the health and vigor of stands by reducing density-related stress and insect and disease mortality, particularly in the large tree component, and aid in protecting stands from high-severity wildfire. Trees would be thinned using a modified thin from below prescription (AT) to vary density throughout a treatment unit. Trees would be retained in a mosaic of highly clustered groups of trees separated by lightly treed or open gap conditions. Target stand densities following thinning would range from 35 to 50 percent of maximum SDI appropriate to the forest cover so that stand density would remain at or below 60 percent of the maximum SDI for 20 years after thinning to minimize the need for re-entry.

Mechanical thinning treatments in mature forest habitat (CWHR types 4M, 4D, and 5M) would retain at least 40 percent of the existing basal area, an average of 40 to 50 percent canopy cover, and meet the management standards and guidelines set forth in the 2004 SNFPA ROD. Average residual basal area by treatment unit would be determined based on forest cover, site quality, and existing stand attributes. Current SDI and basal area by forest cover are displayed in Table 4. Basal area is the cross-sectional area of a tree bole measured at dbh and is used as a measure of density on a per-acre basis (square feet per acres). Basal area can be used to display the changes in a forest stand.

Table 4. Current SDI and basal area in the Grizzly project by forest cover[3]

Forest Cover	Current Average Percent Max SDI	Current Percent Max SDI Range	Current Average Basal Area (sq.ft./acre)	Current Basal Area Range (sq.ft./acre)	Post-treatment Basal Area Range (sq.ft./acre)
Pine or white fir dominated mixed conifer	72	49-85	240	160 - 333	100 - 160
White fir	72	46-89	296	175 - 503	130 - 220
Mixed true fir	78	56-90	344	216 - 459	140 - 240
Red fir	78	54-85	348	191 - 464	140 - 240

Variable density thinning would meet the need for increased levels of horizontal and vertical diversity, increased vegetation diversity, and improved forest health while retaining or promoting important wildlife habitat attributes. Variable density thinning would be applied to emulate the patchy effect of fire on the landscape. Trees would be left in dense clumps around habitat features such as snag patches, clumps of trees 16-inches dbh or

[3] Data in this table is based on stand exam data collected between 2011 and 2014, processed with the Forest Vegetation Simulator forest growth simulation model available at http://www.fs.fed.us/fmsc/fvs .

greater with interlaced or touching crowns, areas with large downed logs, high stumps, or trees which show decadence or decay where those features are currently available, or around areas expected to develop the habitat features described. Openings would be created or enlarged around areas with existing shrubs or understory vegetation, evidence of past shrub occurrence, pockets of diseased trees, or adjacent to healthy pine seed trees. Pockets of dense, healthy, understory trees would be retained throughout the treatment area. Clumps of trees and openings would range in size from 0.1 to 0.5 acres. In unit 49, small 0.1 to 0.25 acre openings would be centered where plants of *Silene occidentalis* ssp. *longistipitata* are currently overtopped by conifers (in occurrences #6C and #6D) to enhance habitat for this understory species.

Trees that are suppressed, of considerably poor health, or appreciably diseased would be removed in favor of retaining healthy trees. A component of healthy understory trees would be retained to promote structural diversity. Healthy, shade intolerant pine (ponderosa, sugar, western white, and Jeffrey) and Douglas-fir would be favorably retained over shade-tolerant red and white fir trees, where appropriate.

Radial release is proposed as a research component, and the research proposed actions are described below. Radial release is also proposed as a component of vegetation treatments throughout the proposed project area and could be implemented around one selected single pine tree or group of pines (sugar, ponderosa, western white, and Jeffrey) per acre, with a focus on retaining large pine in the treatment area. Radial release would consist of removing some or all conifer trees that are less than 30-inches dbh adjacent to the release tree, or group of trees, for a distance from the bole of 30 feet. Trees selected for radial release would be those already exhibiting or expected to develop habitat attributes such as platforms, mistletoe brooms, forked tops, and cavities, which are preferred by late-seral species and, where they exist, pine trees exhibiting flat, platy bark, broad, flat topped crowns, and large diameter branches would be selected first for radial release.

Additional radial release is proposed to encourage the persistence of oak trees (e.g. *Quercus kelloggii*) found within the Grizzly Restoration project area. Currently, oak is known only to be found in stands 20, 21, 23, 24, 502, and 503. To meet objectives within these stands, oak would be released as follows:

- Stands 20 and 24 are mixed conifer stands with occasional scattered oak trees. An average of two oak trees per acre would be released by removing conifer trees within 10 feet of the crown of oak trees 3-inches dbh and larger or sprouting oak trees that were 3-inches dbh and larger prior to the Chips fire. Trees 30-inches dbh and larger and up to two healthy pine or Douglas-fir trees would be retained within the release distance.
- Stands 21 and 23 are hardwood stands with a component of mixed conifer trees. Conifer trees within 10 feet of the crown of oak trees 3-inches dbh and larger or sprouting oak trees that were 3-inches dbh and larger prior to the Chips fire would be removed. Trees 30-inches dbh and larger and up to two healthy pine or Douglas-fir trees would be retained within the release distance.
- Stands 502 and 503 are mixed-conifer cover and oak enhancement research stands, respectively, and treatment would implement the research study.

If isolated oak trees are found elsewhere in the project area, they would be released from conifer competition for a distance of 30 feet from the edge of the oak tree crown, as has been implemented in other oak

enhancement projects. Removing competing trees within this distance is intended to maximize the retention of these isolated oak trees. Trees 30-inches dbh and larger and up to two healthy pine trees would be retained within the release distance. No more than two oak trees per acre would be released.

