Mount Pinos Forest Health Project Proposal

Introduction

The Los Padres National Forest proposes to implement a Forest Health project in the Mount Pinos area on the Mount Pinos Ranger District. The project area encompasses approximately 1,682 acres on the eastside shoulder of Mount Pinos between the Cuddy and Lockwood Valleys. The project area is located in both Ventura and Kern Counties, California (figure 1). The Mount Pinos Forest Health Project area lies within an Insect and Disease Treatment Designation Area[1] where declining forest health conditions put the area at risk for substantial tree mortality. The purpose of this project is to reduce existing stand densities and alter stand structure and species composition to create landscapes more resilient to impacts of drought, insects, and disease.[2]

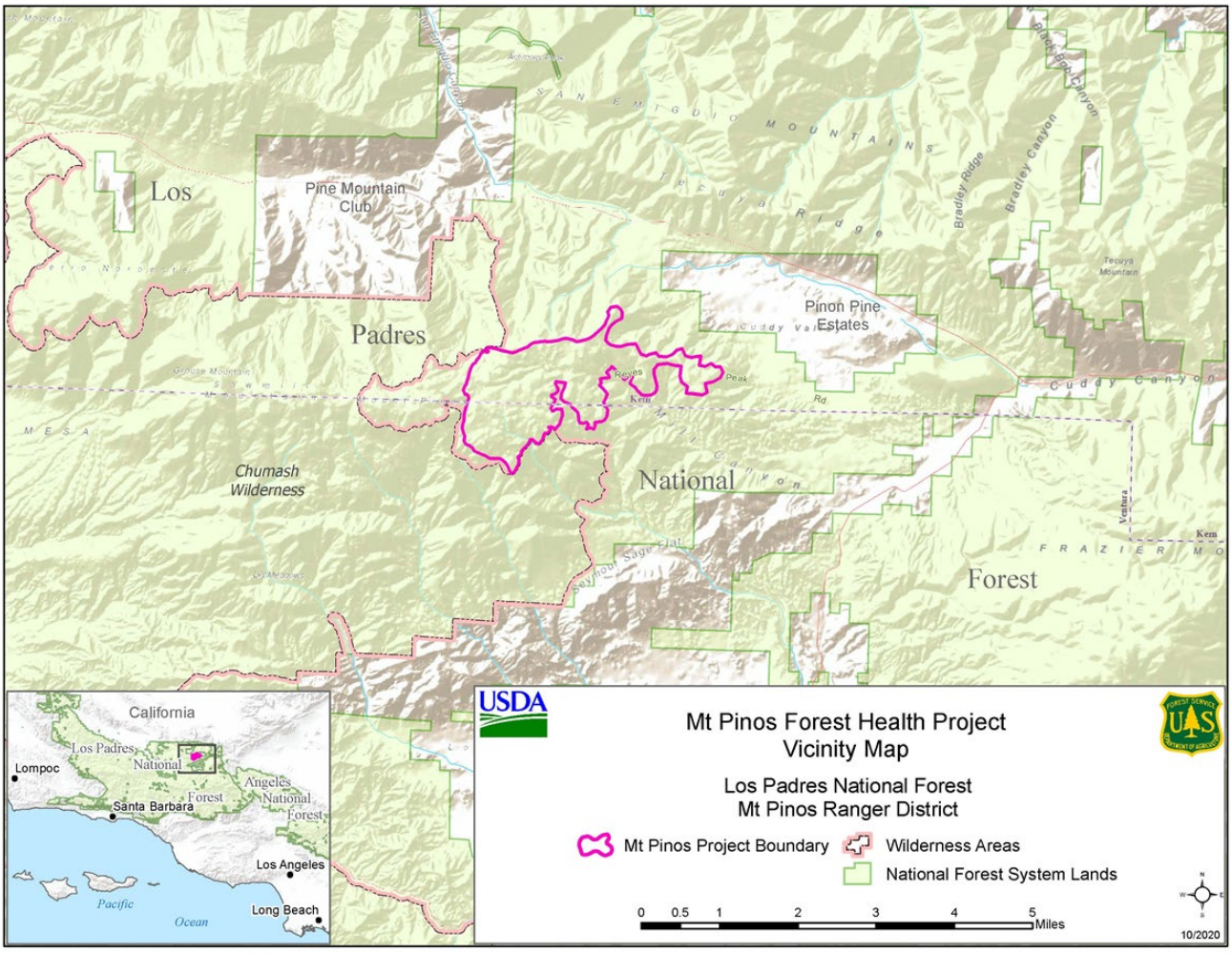


Figure 1. Mount Pinos Forest Health Project vicinity map

This project would improve forest health by reducing existing stand densities and the risk of tree mortality through the removal or on-site treatment of small-diameter, less than 24-inch and dead trees from overstocked stands. Treatments would consist of either mechanical and/or manual thinning methods.

[1] https://www.fs.usda.gov/managing-land/farm-bill/area-designations

[2]References are available at: www.fs.usda.gov/main/lpnf/landmanagement/planning or are on file at the Mt. Pinos Ranger District in Frazier Park, California.

Prescribed fire and pile burning would be used as needed. The proposed treatments would also benefit fire and fuels management by reducing surface, ladder, and crown fuels. High tree density levels, overlapping tree crowns, and a dense understory contribute to resource competition, leaving trees at risk from drought, insects and disease, and wildfire. Treating these areas will reduce competition, improve the health of the remaining trees, and increase the average stand diameter.

The project, located in proximity to Cuddy Valley, extends to the upper slopes of Mount Pinos. The project area is approximately 1.5 miles southwest of the community of Pinon Pine Estates and approximately 2 miles southeast of the community of Pine Mountain Club. The legal description for the project area is T8N, R21W, Sections 3, 4, 5, 8, 9 and T9N, R21W, Sections 26, 33, 34, 35, 36 San Bernardino Meridian; Kern and Ventura County, California (Figure 2).