Home Range Core Areas (Area Thin)

Approximately 673 acres of suitable nesting habitat [California Wildlife Habitat Relationship (CWHR) system 4M and 4D] and 66 acres of non-suitable nesting habitat (CWHR 3M, 3D, 4P) in California spotted owl home range core areas (HRCA) would be treated using the modified thin from below prescription described above. Table 5 displays the forest cover and stand numbers within HRCAs, as well as average SDI and pre- and post-treatment average basal area information. Suitable nesting habitat includes plantations and canopy cover research plots within plantations and mixed conifer stands. Non-suitable nesting habitat includes oak and oak/conifer stands and oak enhancement research plots. CWHR 4M and 4D plantations and mixed conifer stands would retain an average of 40 percent canopy cover to minimize re-entry and enhance black oak and sugar, ponderosa, and Jeffrey pine trees. CWHR 4M and 4D high elevation true fir and red fir stands would retain an average of 50 percent canopy cover. Proposed treatments in the CWHR 3M, 3D and 4P stands would enhance oak and pine trees and promote forest health consistent with owl habitat objectives.

The plantations in the HRCA were initially planted in 1964 and 1965. After thinning, shrubs would be masticated. In unit 146, windrows containing top soil and root wads created as site preparation prior to planting would be spread and redistributed throughout the plantation.

Table 5. Average SDI, Basal Area, and post-treatment Basal Area for stands within HRCA

HRCA – Forest Cover Current Conditions	Stand Numbers	Average Percent Max SDI	Percent Max SDI Range	Average Basal Area (sq.ft./acre)	Current Basal Area Range (sq.ft./acre)	Post-treatment Basal Area Range (sq.ft./acre)
plantations	25, 124, 146, 157, 501	85	83 - 86	240	177 - 293	100 - 120
mixed conifer/ white fir	20, 30, 42, 49, 50, 147, 180, 243, 325, 502	72	52 - 85	286	188 – 379	130 - 190
true fir/red fir	58, 65, 67, 81	86	85 - 90	426	400 - 475	240 - 280
non-suitable nesting habitat	21, 23, 24, 40, 503	58	43 - 74	167	134 – 181	80 - 120

Plantations

There are four existing plantations proposed for treatment in the Grizzly project outside of the HRCA and research projects. These four plantations would be treated as follows:

- Unit 128 (5 acres), initially planted in 1975, would be mechanically, commercial thinned as described in forested communities – area thin above. After treatment, shrubs would be masticated.

- Unit 28 (26 acres), initially planted in 1993, would have shrubs and small trees masticated.
- Unit 66 (15 acres), initially planted in 1993, would have shrubs and small trees masticated, followed by low density planting of pine species.
- Unit 71 (56 acres), initially planted in 1993, would have shrubs and small trees masticated followed by low density planting of pine species.

Planting in units 66 and 71 would comply with Region 5 stocking guidelines. Site preparation for planting would be hand treatment of competing vegetation at the time of planting. Planting performance would be monitored after the 1st and 3rd years. Sites planted with trees should be certified of establishment five years after planting. Future release could be required after planting to improve survival of the planted conifers and would be completed by either manual grubbing or mechanical release (mastication). Herbicides would not be used. Animal control actions such as protective barriers or trapping may be used.

Riparian Habitat Conservation Areas

All applicable best management practices (BMPs) would be implemented. BMPs are described in Water Quality Management for Forest System Lands in California, Best Management Practices (USDA FS, 2010) and the 2004 SNFPA ROD. Soil standards and guidelines would be implemented throughout the project area and are described in the LNF LRMP (1993), the 2004 Sierra Nevada Framework Plan Amendment ROD (2004), and the USFS Region 5 Soil management Supplement No. 2500-2012-1 (2012). Except as specified below, treatments in RHCAs would be the same as treatments in the surrounding upland vegetation types (see Table 6), within the parameters of integrated design features (IDFs) designed to protect riparian features (see page 25). The IDFs modify treatments to address soil and watershed concerns, e.g. limiting streamside mechanical treatment, retaining trees for bank stability, etc.

Table 6. Acres of RHCA and RCA proposed for treatment

Proposed Treatment	Riparian Habitat Conservation Area (RHCA)	Riparian Conservation Area (RCA)
Area Thin	293	46
Aspen enhancement	26	0
Meadow	55	0
Research	0	3
Fuels only	26	0
Total RHCA or RCA acres proposed for treatment	400	49

Thinning would focus on removing ladder fuels and thinning overcrowded stands to reduce competition for resources among conifers and promote tree growth. Variable density thinning would encourage horizontal and vertical structural diversity. Other than in aspen enhancement units, an average of 40 or 50 percent canopy cover would be retained throughout the RHCA where it currently exists. Pockets of dense, healthy, understory trees would be retained throughout the treatment area. Trees needed for stream bank stability would be identified and retained, and mechanical equipment would be permitted to operate up to the limiting distances described in Table 9 and the IDFs. All conifers 30 inches dbh and greater and snags 15 inches dbh and greater would be retained within the limits of safety and operability. Trees 30 inches dbh and larger and snags 15 inches dbh and greater that are felled for safety or operability would be left on site for wildlife and other resource considerations. Hand thinning of conifers is proposed in areas where mechanical equipment is restricted (see integrated design features for RHCAs).

Existing surface fuels and fuels produced by implementation activities would be hand-piled or grapple-piled. Hand and grapple piles would be placed at least 25 feet from riparian hardwoods and would not be placed where there is existing riparian vegetation. Piled fuels would be burned either within the units or at landings. Where they exist, down logs 12 inches in diameter and greater would be retained to meet wildlife and other resource needs.

In the RHCA along Scotts John Creek, units 326 and 328 adjacent to proposed aspen enhancement units are proposed for mechanical treatment. Trees needed for stream bank stability would be identified and retained, and mechanical equipment would be permitted to operate up to 25 feet from the edge of Scotts John Creek. Units 321, 322, 323, 325, and 330 along Scotts John Creek are proposed for hand treatment. Trees 10 inches dbh and smaller would be felled by hand, retaining bank stability trees, hand-piled, and the piles burned. The RHCA within units 41 and 69 along the main-stem of Scotts John Creek would receive the same hand treatment.

Mechanical treatment in the thinning units 42, 48, 49, 71, and 93 along Forest road 26N11 in the Scotts John Creek drainage would extend to the currently existing roadbed.

The RHCA along Willow Creek in units 32, 46, 52, 60, and 121would be treated by hand. Trees up to 10 inches dbh would be felled by hand, hand piled, and the piles burned.

A small (less than 0.25 acres) portion of a research plot within unit 25 falls within the mechanical restriction zone for Water Creek, though it is located over 100 feet from Water Creek. Site-specific field review by a qualified specialist determined no anticipated potential effect from mechanical treatment within this small piece of the RHCA; therefore, mechanical equipment would be permitted to operate within the RHCA mechanical restriction zone in unit 25.

Meadow

Conifers would be removed from meadow units 320, 324, 327, and 329. The meadow footprint would be determined by existing understory meadow vegetation, soils, hydrology, and changes in topography. In units 324, 327, and 329, conifers up to 30 inches dbh within the footprint would be removed using low ground-pressure rated mechanical equipment or through hand treatment. Meadow unit 320 would have a modified cutting

prescription utilizing variable spacing, as in the adjacent upland thinning, and retaining approximately 20 percent canopy cover of overstory trees based on the current low level of existing understory vegetation. Integrated design features would minimize disturbance to soils and reduce rutting or other damage to the meadow area during treatment. A10-foot mechanical exclusion zone (see IDFs) would apply to the seasonal stream channels within these meadows. Equipment may reach into the exclusion zones. Trees that are needed for bank stability would be identified and retained, regardless of the tree size. Conifers that could not be removed by mechanical means would be hand-felled, and tops and limbs hand-piled for burning where meadow vegetation does not currently exist.

Meadow units 320, 324, 327, and 329 would be underburned. Underburning would take place after mechanical treatment and timed to allow for the break-down of project generated fuels. Underburning would occur in the fall, when meadow grasses are dry enough to allow for burning success. These units may be temporarily rested from livestock grazing to meet vegetation management goals that would enable prescribed burning. Meadow monitoring would be conducted annually to determine if resting each meadow to reach optimum levels of vegetation for burning conditions and/or recovery is needed. If resting a meadow is warranted, fences would be used to temporarily exclude livestock to allow for desired meadow vegetation conditions. Livestock could be excluded for a period anticipated to be at least one growing season prior and two growing seasons following burning.

Springs

Unit 327 has a spring that feeds into the meadow system, and there are areas of unstable drainage in unit 252 (fuels only treatment) and adjacent to the spring. No mechanical treatment would take place within 10 feet of the spring or unstable drainage. Trees up to 10-inches dbh may be felled by hand and removed from this area. Trees needed to maintain the stability of banks around the spring and the unstable drainage would be identified and retained, regardless of tree size. A permanent fence would be placed around the spring to protect the spring from grazing.

Aspen

There are four aspen stands within the Grizzly project area ranging in size from 0.10 acre to 3 acres (units 301, 302, 304, and 305). Mechanized equipment would be used to remove conifers 3.0 inches dbh up to 30 inches dbh from within these stands to a distance of one and one-half tree lengths of the most distal aspen stem, using the tallest conifer occurring within the aspen stand as a measure. Typically, this distance is between 100 and 200 feet away from the most distal aspen stem. All conifers 30 inches dbh and greater would be designated as leave trees, within the limits of safety and operability. Trees 30 inches dbh and larger that are felled for safety and operability would be left on site for wildlife and other resource considerations. Other conifers would be retained as leave trees where they do not directly compromise sunlight availability to aspen stems. Pine trees greater than 24 inches dbh (ponderosa, Jeffrey, western white, sugar pine) would be given priority for retention; however, incense-cedar, red fir, and Douglas-fir greater than 24 inches dbh may also be selected for retention. White fir and lodgepole pine would not be retained unless they are 30 inches dbh and greater. Where leave trees exist in clumps (within approximately 10 feet from each other), the entire clump would be retained. Conifer retention within the stands

would be site-specific and based on the size, health, and availability of leave trees. Additional leave trees would be selected in unit 305 due to the unit's proximity to the Pacific Crest National Scenic Trail and visual quality objectives for the trail. Temporary fencing would be placed to protect new shoots from browsing as needed.

Conifers that cannot be removed by mechanical means would be removed using a follow-up hand-thinning treatment. The fuels generated from hand treatment would be hand-piled and burned or lopped and scattered. Fuels piled for burning would be piled more than 25 feet from the most distal aspen tree or shoot.

There would be no underburning proposed within aspen units. Underburning could damage the limited number of overstory aspen, and these aspen are needed to promote regeneration and to continue to provide habitat for wildlife.

Research Areas

The US Forest Service Pacific Southwest Research Station located in Redding, California, has three proposed research projects included in the Grizzly Restoration project. More information detailing the research is available upon request.

I. Canopy Cover Studies

The canopy cover research plots are proposed and embedded within plantation or natural stand treatment units 20, 25, 30, 48, 50, 124 and 157. These research plots have each been assigned a treatment unit number (units 500 through 502). Treatments would include mechanical mastication of all shrubs (total mastication) and no mastication (control) in the pine plantations. In the true fir and mixed conifer stands, the treatments would be either grapple piling (GP) or tractor piling (TP), with the piles subsequently burned (B). Snags within research plots would be felled, but may be left in place to meet other resource needs.

For each forest type, the study design is set up to have eight possible combinations, to be blocked three times (24 total plots).