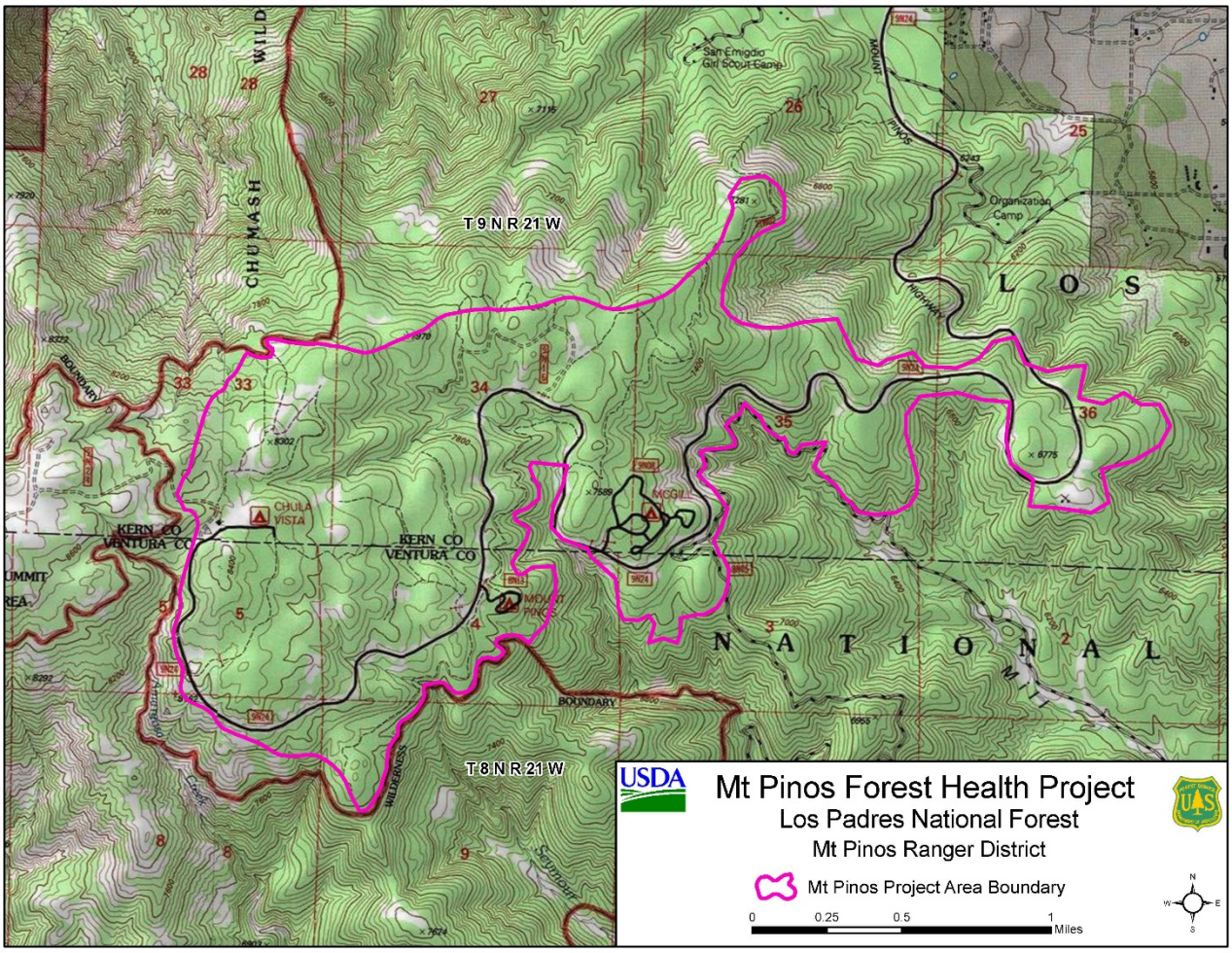


Figure 2. Mount Pinos Forest Health Project area

The project area lies within a designated Insect and Disease Treatment Area where declining forest health conditions put the area at risk for substantial tree mortality over the next 15 years. In the 2014 Farm Bill, Congress authorized the United States Department of Agriculture (USDA 2003, amended 2018) Forest Service to prioritize work in these designated areas, and to expeditiously plan and implement those projects. The Farm Bill also specified that certain projects within insect and disease infested areas would be categorically excluded from the requirements of the National Environmental Policy Act (NEPA). The law specified that these categorical exclusion projects are exempt from the pre-decisional administrative review objections process, and to be considered the project must fall within the wildland-urban interface; or Condition Classes 2 or 3 in Fire Regime Groups I, II, or III, outside the wildland urban interface. This

project falls within the areas to be considered as defined by the Healthy Forest Restoration Act (USDA 2003, as amended 2018).

The Healthy Forest Restoration Act authority (USDA 2003, as amended 2018) would be used for this project. The purposes of the act relevant to this project include actions to:

- reduce risk or extent of, or increase the resilience to, insect or disease infestation;
- enhance efforts to protect watersheds and address threats to forest and rangeland health, including catastrophic wildfire, across the landscape;
- reduce wildfire risk to communities, municipal water supplies, and other at-risk Federal land through a collaborative process of planning, prioritizing, and implementing hazardous fuel reduction projects;
- protect California spotted owl habitat (Forest Service Sensitive Species) to the north of the treated area from the effects of catastrophic wildfire.

Figure 3 shows the vegetation within a 1,500-foot buffer around the project area in relation to wildlife habitat (California Spotted Owl), created by a wildlife suitability model (Zeiner et al. 1998 and 1990).