- Pine plantations (units numbered 501): The eight factorials among two disturbance methods (mastication and control – no treatment) and four levels of canopy cover would be randomly assigned into each block. Plot size would be 150 feet x 150 feet with about 13 acres in total for the research plots. The inner 100 feet x 100 feet square would be the measurement plot. All possible treatment combinations would be:
    - 15 percent canopy cover + mastication
    - 30 percent canopy cover + mastication
    - 45 percent canopy cover + mastication
    - 60 percent canopy cover + mastication
    - 15 percent canopy cover + control
    - 30 percent canopy cover + control
    - 45 percent canopy cover + control

- 60 percent canopy cover + control

- Mixed-conifer and true fir stands (units numbered 502 and 500, respectively): Fuels would be treated with either grapple piling or tractor piling, with the piles subsequently burned. Therefore, eight factorials among two disturbance methods (grapple-pile plus burn and tractor-pile plus burn) and four levels of canopy cover would be studied in these two forest types. Eight plots would be randomly assigned into each of three blocks. Because these natural stands are tall, plot size would be one-acre (210 feet x 210 feet) and three blocks at each forest type, yielding 24 plots in both forest types. An inner half-acre plot (100 feet x 100 feet) would be the measurement plot. All possible treatment combinations would be:
    - 15 percent canopy cover + GP+B
    - 30 percent canopy cover + GP+B
    - 45 percent canopy cover + GP+B
    - 60 percent canopy cover + GP+B
    - 15 percent canopy cover + TP+B
    - 30 percent canopy cover + TP+B
    - 45 percent canopy cover + TP+B
    - 60 percent canopy cover + TP+B

II. Enhancing health and function of oak-dominant stands through an appropriate stand density mitigation

The oak density research plots are proposed and embedded within natural stands 21 and 24 and have been assigned treatment unit number 503. A complete randomized design would be used to establish four research blocks. Three stand densities of 80, 120, and 160 square feet per acre basal area and control plots would be randomly assigned into each of the blocks. Plot size would be 150 feet x 150 feet with about 8 acres in total for the research plots. The inner 100 feet x 100 feet square for overstory trees would be the measurement plot. The understory vegetation would be measured in the subplots. The thinning prescription would remove trees to meet desired basal area, targeting conifer trees for removal first then thinning oak trees as needed. Oak trees 12 inches dbh and larger and conifer trees 30 inches dbh and larger would be retained. Snags within research plots would be felled, but may be left in place to meet other resource needs.

III. Radial Release of large trees in a mixed-conifer forest: quantifying radius distance to improve vigor

The main objective of this study is to evaluate tree vigor or health responses measured by diameter growth and physiological variables to various radial releases and to determine the effect of neighbor tree species (pine or oaks) on soil quality and subsequent improvements in large trees' health. Forty pine trees with 30 inches dbh or greater would be selected as experimental units to address the first objective. All mid- and understory trees would be removed within a 30 feet radius around 10 pine trees, around 10 pine trees with a radius of dbh (in.) x 12 (e.g., 32 inch dbh would remove all mid and understory trees within a 32 foot radius), around 10 pine trees with a radius of dbh (in.) x 12 x 1.25 (e.g., 32 inch dbh would remove all mid- and understory trees within a 40 foot

radius), and leave 10 pine trees without thinning as control. Snags within research plots would be felled, but may be left in place to meet other resource needs.

To address the second objective, 20 pine trees in the conifer and oak stand would be identified. Thinning would occur around 10 pine trees, but leaving two pines within a radius of dbh (inches) x 12 (e.g., 32 inch dbh would remove all mid and understory trees, but retain two pines within a 32 foot radius), and thinning would occur around 10 pine trees, but leaving the two largest oaks within a radius of dbh (inches) x 12.

Fuels

Area thin vegetation treatments within the project area would use a modified thin from below prescription to vary basal area retention. Area thin treatments would meet the desired fuel conditions for flame length, fire type, and P-Torch, and would contribute to our ability to safely manage prescribed and natural fire and move acres in the project area from a condition class 3 towards condition class 2 and 1. After mechanical treatment, non-merchantable trees in excess of fire and fuels objectives would be hand or mechanically felled and piled, lopped and scattered, or mechanically masticated. Machine or hand piling and burning of downed woody surface fuels and/or underburning may follow thinning. Piling operations would occur where down woody surface fuels 3 inches in diameter or less exceed 5 tons per acre. Surface fuels greater than 3 inches in diameter, but less than 12 inches in diameter would be reduced to 10 to 15 tons per acre. Surface fuels greater than 12 inches diameter and 6 feet or greater in length would not be considered for treatment except where surface fuel loading exceeds 15 tons per acre. Table 7 displays the acres of fuels-only and post thinning fuels treatments proposed.

Table 7. Proposed fuel treatments and post thinning treatment acres

Fuels-Only and Post Thinning Treatment	Acres
Fuels only underburn	91
Post-thinning treatment:	
• Underburn	2,573
• Hand pile, pile burn	170
• Grapple pile, pile burn	497
• Tractor pile, pile burn	71

Underburning

Underburning following implementation is proposed throughout the project area. Specific units from which fire would be excluded or in which only pile burning would take place are identified in the proposed action and integrated design features, and are listed in appendix A (Proposed treatment by unit number). In thinned units,

broadcast underburning would be used to consume preexisting surface fuels and generated slash. Ignitions would occur throughout a unit, with special emphasis given to concentrations of fuels. In mixed conifer forests, this typically yields a mosaic of burned and unburned material. In an effort to retain large logs and stumps for wildlife and hydrology, these features would not be actively lit during prescribed fire operations. Underburning in stands proposed for treatment prior to prescribed fire would have acceptable tree mortality not to exceed 5 percent of standing basal area.

Surface fuel reduction through low-intensity underburning as the only treatment is proposed in nine units: 35, 44, 72, 82, 182, 226, 244, 246, and 252. Fire would be allowed to burn into units 182 and 252 ("back into"), but to protect other sensitive resources, there would be no active ignition within these units. In un-thinned units, prescribed fire would be used to burn pockets of small diameter trees as well as surface fuels. Fire would be ignited throughout a unit, with special emphasis given to lighting concentrations of fuels. Fire would be lit in such a manner that intensities would not affect large overstory trees. These stands where surface fuel reduction through low-intensity underburning as the only treatment would have acceptable tree mortality not to exceed 10 percent of standing basal area.

Transportation

Table 8. Summary of proposed transportation actions.

Action	Miles
New Road Construction (ML 1)	1.1
New Road Construction ML 2 (realign existing road)	3.6
Decommission	4.9
Reconstruct Existing NFS ML3 road (stormproofing/surfacing)	4.7
Reconstruction maintenance of NFS ML2 road	6.4
Add Motorized Trail (existing unauthorized route)	0.2
Temporary Road	1.6

Note: Mileages are approximate and affected by rounding.