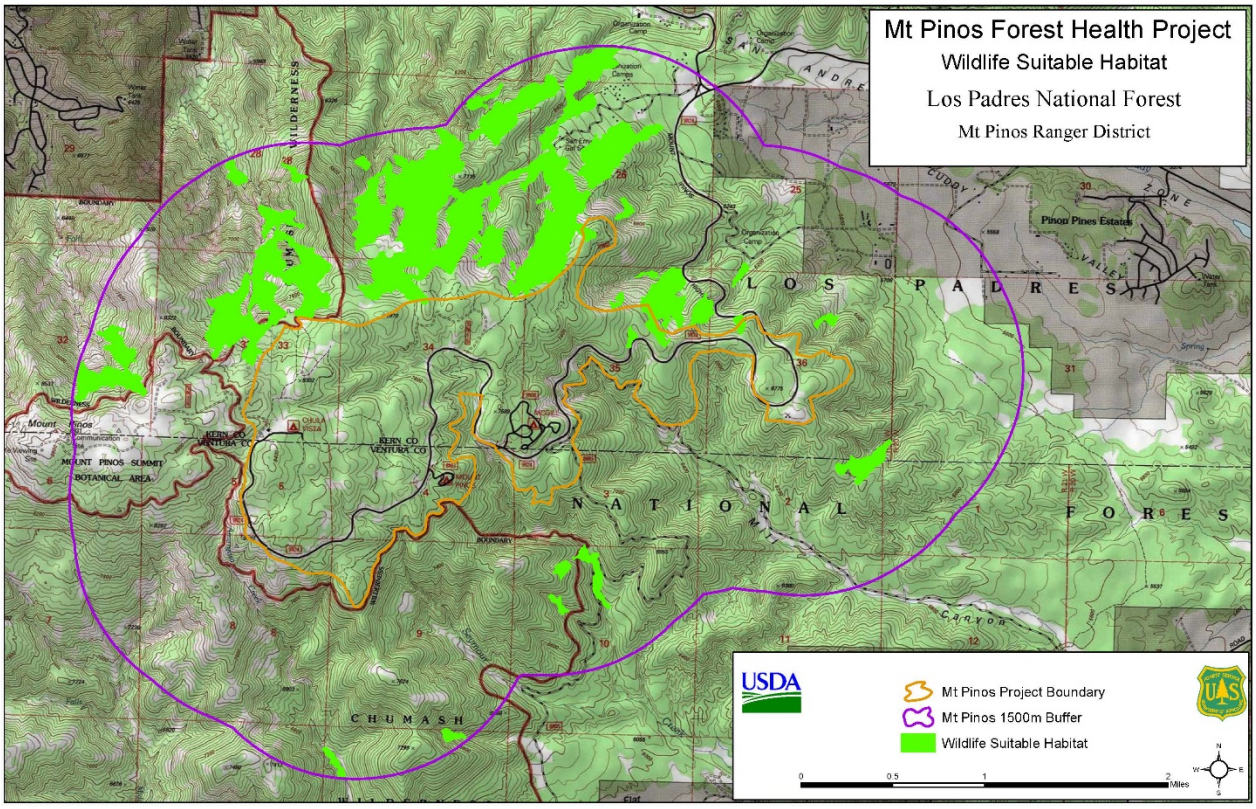


Figure 3. Wildlife suitability habitat map for the Mount Pinos Project

Existing Condition (Affected Environment) and Desired Conditions

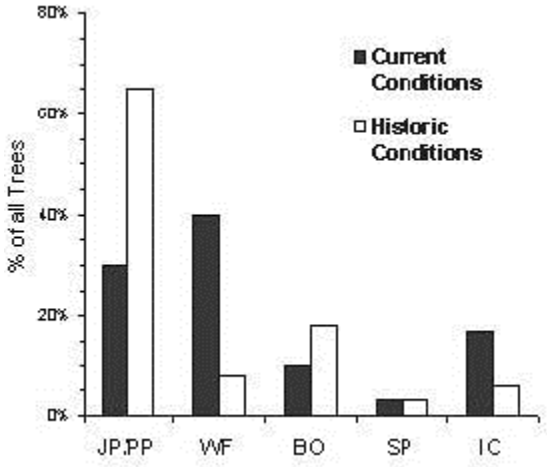
Existing Conditions

Vegetation

A century of fire suppression, logging and grazing has influenced the present condition of vegetation in the Los Padres National Forest (Nigro and Molinari, 2019). As a result, many conifer forests now have tree densities that are much higher than pre-settlement levels (LMP Part 1 pages, 13, 21, 23; Taylor, 2007; Goforth and Minnich 2008). Additionally, species composition is trending away from shade-intolerant species, such as Jeffrey and ponderosa pine toward shade-tolerant species, such as white fir and incense cedar when compared to historic abundances. (USDA 2005, LMP Part 1).

Densification has been occurring in southern California (Minnich et al, 1995; Taylor, 2007; Goforth and Minnich 2008) since the suppression of fire began at least 100 years ago. Adult tree density and basal area in the San Bernardino Mountains were nearly double that of the Sierra San Pedro Martir[3]. Because of this densification, exacerbated by drought conditions, there were three times as many standing dead Jeffrey pine and white fir in southern California as in Baja California. As a result of previous management actions, most trees in southern California established in the last 100 years; the maximum age of Jeffrey pine was around 285 years in southern California, whereas the oldest Jeffrey pine tree in the Sierra San Pedro was 448 years old (Gucker, FEIS report, 2007).

Figure 4 (LMP Part 1 page 24) is an example of a representation of shade-intolerant Jeffrey and ponderosa pines. It illustrates the past versus the present conditions throughout its range. The current conditions in the project area are consistent with this trend of a higher percentage of the shade-tolerant white fir in present-day forests.



Note: JP and PP = Jeffrey pine and ponderosa pine; WF = white fir; BO = black oak; SP = sugar pine, and IC = incense cedar

Figure 4. Historic and current percentages of tree species in western mixed conifer forests

[3] The San Pedro Martir area of northern Baja, Mexico, has received minimal management activities unlike southern California and is used as a reference condition.

Site reconnaissance of the project area showed a patchy, mosaic stand structure with some of the project area already similar to historic conditions with respect to desired stand density and structure. During project implementation, these areas would receive minimal or no treatment to the existing overstory trees (Figure 5).

Figure 5. Example of area already at desired structure needing little or no overstory treatment

However, approximately thirty eight percent[4] of the project area is in excess of what was present historically (Minnich et al. 1995) due to densification (Figure 6). Overcrowding has accelerated and aggravated drought-caused mortality, making conifer forests susceptible to widespread insect and disease outbreaks that, combined with excessive fuel loading, has the potential for more large-scale mortality as a result of insects and disease, drought, and stand-replacing wildland fires.

[4] Derived from stand exam data collected in the project area.

Figure 6. Example of area needing treatment due to densification

Stand exams taken in the project area coupled with walk-throughs by certified silviculturists and other Forest professionals[5] confirm that existing stand density and structure put the area at risk from insects and disease as well as from wildfire. Historically, mixed conifer stands in southern California had approximately 93 trees greater than 4 inches DBH per acre (Minnich et al. 1995). Stand exam data show the project area averages 145 trees per acre greater than 4 inches DBH in mixed conifer stands, exceeding the historic level.

Figure 7 is a good representation of forest densification at the Mt. Pinos snow play area that is within the project area. High stocking levels, overlapping tree crowns, and a dense understory contribute to competition that leaves trees and especially large trees more susceptible to bark beetle attacks (Fettig et al, 2012; Bennet et al, 2015; Bradford and Bell, 2017). The existing understory, close tree crowns, understory ladder and downed fuels and continued periods of drought also place the area at risk for wildfire.

The existing conditions of the timbered stands do not meet the goals and desired conditions of the Los Padres National Forest Plan. Specifically, the existing conditions do not meet Forest Plan Goal 1.2: Restoration of Forest Health, Goal 1.1: Community Protection, with Forest Plan desired conditions for FH 2: Restoration of Forest Health and FH 4: Insect and Disease Management, and finally, National Strategic Plan Goal 1 – Reduce the risk from catastrophic wildland fire.

[5] Mount Pinos Community Wildfire Protection Plan, National Insect and Disease Forest Risk Assessment, Strategic Fuelbreak Assessment, and the 2014 Farm Bill.

Figure 7. Mount Pinos snow play area showing dramatic increase in density of trees, 2020 and 1963

The project area has approximately 1,543 acres of Jeffrey pine, mixed conifer, and pinyon-juniper dominated stands. These stands are experiencing elevated levels of bark beetle activity and associated increasing tree mortality, which has been exacerbated by the ongoing drought. The primary bark beetles involved are pinyon ips (*Ips confusus*) and California fivespined ips (*Ips paraconfusus*). The project area was identified in the National Insect and Disease Forest Risk Assessment of 2012 (NIDFRA) as being at risk from these species of beetles.[6] According to the risk rating models used by NIDFRA, the areas proposed for treatment in this project are categorized as "high risk" for pests that could destroy over 25 percent of basal area[7] due to current forest conditions.

Wildfire and Fuels

Fire has played an integral part in defining and shaping vegetation patterns and composition in California for millions of years, by both natural, and more recently, human-caused ignitions (van Wagtendonk et al. 2018). Frequent, low- to moderate-severity fire in mixed conifer and yellow pine forests played an integral role in maintaining these ecosystems historically. Fire suppression starting in the early 20th century has led to altered fire regimes that affect forest composition, structure, and risk of vegetation type conversion following disturbance. Southern California conifer forests have burned infrequently since the early 1900s, resulting in large and homogenous areas of stand-replacing burns, likely exacerbated even further by recent fire-conducive weather conditions and extended droughts. Recovery from large, high-severity burns is likely to be impeded by the small and disparate nature of mixed conifer forests and limited seed dispersal capabilities of remaining trees (Nigro and Molinari 2019).

The long-term goal of vegetation management is to perpetuate plant communities by maintaining or re-introducing fire regimes appropriate to each type, while at the same time protecting human communities from destructive wildland fires (USDA Forest Service 2005). In the long term, the desired condition for the national forest land would be to: (1) create forests more resistant to the effects of drought, insect and disease outbreaks, and stand-killing crown fires; (2) encourage tree recruitment that contains a species mix more like pre-settlement composition (with a higher representation of shade-intolerant species such as ponderosa pine that have declined during the period of fire suppression); (3) re-create stand densities more like those of the pre-suppression era; and (4) encourage a stand structure that emphasizes large-diameter[8] trees.

Thinning to remove ladder fuels and reduce canopy cover is generally recommended to minimize crown fire hazard (J. H. Scott and Reinhardt 2001). The reduction in crown fire potential provides for increased success of fire suppression and reduces the risk to firefighters and the public in a suppression action. The decrease in crown fire potential also allows fire managers to use more tools in suppression efforts.

The project area is located within the wildland-urban interface and Scott et al (2001) noted thinning to remove ladder fuels and reduce canopy cover is generally recommended to minimize crown fire hazard. A decrease in crown fire potential generally shows increased success in fires suppression efforts and reduces risk to firefighters and the public. It also gives fire managers more flexibility during wildfire suppression operations.

[6] At-risk data from pinyon ips and California fivespined ips.
[7] Used to describe the average amount of an area (usually an acre) occupied by tree stems. It is defined as the total cross-sectional area of all stems in a stand measured at breast height and expressed as per unit of land area (typically square feet per acre).
[8] Large trees are defined by the Forest Plan as those larger than 24 inches diameter at breast height. Small trees are those less than 24 inches diameter at breast height. LMP Part 2, states: Implement vegetation management activities to reduce tree densities and fuel loading in yellow pine and mixed conifer forests to levels similar to those that characterized forests of the pre-suppression and early suppression eras (ca. 1880–1930). Restore species composition comparable to forests of the same era with an emphasis on increasing the relative abundance of large-diameter (greater than 24 inches diameter breast height) shade-intolerant conifer species. LMP, Part 2 Pg. 117.

Potential Fire Behavior

Flame length is an important measure of fire behavior because it is an observable characteristic that can be directly related to fireline intensity[9] (Agee 1996; Andrews and Rothermel 1982), which in turn influences crown fire initiation[10] (Agee 1996). When fireline intensity is too intense and flame lengths are too high to utilize direct wildfire suppression tactics, equipment such as bulldozers and aircraft are used.

Preliminary fire behavior modeling was done for the Mount Pinos Project area and the outputs show that under dry conditions, seventy-two (72) percent of the project area has flame lengths that would make direct fire suppression strategies ineffective and unsafe for firefighters. Conditions like these could initiate crown fire.

Fire History

There have been seventy-one fires within two miles of the project boundary[11] and a number of larger fires, over 200 acres, in the vicinity as shown in Table 1 and Figure 8. Most of the fires were caused by lightning (59). The remaining were caused by equipment use, smoking, campfires, arson, debris burning and miscellaneous or undetermined causes.

Table 1. Wildfires greater than 200 acres near the project area from 1999-Present

Fire Name	Year	Acres
Arco	2006	698
Day	2006	161816
Digier	1999	650
Gorman	2005	2516
Grand	2013	4345
Grapevine-08	2008	527
Ikea	2011	667
Post	2010	1311
Rancho	2013	712
Schallock	2003	564
Scott	2006	751
Tejon	1999	286
Tejon	2003	1199
Water	2013	613
Westside	2006	4025

[9] The rate of energy or heat release per unit length of fire front, regardless of its depth (Byram 1959).
[10] Crown fire initiation and vertical spread occur when fire intensity attains a critical value that is a function of crown base height (VanWagner 1977).
[11] Data obtained from local fire records for time period 1972-2019. The USDA Forest Service uses the most current and complete data available. Data and product accuracy may vary and rounding errors/discrepancies may occur. The Forest Service reserves the right to correct update, modify, or replace GIS products without notification.