The existing forest transportation system would be utilized to provide access to treatment units. Road maintenance would be performed on a portion of that system as needed for project implementation.

Approximately 11.1 miles of road reconstruction would occur within the project area. This reconstruction work would include upgrading culverts, surfacing drainage crossings, clearing encroaching vegetation, constructing drainage dips and low water crossings, and surfacing with crushed aggregate to improve roadway drainage functionality. Approximately 4.7 miles of NFS maintenance level (ML) 3 road would receive storm proofing and aggregate surfacing to protect resources and improve haul efficiency. An additional 6.4 miles of NFS ML 2 road would receive reconstruction maintenance.

Approximately 3.6 miles of NFS ML 2 road within the project area is currently located within RHCAs. New road would be constructed outside of the RHCAs to replace these roads, and the current road location would be decommissioned once the new alignments are completed.

A total of approximately 4.0 miles of existing NFS road would be decommissioned as they are not needed for long-term future management; approximately 0.9 miles of unauthorized routes were determined to have no immediate or long-term future management needs and would be decommissioned to comply with the LNF Motorized Travel Management ROD (2010).

In addition to the existing forest transportation system, approximately 1.1 miles of ML 1 NFS road would be constructed to access treatment units. These new NFS roads would be designed to be out-sloped where possible with self-maintaining drainage structures. ML 1 roads are closed to all motor-vehicle traffic, but retained on the NFS to facilitate future management activities.

Approximately 0.2 miles of existing, unauthorized routes were determined to provide access to multiple dispersed camping locations and would be added to the system as motorized trails to allow continued public access to these sites.

Approximately 1.6 miles of temporary roads may be constructed for access during project implementation. These temporary roads would then be obliterated upon project completion.

A temporary road-stream crossing over Scotts John Creek is proposed to provide access to mechanically treat aspen stands and the adjacent area thin units located along the creek. This temporary road-stream crossing would be removed following implementation of the aspen and area thin treatments on the west side of Scotts John Creek. Any fill material used in construction of the crossing would be removed from the stream channel and adjacent stream banks. Following fill removal, groundcover would be spread on the stream banks at the crossing to attain a minimum of 90 percent groundcover. Materials utilized as groundcover may include slash, woody debris, and/or rock aggregate. The crossing site would be evaluated by a soil scientist and/or hydrologist following crossing removal to determine if further remedial actions are warranted to stabilize the site.

NFS roads and non-paved county roads used for haul would receive pre-, during-, and/or post-haul maintenance as per Forest Service Road Maintenance T-Specifications for Timber Sale Contracts. Maintenance items include surface blading, surfacing, clearing for sight distance, installation of rolling dips, and cleaning drainage facilities. The road maintenance on this project would supplement a forest road maintenance program that is currently under-funded. A dust abatement plan would also be included to control wind-caused erosion from road use. A surface replacement deposit collection would be required based on haul volume on any gravel- or cinder-surfaced NFS road.

Rock Quarry

An area of approximately 10 acres would be excavated to remove the overburden/topsoil and extract rock material. Approximately three acres would be utilized to stockpile the overburden/topsoil and for staging crushed rock material from the quarry. Timber removed during clearing and access road improvement activities would be

limbed and decked for future removal at designated locations in the quarry. Non-merchantable timber and shrubs would be piled and the piles burned. Stumps would be piled and left.

Water Sources

All water sources proposed for use in this project would be brought up to best management practice (BMP) standards. The following are water sources proposed to be used in the Grizzly Restoration Project. They are all fish-bearing streams, and IDFs for water drafting would follow Region 5 BMP 2.5 for fish-bearing streams:

- L-T Creek (T26N R6E, E ½ sec. 19)
- Rock Creek (T26N R6E NE ¼ sec. 7)
- Willow Creek (T26N R5E NE ¼ sec. 12)
- Butte Creek (T26N R4E NW ¼ sec. 22)
- Water Creek (T26N R6E SE ¼ sec. 2)

Integrated Design Features

Integrated design features (IDFs) are elements of the project design that would be applied in treatment areas in addition to current management direction, standards and guidelines. These features are developed to reduce or avoid adverse environmental effects of the proposed action on forest resources. The following IDFs would be applied in conjunction with management actions proposed for the Grizzly Restoration project area:

Silviculture

1. Cut stumps of live conifers with a 14-inch stump diameter would be treated with an EPA-approved borate compound which is registered in California for the prevention of annosus root disease. No EPA-approved borate would be applied within aspen treatment units or within 25 feet of known Sensitive and Special Interest Plants or within 25 feet of live streams and meadow/wetlands.
2. All sugar pine identified as rust resistant or as a candidate for rust resistance would be protected. A $20,000 fine would be imposed for each rust-resistant or candidate tree damaged during operations. Healthy sugar pine showing no observable signs of blister rust would be favorably retained.
3. No felling or skidding operations would be allowed in the true fir forest zone from April 1 through June 30 to reduce damage to true fir stands when sap is flowing and bark is loose.

Watershed

Riparian Habitat Conservation Area Widths

Equipment exclusion zones would be established within Riparian Habitat Conservation Areas (RHCAs) measured from the edge of the stream channel or aquatic feature. Equipment would be permitted to reach beyond mechanical restriction zone boundaries into the RHCA, but not allowed to enter. RHCA widths and mechanical restriction zones would be as follows:

Table 9. RHCA widths and mechanical restriction zones (measured from the edge of the aquatic feature).

Aquatic Feature	RHCA width	Ground-based mechanical equipment restriction zone	
		If slope is 20% or less	If slope is greater than 20%
Perennial stream	300 ft.	50 ft.	150 ft.
Seasonal stream	150 ft.	25 ft.	50 ft.
Lake, wetland, wet meadow	300 ft.	No restriction zone; may work to the edge of the feature	
Meadow units 320, 324, 327, and 329	300 ft.	No restriction zone, equipment may work within the feature	
Fens	300 ft.	150 ft.	
Springs	300 ft.	10 ft.	50 ft.