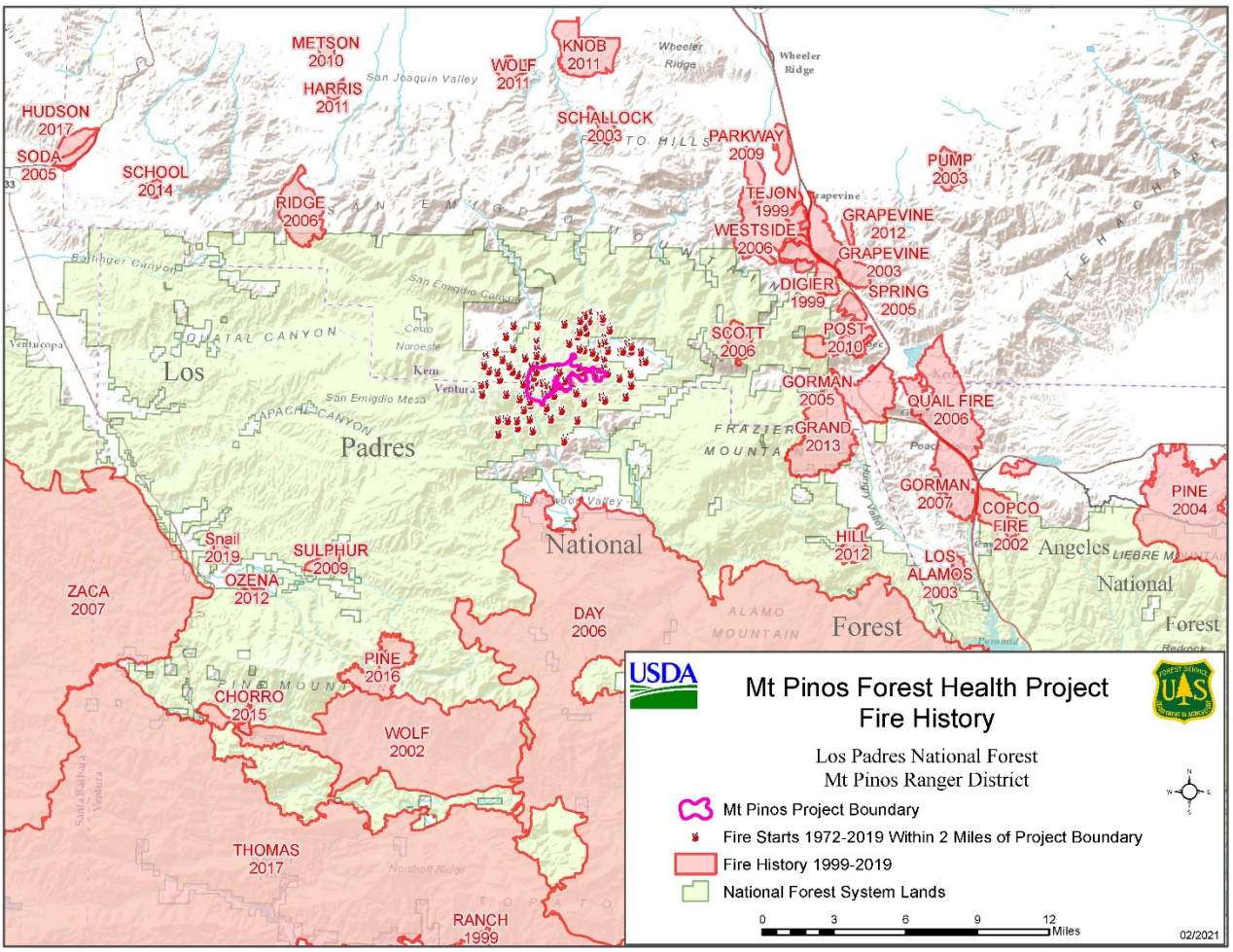


Figure 8. Fire history of the Mt Pinos area

Desired Conditions

The long-term goal of vegetation management is to perpetuate plant communities by maintaining or re-introducing fire regimes appropriate to each type, while at the same time protecting human communities from destructive wildland fires (USDA Forest Service 2005). In the long term, the desired condition for the national forest land would be to:

1) create forests more resistant to the effects of drought, insect and disease outbreaks, and stand-killing crown fires;

2) encourage tree recruitment that contain a species mix more like pre-settlement composition (with a higher representation of shade-intolerant species such as ponderosa pine that have declined during the period of fire suppression);

3) recreate stand densities more like those of the pre-suppression era; and

4) encourage a stand structure that emphasizes large-diameter trees.

Land Management Plan Direction

The Los Padres National Forest Land Management Plan (Forest Plan) consists of three parts: (1) Southern California National Forests Vision (USDA 2005), (2) Los Padres National Forest Strategy (USDA 2005), and (3) Design Criteria for the Southern California National Forests (USDA 2005).

The Mount Pinos Forest Health Project is consistent with the Southern California Forests Vision (Part 1), the Los Padres National Forest Strategy (Part 2) and the Design Criteria for the Southern California National Forests (Part 3).

The Southern California National Forests Vision (USDA 2005) includes the following goals that state, in part:

- Goal 1.1 - Community Protection (USDA 2005, p. 20). Improve the ability of southern California communities to limit loss of life and property and recover from the high intensity wildland fires that are a natural part of this state's ecosystem.
- Goal 1.2 - Restoration of Forest Health (USDA 2005, p. 21). Restore forest health where alteration of natural fire regimes has put human and natural resource values at risk.

The project falls entirely within the Mt. Pinos Place as described in the Los Padres National Forest Strategy USDA 2005, Part 2) and the program emphasis includes in part:

- "focus on perpetuating healthy conifer forests"
- "Jeffrey pine forests would be maintained with vegetative treatments that reduce stand densification problems"
- "emphasize active management of vegetation to maintain healthy conifer stands and protect communities"

The Los Padres National Forest Strategy also outlines program strategies and tactics (USDA 2005, Appendix B). These strategies and tactics for the restoration of forest health include:

- Implement vegetation management activities to reduce tree densities and fuel loading in yellow pine and mixed conifer forests to levels similar to those that characterized forest of the pre-suppression and early suppression eras (ca. 1880 to 1930). Restore species composition comparable to forests of the same era with an emphasis on increasing the relative abundance of large-diameter (greater than 24 inches diameter at breast height) shade-intolerant conifer species.
- Thin conifer stands to prevent water stress and damage by bark beetles.

Purpose and Need

The purpose of the project is to continue efforts to reduce the mortality caused by bark beetles and drought in the Mount Pinos place of the Los Padres National Forest. The insect infestation has been occurring for approximately 15 years. Since 2007, bark beetle mortality, exacerbated by drought, in Jeffrey and pinyon pines has been increasing. Small pockets of dead trees have been observed throughout the project area. Based on the amount of dead and dying trees detected in the project area and the continued drought conditions,[12] high levels of mortality are likely into the future.

Treatments that reduce tree stocking levels or stand densities below this threshold significantly reduce risk of beetle attack and potentially high mortality if bark beetles invade treated stands. Prevention is not guaranteed but improves chances that bark beetles will bypass treated stands in search of more preferable conditions.

- There is a need to maintain or improve resilient forest conditions, which is the capacity of an area to return to prior conditions and function after disturbance (USDA 2011). Resilient forests are those that

[12] The current U.S. Drought Monitor for California (02/16/2021) indicates Abnormally Dry to Moderate drought conditions for the area.

not only accommodate gradual changes related to climate but tend to return toward a prior condition after disturbance, either naturally or with management assistance (Millar et al. 2007).

- There is a need to reduce the stocking levels and competing vegetation to more closely resemble historic levels to improve resilience of these stands to insect and drought-related mortality.
- There is a need to strategically place forest health treatments that are cost effective and complement planned and completed treatments on adjacent private lands.
- There is a need to reduce surface and ladder fuels to make the stands more resilient to wildfire. Higher quantities of surface fuels, trees that are dead and dying due to insect and disease, and natural forest succession make stand-replacing fire an ongoing risk to the landscape.
- There is a need to reduce the heavy continuous fuels between the mountain communities as identified within the Mount Pinos Community Wildfire Protection Plan (2006).

Proposed Action

A reduction in stand density, competing vegetation, and fuel loading levels is being proposed on approximately 1,682 acres of National Forest System lands within the Mount Pinos Place Management Area. Sixty percent of the project area is identified in the Mount Pinos Community Wildfire Protection Plan (CWPP).[13] Additional acres were added to the analysis from the CWPP as during project preparation additional acres were identified in need of treatment. This proposed action is a direct result from ongoing collaboration efforts starting with the Mount Pinos Fire Safe Council in 2006. The McGill-Mount Pinos Project was a direct result of this collaborative effort. The Forest Service held one public meeting and one field trip to the project area. Comments received from the public and participants guided the development of this Mount Pinos Forest Health Project proposed action.

Similar to the proposal within the CWPP, timbered stands would be thinned to a range of 60 to 100 basal area per acre, with a target of 80 basal area per acre. The reduction to this level would promote forest health. All diameter size classes of trees would be removed up to 24 inches diameter breast height, which is smaller than the original CWPP proposal of 30 inches diameter breast height. Residual trees would be selected for vigor and larger Jeffrey pine trees would be retained as per Forest Plan direction unless they are determined to be a hazard tree per Pacific Southwest Region Danger Tree Guidelines. All black oak would remain on-site, unless they are deemed a hazard tree. Jeffery pines would be the preferred trees to leave and white fir and pinyon pine would be the preferred trees to be removed. Timbered stands with slopes generally greater than 35 percent would be thinned by hand. Activity fuels would be either lopped and scattered or hand-piled, depending on conditions and to meet fuels management objectives.

A combination of mechanical thinning, mastication of brush and smaller trees, and manual hand treatments would be used. The manual hand treatments would include thinning using chainsaws, brush cutting, pruning, and hand piling of material. Disposal of residual woody material would be done through pile burning or under burning. All treatments would reduce the tree density and fuel loads in selected stands and change the structure of live and dead material in treated stands. In some mechanically treated areas, material may be removed from the site. In areas that receive mastication or manual thinning hand methods as the primary treatment, some material would be left on site.

[13] Named the McGill-Mount Pinos Project in Mount Pinos Community Wildfire Protection plan.

All prescribed fire operations would be in accordance with Federal, State, and local requirements to protect air quality as required by the Federal Clean Air Act, the Environmental Protection Agency, and the California Air Resources Board.[14]

The small area of brush (approximately 52 acres) would be treated by a combination of mastication and hand treatments such as brush cutting, pruning, and piling of material. Slopes generally greater than 35 percent would be thinned by hand and piled for burning.

Proposed treatments are as follows and are summarized in Table 2.

Masticate - A tracked or rubber-tired machine chops, shreds, and/or grinds small trees, limbs, shrubs, and dead woody debris into chips. Mastication would be contingent on access and slope. Areas typically less than 35 percent slope would be chosen for mastication treatments. Shrubs and trees would be masticated throughout the project area. Mastication helps to moderate fire behavior by reducing fuel bed depth.

Mechanical thinning – Using mechanized equipment to remove trees from the understory to reduce ladder fuels and canopy densities, increase forest health and resiliency by reducing stand densities. Areas typically less than 35 percent slope would be chosen for mechanical thinning treatments.

Thin by hand – Thinning trees and shrubs using hand tools or chainsaws to create a desired spacing. Hand thinning would be implemented on slopes greater than 35 percent or in other areas deemed unsuitable for mechanized equipment.

Lop and scatter – Would be used in areas with steep slopes determined ineffective for piling and that have safety concerns for personnel.

Pruning trees – Pruning tree branches or limbs not selected for cutting using hand tools and chainsaws. Trees would be pruned approximately 8 to10 feet above ground level.

Firewood – Suitable cut trees would be made available for public firewood use.

Pile and burn – Cut trees, shrubs, pruned limbs, and dead and down woody material would be piled by hand or by machine and subsequently burned. Piles would be located away from residual trees and shrub patches to minimize scorch to the overstory tree canopies and trunks of trees.

Prescribed fire – Applying low- to moderate-intensity fire using drip torches to reduce surface and ladder fuels and break up contiguous vegetation. Prescribed fire enables fire managers to reintroduce fire to a fire-adapted ecosystem and would be used in areas as determined by the responsible official.

Hazard tree removal – The removal of hazard trees (live and dead) of all sizes would occur along roads, trails, campgrounds, and landings to provide for safety of personnel and the public.

[14] Clean Air Act (1963, amended 1977, 1990); Regional Haze Rule (40 CFF 51.308-309); Interim Air Quality Policy on Wildland and Prescribed Fire; California Air Resources Board Title 17 CCR Smoke Management Guidelines for Agricultural and Prescribed Burning.

The most cost-efficient and effective treatment within each stand would be chosen based on timing, equipment availability, and post-treatment results, but would generally be implemented as shown in Table 2.

Table 2. Treatment by stand type

Stand Type (vegetation type)	Treatment	Acres
Conifer	Manual treatment methods/hand piling of material	212
	Mechanical treatment methods	1,331
Brush	Manual treatment methods/hand piling of material	25
	Mechanical treatment methods	27
Non-forested	No treatment	87
Total Project Acres		**1,682**

Table 3 illustrates the average trees per acre (before and after treatment) in forested stands of the project area as proposed in this action.

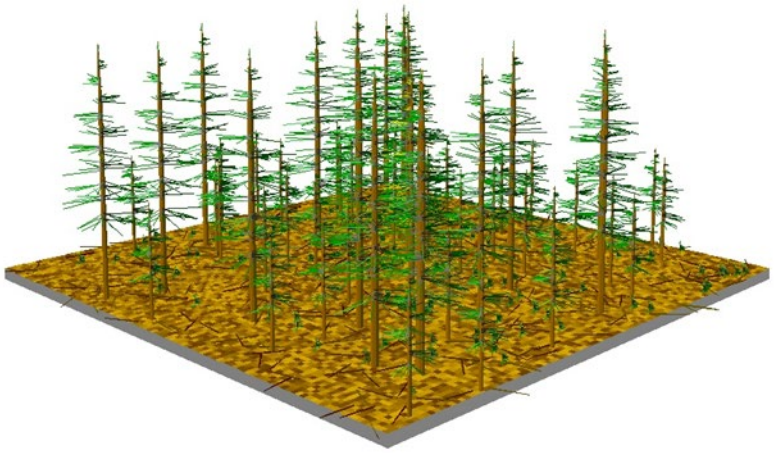
Table 3. As proposed, the anticipated pre and post average trees per acre in forested areas

Trees Per Acre (TPA) Pre and Proposed Post Treatment	4 – 12"	12-24"	24-36"	> 36"	Total/Range
2018 Ave TPA (pre-treatment)	107	30	5	3	145
2021 Ave TPA (proposed post-treatment)	16	12	6	3	47
2018 Range TPA (pre-treatment)	0 – 1,068	0 - 191	0 - 42	0 - 26	0 – 1,327
2021 Range TPA (proposed post-treatment)[15]	0 - 449	0 - 71	0 - 18	0 - 18	0 - 556

[15] Reduced number in the greater than 24-inch categories (24 -36" and 36"and greater at diameter breast height) trees in 2021 is the result of mortality predicted by the FVS model resulting from bark beetles and drought that has occurred since stand exam data was collected in 2018.

Figure 9 is a modeled computer output showing before and after treatment of a representative conifer stand in the Mount Pinos project area.