4. During broadcast burning, no ignitions would be permitted within 150 feet of perennial streams or 50 feet of seasonal streams. However, fire is permitted to back into these areas. This IDF does not pertain to burn piles.
5. Hand-felling within the RHCA, including within the mechanical restriction zone, would be permitted.
6. Riparian species (aspen, cottonwood, alder, willow, dogwood, etc.) would not be removed.
7. Stream bank stability trees would be identified by a qualified specialist prior to RHCA treatments near springs and along Scotts John Creek. Stream bank stability trees would not be felled unless they pose a safety risk, in which case they would be felled and left in place.
8. Turning of equipment within RHCAs would be kept to a minimum.
9. There would be temporary road-stream crossing over Scotts John Creek; otherwise, there would be no crossing of perennial streams by mechanical equipment. Crossings of seasonal and/or intermittent streams would be designated by a qualified specialist prior to implementation. Following use of these specified crossings, a qualified specialist would assess the site for potential repair and/or restoration needed.
10. Skid trails within RHCAs would be kept to a minimum. No waterbars would be installed on skid trails within RHCAs following treatment.
11. Skid trails within RHCAs would require 90 percent ground cover following project implementation.
12. No cut and fill would be allowed for new skid trails within RHCAs.
13. Where mechanical equipment is used to fell timber within RHCAs, one-end suspension would be used to remove felled timber where feasible. If one-end suspension is not feasible, endlining would be permitted as long as objectives for 90 percent groundcover on non-rocky riparian soils are met.
14. Endlining of material would be permitted within RHCAs with slopes greater than 20 percent, but would not be permitted within 25 feet of any continuous scour channels.

15. No piling of material for burning would occur within 25 feet of an aquatic feature. If piles for burning cover more than 10 percent of the RHCA in a unit, only one-third of the piles would be burned in any given year to avoid impacting the nearby riparian environment.
16. There would be no construction of new landings or use of old or existing landings within an RHCA without concurrence by a qualified specialist except implementation of meadow enhancement treatments in units 320, 324, 327, and 329 would require the placement of landings within an RHCA. Landing locations within RHCAs would be approved by a qualified specialist prior to the construction of a new landing or use of an existing landing. Landings would not be placed within 25 feet of the existing riparian or meadow vegetation. Landings within RHCAs would be decommissioned following project implementation and a qualified specialist would evaluate them for compaction or erosion potential. Mitigations may include obliteration of the landing, spreading of native seed, mulch, woody debris, or certified weed-free straw.
17. Existing Forest road 26N11 between the proposed temporary road-stream crossing over Scotts John Creek and Forest road 26N11B may be used for haul to provide access to the proposed new road. Otherwise, no hauling would take place on existing Forest road 26N11.
18. There would be no skidding of material on existing Forest road 26N11.
19. Operations within the meadow footprint of units 320, 324, 327, and 329 would take place when soils are dry to 10 inches.
20. Turning of equipment within the meadow footprint would only occur when backing up cannot take place.
21. Placement of skid trails within the meadow footprint in units 320, 324, 327, and 329 would be kept to the minimum necessary to meet project objectives, and skid trails would be placed on areas of higher ground or rocky soil. No equipment would cross through the swale in unit 324.
22. In meadow units 320, 324, 327, and 329, low ground pressure equipment would pack cut trees back to the designated skid trail in order to minimize impacts from skidding, though large-tire skidders may be used to move oversize trees to the skid trail for skidding to the landing.
23. Soils within meadows would be evaluated by a qualified specialist prior to and during implementation, and additional mitigations could be required or implementation could be halted. Following implementation, skid trails and landings would be evaluated for appropriate remediation, and remediation implemented.

Water Drafting

24. A fisheries biologist would visit all potential water drafting sites within the project area prior to use to determine presence/absence of Cascades or Sierra Nevada yellow-legged frog tadpoles or egg masses. If tadpoles or egg masses are identified at a potential water drafting site, that site would not be used for water drafting.
25. The water drafting rate should not exceed 350 gallons per minute for streamflow greater than or equal to 4.0 cubic feet per second.
26. If streamflow is less than 4.0 cubic feet per second, water drafting rates should not exceed 20 percent of surface flows.
27. Water drafting would cease when bypass surface flows drop below 1.5 cubic feet per second.

Soils

28. Soil quality standards and appropriate best management practices (BMP) that protect forest soils would be implemented for the entire project. BMPs and soil standards are described in Water Quality Management for Forest System Lands in California, Best Management Practices (2011), LNF LRMP (1993), and the 2004 SNFPA ROD.
29. In treatment units outside of RHCAs, soil moisture conditions would be evaluated using Forest-established visual indicators before equipment operation proceeds. LNF Wet Weather Operations and Wet Weather Haul Agreements would be followed to protect the soil and transportation resources.
30. Areal extent of detrimental soil disturbance would not exceed 15 percent of the area dedicated to growing vegetation. Following implementation, the mechanical treatment units would be evaluated by a qualified specialist to determine if detrimentally compacted ground exceeds the LRMP standard of 15 percent areal extent. If restoration is needed to achieve compliance, an appropriate subsoiler, ripper or other implement would be used to fracture the soil in place leaving it loose and friable.
31. In mechanical treatment units, landings within treated areas no longer needed for long-term management would be evaluated by a qualified specialist to determine whether remediation is needed to restore productivity and hydrologic function. If so, appropriate remediation would be implemented. Where landing construction involved cut and fill, the landing would be re-contoured to match the existing topography.
32. Machine piling operations would remove only enough material to accomplish project objectives and would minimize the amount of soil being pushed into burn piles. Duff and litter layers would remain as intact as possible, and the turning of equipment would be minimized.
33. To the extent possible, existing landings and skid trails would be used.
34. Mechanical equipment would not operate on slopes greater than 35 percent.
35. Where it exists, large woody material greater than 20 inches in diameter would be retained at a rate of at least five logs per acre.
36. In units 49 and 69, additional soil displacement would be avoided by limiting equipment turning.