Average Stand: Before Treatment



Average Stand: After Treatment

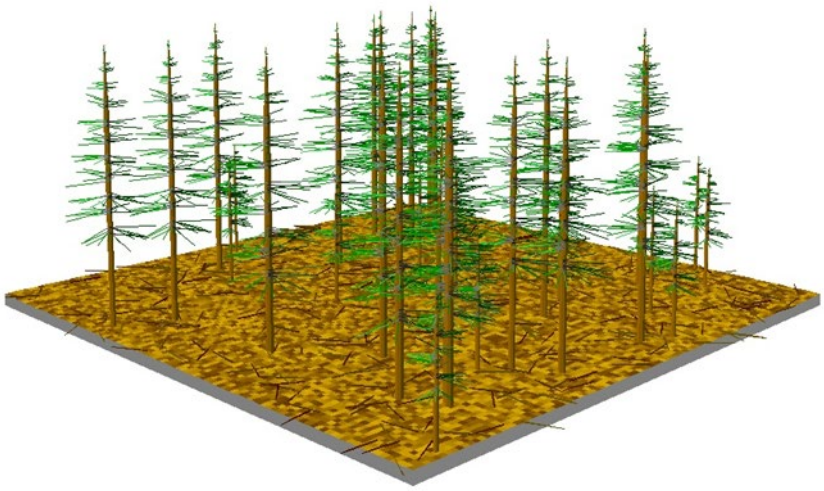


Figure 9. Visual perspective before and after treatment for the conifer stands proposed in this action

Design Elements

Fuels

1. Brush species would be reduced as needed to meet fuels management objectives.
2. Fuels remaining on site should be less than 10 tons per acre where appropriate as determined by fire managers.
3. Burn plans would be developed in compliance with the Interagency Prescribed Fire Planning and Implementation Procedures Guide (2017) and required permits would be obtained through the County Air Pollution Control District and in accordance with the Clean Air Act.
4. Prescribed burning control lines would be constructed as needed for fire holding actions and/or to protect resource concerns. Existing roads, trails, and natural barriers would be used as control lines where possible.
5. Prescribed fire control lines adjacent to or that intersect existing roads and trails would be obliterated to reduce the potential for unauthorized use.

Botany and Wildlife

1. LMP- S11: When occupied or suitable habitat for a threatened, endangered, proposed, candidate or sensitive species is present on an ongoing or proposed project site, consider species guidance documents ((see LMP, Part 3, Appendix H) to develop project-specific or activity- specific design criteria. This guidance is intended to provide a range of possible conservation measures that may be selectively applied during site-specific planning to avoid, minimize, or mitigate negative long-term effects on threatened, endangered, proposed, candidate or sensitive species and habitat. Involve appropriate resource specialists in the identification of relevant design criteria. Include review of species guidance documents in fire suppression or other emergency actions when and to the extent practicable.
2. LMP- S12: When implementing new projects in areas that provide for threatened, endangered, proposed, and candidate species, use design criteria and conservation practices (see Appendix H) so that discretionary uses and facilities promote the conservation and recovery of these species and their habitats. Accept short-term impacts where long-term effects would provide a net benefit for the species and its habitat where needed to achieve multiple-use objectives.
3. LMP-S24: Mitigate impacts of ongoing uses and management activities on threatened, endangered, proposed, and candidate species.
4. LMP-S32: When surveys for species presence/absence are done for threatened, endangered, and proposed species, use established survey protocols, where such protocols exist.

Botanical Specific Elements

1. Review threatened, endangered, proposed and sensitive plant species occurrence records from the Forest Service databases prior to project implementation. These locations will be reexamined to determine the current state and extent of the occurrences. If threatened, endangered, proposed or sensitive plant species occurrences are determined to be potentially affected by project activities, such occurrences would be avoided via flagging (i.e. the “flag and avoid” method), and avoidance area maps would be created and provided to contractors. These flagged areas would be excluded from all project activities, such as heavy equipment operations (including skid trail creation) and the piling of materials.
2. If new threatened, endangered, proposed or sensitive plant species occurrences are discovered within the project area, or if a new species with potentially suitable habitat becomes federally or regionally listed before implementation is complete, the Forest Botanist would be consulted to ensure project design features are sufficient for the conservation of the botanical resource.

Wildlife Specific Elements

1. LMP- S14: Where available and within the capability of the site retain a minimum of six downed logs per acre (minimum 12 inches diameter and 120 total linear feet) and 10 to 15 hard snags per five acres (minimum 16 inches diameter at breast height and 40 feet tall, or next largest available). Exception allowed in Wildland/Urban Interface Defense Zones, fuelbreaks, and where they pose a safety hazard.
2. LMP - S15: Within riparian conservation areas retain snags and downed logs unless they are identified as a threat to life, property, or sustainability of the riparian conservation area.
3. LMP - S17: In areas outside of Wildland/Urban Interface Defense Zones and fuelbreaks, retain soft snags and acorn storage trees unless they are a safety hazard, fire threat, or impediment operability.
4. LMP - S18: Protect known active and inactive raptor nest areas. Extent of protection will be based on proposed management activities, human activities existing at the onset of nesting initiation, species, topography, vegetative cover, and other factors. When appropriate, a no- disturbance buffer around active nest sites will be required from nest-site selection to fledging.
5. LMP- S19: Protect all spotted owl territories identified in the Statewide California Department of Fish and Game database (numbered owl sites) and new sites that meet the state criteria by maintaining or enhancing habitat conditions over the long-term to the greatest extent practicable while protecting life and property. Use management guidelines in the species conservation strategy (or subsequent species guidance document; see Appendix H) to further evaluate protection needs for projects, uses and activities.
6. LMP- S20: Maintain a limited operating period (LOP) prohibiting activities within approximately 0.25 mile of a California spotted owl nest site, or activity center where nest site is unknown, during the breeding season (February 1 through August 15), unless surveys confirm that the owls are not nesting. Follow the USDA Forest Service (1993, 1994 or subsequent) protocol to determine whether owls are nesting. The LOP does not apply to existing road and trail use and maintenance, use of existing developed recreation sites, or existing special-uses, such as recreation residence tracts. When evaluating the need to implement a limited operating period, site- and project-specific factors need to be considered (use species management strategy or subsequent guidance; see Appendix H).
7. LMP- S28: Avoid or minimize disturbance to breeding and roosting California condors by prohibiting or restricting management activities and human uses within 1.5 miles of active California condor nest sites and within 0.5 mile of active roosts. Refer to California condor species account (or subsequent species guidance document; see Appendix H) for additional guidance.
8. Avoid rocky outcrops with mechanical treatments.
9. Trash associated with this project would be removed and properly disposed of. A forest wildlife biologist or designee would brief all personnel involved in implementing the project on the importance of not leaving hazardous materials exposed and daily removal of all garbage fragments to maintain condor health. Garbage removal would be stipulated in mechanical brush treatment contracts.
10. Workers would undergo “hazing” training pursuant to the September 3, 2014 California Condor Recovery Program memo. If any California condors are attracted to work sites, the hazing measures would be implemented to avoid the possibility that the birds would become habituated to human activities, which poses a risk to their well-being.
11. Active goshawk nest stands (30 acres) would be avoided during project implementation. The limited operating period for goshawk within post-fledging family area (PFA) is March 1 - September 30. Treatments would only occur during the non-breeding season of October 1 through February 28 if goshawks are found and determined to be nesting within the project area.

12. If possible, project implementation should avoid conducting project activities during the breeding season for migratory birds (March 15-July 31)
13. Work crews should receive training on avoiding unnecessary impacts to breeding birds and other wildlife species prior to conducting project activities.
14. When possible, hazard tree removal should be conducted between September 1 and February 15. "Hazard trees" are typically either snags or damaged living trees.