Fuels

37. Hand and machine piles would not be placed in a location that would result in the mortality of surrounding trees when piles are ignited.
38. All burning (underburning, jackpot burning, pile burning) will be completed under an approved Prescribed Burn Plan.
39. Control lines would be constructed for prescribed fire operations (i.e., underburning), except where existing roads, skid trails, trails, or natural barriers would serve as control lines.
40. Control lines would be rehabilitated after prescribed burns have been completed and declared out by the appropriate fire and fuels personnel, unless the control line is to be used in a subsequent prescribed burn.
41. All burning of hand piles will be in compliance with California Ambient Air Quality Standards (CAAQS).

Wildlife

Northern Goshawk:

42. Goshawk PACs would be surveyed prior to treatment. A Northern goshawk limited operating period (LOP) from February 15 to September 15 would be applied within ¼ mile of all goshawk PACs. The LOP would be lifted after surveys if it is determined that lifting the LOP would not affect nesting goshawks.
43. A 500-foot no-treatment buffer would be placed around any new nest found during project implementation and all currently known nest sites where evidence of a nest exists (intact or remnant).
44. If a new active goshawk nest site is found during project implementation or within a treatment unit, a new PAC would be created to encompass the best available habitat around the nest location. The marking prescription within the newly defined territory would be adjusted to attain suitable nesting habitat within two decades.
45. For treatments occurring within new goshawk PACs, landings would be placed outside the PAC wherever feasible.

Spotted Owls:

46. A spotted owl LOP from March 1st to August 15th would apply to stands within ¼ mile from a spotted owl PAC. The LOP would be lifted after surveys if it is determined that lifting the LOP would not affect nesting owls.
47. If a California spotted owl nest is found within any of the proposed treatment units, the nest would be protected through the placement of a new PAC or the realignment of an existing PAC boundary.
48. A 500-foot no treatment buffer would be placed around any new nest found during project implementation and all currently known nest sites where evidence of a nest exists (intact or remnant).
49. No treatment would occur within existing or new spotted owl PACs.

Marten:

50. If a marten den site is identified, a 100-acre buffer consisting of the highest quality habitat in a compact arrangement would be placed around the den site. A marten LOP from May 1 through July 31 would be placed around marten den sites as long as habitat remains suitable or until another Regionally-approved management strategy is implemented.
51. Units 2, 26, 31, 52, and 88 include features which monitoring has shown are frequently used as female marten rest sites, though den sites have not been confirmed. Treatment in these units would be timed to take place before May 1st and after July 31st to avoid possibility of affecting marten denning.

Snags and Down Logs:

52. Snags and live trees with existing wildlife use would be retained first regardless of stage, size, or species. Examples of wildlife use include large stick nests, large or small cavities, or woodpecker excavations. Where they exist, the priority for snag retention would be the largest conifer snags of pine species (sugar pine, Jeffery pine/ ponderosa pine, Western white pine), followed by Douglas-fir and true fir species (red fir and white fir).

53. During prescribed burning operations, snags larger than 15 inches dbh, stumps greater than 24 inches in diameter, and down logs a minimum of 12 inches in diameter and 6 feet in length would not be actively ignited.

Aspen and Oak:

54. All aspen and oak trees greater than 8 inches dbh would be protected during operations within the limits of safety and operability, except where oak may be a component of proposed studies within the research plots.
55. Landings would be placed outside of aspen and oak stands if possible.

Shrubs:

56. A LOP from May 1st to August 15th for migratory song birds nesting within shrubs would be applied to proposed mastication of shrubs in units 28, 66, 71, and 146.
57. Where proposed treatment includes the mastication of shrubs, except within the proposed research plots, approximately 15 percent of the existing shrub cover would be retained. Mastication of shrubs within proposed research plots would follow the research study design.

Heritage

Federal laws, regulations and programmatic agreements between the Forest Service and the Office of Historic Preservation for the protection of cultural resources would be followed. Historic properties within the Grizzly Restoration project area of potential effect (APE) would be protected during project implementation utilizing the following measures:

58. Cultural resource sites eligible for listing on the National Register of Historic Places (NRHP) or potentially eligible properties located within or adjacent to treatment areas, activity areas (i.e., landings, water sources etc.) or access roads would have their boundaries flagged and tagged as non-entry zones for all project activities. No ground disturbing project-related activities would occur within site boundaries.
59. Cultural resource sites eligible or potentially eligible for the NRHP located within the project APE but not in close proximity to identified treatment areas would be protected from indirect project impacts such as use of sites for staging equipment or vehicles (i.e., timber harvest equipment; water trucks; road construction, reconstruction or maintenance equipment; Forest Service vehicles etc.) or any other activities. The Forest Service project manager would be apprised of all site locations to insure protection from direct as well as indirect effects; permanent tags would define the site boundary.
60. Linear sites such as historic roads, ditches and prehistoric quarries may be crossed on a limited basis in previously disturbed areas. All crossings would be made perpendicular to the site, and the site would be returned to its original design at project completion. All crossings would be designated by heritage personnel.
61. Hauling on main system roads that bisect archaeological sites would continue. Vehicles and equipment using these roads would stay on the road prism in areas that bisect heritage sites. New road construction, reconstruction, or modification of the existing prism within site boundaries would not occur without additional review and/or consultation.

62. Forest system spur roads and non-system roads that bisect archaeological sites would not be used except under the following circumstances: road redesigned to exclude historic properties; heritage properties have been evaluated and determined ineligible for the NHRP or protective material is placed on roadbed in sufficient quantity to protect surface of site from disturbance.
63. Ground disturbing activities associated with decommissioning of Forest system roads or non-system roads that bisect historic properties would not take place within the boundary of these sites without concurrence from a qualified specialist.
64. The project manager or sale administrator would walk historic property boundaries located within or near activity areas with operators before project implementation to insure protection.
65. Historic properties within or adjacent to planned treatment areas, activity areas, or roads would be monitored during and after project completion.
66. If heritage resources are identified during project implementation (unanticipated discovery) all work would cease immediately in that area until the situation is reviewed and an assessment and mitigation plan instituted to insure protection of the site.