Silviculture

1. In all treatments, all live and dead trees posing a safety hazard to management activities or to the public will be removed within the treated areas (Pacific Southwest Regional Hazard Tree Guidelines).
2. In all units, as soon as possible, and no longer than 24 hours after tree cutting, all activity-created fir and pine tree stumps greater than or equal to 16 inches in diameter would be treated with a borax compound (Sporax) to inhibit the spread of annosus root disease.
3. All black oak will be left unless they are deemed a hazard tree or if removal is needed for operations.

Recreation

1. Where there is a safety concern for recreationists, implement temporary closures in the project area. Ensure that sufficient public and internal notice is provided prior to those closures.
2. Throughout the duration of the project, communicate with the recreational staff to coordinate closures and/or consultation for privacy screening or potential off-highway vehicle trespass during implementation.

Heritage

1. Areas identified as impenetrable brush would be surveyed post-implementation.
2. Known heritage resources that could be impacted by operations would be flagged and protection measures would be applied.
3. No pile burning would occur within known heritage site boundaries.
4. Trees near known cultural resources would be felled away from site boundaries, to avoid damage to sensitive features or artifacts.
5. Upon ground disturbing activities, if unanticipated resources are discovered, cease project work in the area and notify the Forest Archaeologist and Tribal Liaison immediately. If human remains are uncovered, suspend activities immediately and notify the Forest Archaeologist, Tribal Liaison and local law enforcement. Project work in the area of the unanticipated discovery would not resume until the discovery has been secured and evaluated.

Scenery

1. LMP - S9: Design management activities to meet the Scenic Integrity Objectives (SIOs) shown on the Scenic Integrity Objectives Map.
2. LMP - S10: Scenic Integrity Objectives will be met with the following exceptions:
   - Minor adjustments not to exceed a drop of one SIO level is allowable with the Forest Supervisor's approval.
   - Temporary drops of more than one SIO level may be made during and immediately following project implementation providing they do not exceed three years in duration.

3. Treatments should have form and shape that simulates natural patterns and openings and treatment boundaries should be blended to minimize visibility of treatment edges (such as avoiding straight lines, sharp corners, or geometric shapes). The edges of treatments should be: tied into existing meadows and openings where possible, follow natural topographic breaks and changes in vegetation, or provide feathering that allows gradual transition into the untreated adjacent forest area (as opposed to an abrupt line).
4. Tree spacing should be irregular to retain the appearance of unmanaged forested stands. When feasible, retain trees in natural-appearing groups or clumps to break up openings and meet high scenic integrity objective. Leave trees may be young to mature in age classes. Operators would take care to protect them from machinery.
5. Visible stumps within 300 feet of Frazier Cuddy Road (S349) and recreation sites shall be cut as low as possible (recommended 4 inches, maximum 6 inches).
6. Dispose of slash as soon as possible while also meeting fuels management objectives. Locate landings and dispose of slash out of sight of Frazier Cuddy Road (S349) and recreation sites where feasible

Soils and Watershed

1. Designate season of use to avoid or restrict road use during periods when use would likely damage the roadway surface or road drainage features (National BMP Road-4. Road Operations and Maintenance).
2. Use suitable measures to avoid or minimize adverse effects to soil and watershed resources when proposed operations involve use of roads by traffic and during periods for which the road was not designed (National BMP Road-4. Road Operations and Maintenance).
3. Refueling of equipment and storage of fuel and other hazardous materials will not occur within riparian conservation areas (perennial and seasonal streams, seeps, springs, and meadows). When landings are located within riparian conservation areas, refueling will occur outside riparian conservation areas in an approved refueling area. Storage of any quantity of fuel greater than 100 gallons will require a California Engineer Spill Plan (National BMP Road-10. Equipment Refueling and Servicing).
4. Landings would be located outside of riparian conservation areas where possible, unless infeasible due to topography. Landings within riparian conservation areas may occur where there is existing disturbance (instead of constructing a new one); such landings will require special protective measures as specified by an earth scientist or biologist (National BMP Veg-2. Erosion Prevention and Control). Upon project implementation, landings used in riparian conservation areas not associated with existing road infrastructure would be rehabilitated.
5. Do not permit use of mechanical equipment on slopes greater than 35 percent or on steeper slopes with short pitches (National BMP Veg-2. Erosion Prevention and Control).
6. Operate equipment when soil compaction, displacement, erosion, and sediment runoff would be minimized (National BMP Veg-2. Erosion Prevention and Control).
7. Avoid ground equipment operations on unstable, wet, or easily compacted soils unless operation can be conducted without causing excessive rutting, soil puddling, or runoff of sediments directly into waterbodies.
8. Riparian conservation areas will be 100 meters (328 feet) on perennial streams, or 30 meters (98 feet) on intermittent streams, measured as the slope distance from either bank of the channel. Other special aquatic features, such as wetlands, seeps, and springs, also have 100-meter riparian conservation areas (National BMP Veg-3. Aquatic Management Zones).

9. No self-propelled ground-skidding equipment is allowed within the riparian conservation areas (exceptions would require input by an earth scientist and/or biologist as described in standard S47 and Appendix E of the Forest Plan).
10. There will be no removal of riparian plant species.
11. Within riparian conservation areas, retain snags and downed logs to the extent possible. Exceptions would be made if snags and logs are identified as a threat to life, property, or sustainability of riparian conservation areas (S15, LMP Part 3, p. 6) (National BMPVeg-3. Aquatic Management Zones).
12. Firelines constructed for project implementation will be rehabilitated following project implementation (prescribed burn). Rehabilitation on the fireline includes: pulling back and spreading out berms, and spreading of bush and ground cover across the fireline (Fire-2. Use of Prescribed Fire).
13. Conduct pile burning, for slash disposal, in a manner that encourages efficient burning to minimize soil impacts while achieving treatment objectives (Fire-2. Use of Prescribed Fire).
14. Locate slash piles in areas where the potential for soil effects is lessened (meadows, rock outcrops, etc.) and that do not interfere with natural drainage patterns (Fire-2. Use of Prescribed Fire).
15. Avoid burning when conditions will cause the fire to burn too hot and damage soil conditions (Fire-2. Use of Prescribed Fire).
16. Avoid piling and burning for slash removal in riparian conservation areas to the extent practicable (Fire-2. Use of Prescribed Fire).
17. Water bars or leadout ditches may be constructed in firelines to minimize erosion. Water bars or leadout ditches will be installed according to the following recommended minimum intervals (Fire-2. Use of Prescribed Fire).

Table 4. Recommended minimum interval guidelines for the installation of waters bars

Fireline gradient ***(% slope)***	**Distance between water-bars** ***(feet)***	**Distance between water-bars** ***(chains)***
0 to 5	no water-bars needed	no water-bars needed
6 to 15	200	3
16 to 30	100	1.5
31 to 49	75	1
> 50	50	0.5

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