Range

67. During project implementation, coordination with the District Rangeland Specialist and the allotment permittee would occur to avoid conflict with livestock operations. If vegetation treatments require temporary livestock exclusion to meet management goals for prescribed burning, the activities would be staggered so that the three meadow areas would not be excluded from grazing at the same time (i.e., fenced, burned, and rested). Temporary fencing would consider water availability and trailing needs.
68. The key areas on active allotments will continue to be monitored to ensure standards and guidelines are being met. If post-treatment protection measures are needed (i.e. fencing to reduce browsing or access to sensitive area), livestock mitigation measures would be developed in coordination with the range permittee. Additional measures could include controlling distribution of livestock through placing supplements away from treated areas, moving livestock to another area, or other protection methods.

Botany

Threatened, Endangered, and Sensitive (TES) Plant Species

69. There are six occurrences of *Silene occidentalis* ssp. *longistipitata* (LNF #6A, #6B, #6C, #6D, #6E, #6F) within unit 49. Occurrences #6B and #6F would be flagged and avoided by all project activities. Occurrences #6A and #6E would be flagged and avoided by mechanical equipment; however, underburning would be permitted within these occurrences. Mechanical equipment would be allowed within occurrences #6C and #6D; however, piles and skid trails would be placed outside of occurrences. Underburning would be permitted to occur through either #6C or #6D, but not both.
70. Underburning within *Silene occidentalis* ssp. *longistipitata* occurrences as described above would occur only in the fall.

71. The occurrence of *Botrychium minganense* (LNF #14) within unit 081 would be protected through flag-and-avoid methods and would exclude project activities within 10 feet of this occurrence. Trees would be directionally felled away from this occurrence. No incense-cedar would be removed within the RHCA associated with the spring feature.

72. The occurrence of *Botrychium simplex* (LNF #14) in unit 136 along Forest road 26N11 would be flagged and avoided by all project activities, including any road blading or activities associated with the decommissioning of Forest road 26N11.

73. The occurrence of *Carex davyi* (LNF #2) falls within four units (2, 121, 182, and 327). Mechanical equipment would be excluded from this occurrence. Hand-thinned trees would be directionally felled away from plants. Piles would not be placed within this occurrence. During broadcast burning, no ignitions would be permitted within this occurrence; however fire would be permitted to back into this occurrence.

74. New occurrences of TES plant species discovered before or during ground-disturbing activities would be protected through flag and avoid methods or measures similar to those described above.

Noxious Weeds

75. All off-road equipment would be weed-free prior to entering the Forest. Staging of equipment would be done in weed free areas.

76. Known noxious weed infestations would be identified, flagged where possible, and mapped for this project. Locations would be displayed on contract maps. Identified noxious weed sites within or adjacent to the project area containing isolated patches with small plant numbers would be treated (hand pulled or dug) by forest botany staff prior to project implementation. Any larger or unpullable infestations would be avoided by harvesting equipment to prevent spreading weeds within the project.

77. New small infestations identified during project implementation would be evaluated and treated according to the species present and project constraints and avoided by project activities. If larger infestations are identified after implementation, they would be isolated and avoided by equipment, or equipment used would be washed after leaving the infested area and before entering an uninfested area.

78. Post project monitoring for implementation and effectiveness of weed treatments and control of new infestations would be conducted as soon as possible and for a period of multiple years after completion of the project.

79. If project implementation calls for mulches or fill, they would be certified weed-free. Seed mixes used for revegetation of disturbed sites would consist of locally-adapted native plant materials to the extent practicable.

Recreation/Special Uses

80. Roads accessing campgrounds, trailheads, and trails would be kept open and free of debris.

81. Seasonal restrictions are in place for winter recreation (cross-country ski, snowmobile) from December 26 through April 1 annually for Plumas County roads 307, 308, and 309, and National Forest System roads 27N05, 27N65, and 26N27.
82. Trail tread would be protected on all system trails. Trail crossings for operations would be agreed to in advance, and trail crossings of the Pacific Crest National Scenic Trail (PCT) would be held to a minimum. Trail tread affected by project implementation would be repaired to as good or better condition than prior to operations. Operations-created slash within 100 feet of system trails would be piled for burning.
83. Cut tree marking would be applied within 150 feet of the Pacific Crest National Scenic Trail (PCT) where practical. When leave tree mark is necessary, the mark would face away from the trail. Trees would be directionally felled so as not to fall into the trail.
84. There would be no change or modification to treatment activities in the units through which the Pacific Crest National Scenic Trail (PCT) passes; however, the trail would be considered in sale layout to contribute to the Visual Quality Objection (VQO) of partial retention and to discourage future unauthorized access by motorized users. A maximum stump height of 8 inches would be required within 50 feet of the PCT.
85. Within 50 feet of each side of the PCT, visual disturbance would be limited by entering to harvest trees in a line straight toward the trail and backing out along the same path, minimizing turning of equipment.
86. Timber would be removed within the same operating season as it is cut.
87. Post-implementation fuels treatment prescribed fire would be permitted to burn into and across the PCT. There would be no widening of the trail to implement burning. Trail tread affected by post-implementation prescribed fire would be repaired to as good or better condition than prior to operations.
88. Where prescribed fire enters or crosses the PCT, there would be additional monitoring for danger trees for a period of three years. Identified danger trees would be felled away from the trail and left in place.
89. The Almanor Ranger District would work with the Pacific Crest Trail Association to establish photo points to monitor effects to the trail. Photos would be taken prior to treatment and each year for five years following treatment as needed to record effects to the trail. Interpretive signs may be placed to describe management actions along the PCT.

Decision to be Made

The decision to be made is whether to implement this project as proposed, as modified to address any relevant issues raised during scoping, or not at all. This proposal will be subject to the pre-decisional objection process found at 36 CFR 218. Under this collaborative process, public concerns can be addressed before a decision is made, increasing the likelihood of resolving any concerns and making more informed decisions.

The decision would also determine whether or not to allow a non-significant Forest Plan amendment for deviation from the Riparian/Fish prescription standards and guidelines for limited use of designated skid trails within the RHCAs to facilitate removal of conifers in aspen release units, meadow enhancement units, and area thin units.