



DECISION NOTICE AND FINDING OF NO SIGNIFICANT IMPACT
KEOLA FUELS AND FOREST HEALTH PROJECT
HIGH SIERRA RANGER DISTRICT, SIERRA NATIONAL FOREST
U.S. FOREST SERVICE

SECS 14, 15, 16, 21, 22, 23, T8S, R25E, MDM
FRESNO COUNTY, CALIFORNIA

BACKGROUND

The Keola Fuels and Forest Health Project (Keola Project) area is approximately 1,400 acres, of which approximately 550 acres were proposed for treatment in the environmental assessment (EA). The project area is located in a portion of the Huntington Lake Recreation Area, west and southwest of Huntington Lake and includes numerous homes and facilities. The recreation area sees well over 200,000 visitor-days each year and is considered one of the premier high elevation lakes for boating events. Scenic values in the recreation area are high. Forest health is also an important consideration in the management of this high recreation use and visually sensitive area.

Past logging practices in the area and long-term fire suppression have changed the make-up of the stands from mixed conifer to almost pure stands of high density, smaller diameter, true fir (mainly white fir [*Abies concolor*]) with heavy dead and down fuel loading.

The project is entirely within the Wildland Urban Interface (WUI) defense zone. Presently the project area has predicted flame lengths that vary from one to 66 feet, areas where predicted fire type is crown fire, and predicted rate of fire spread is one to 68 chains per hour under very high fire weather conditions. This fire behavior is outside the desired conditions for WUI defense zones noted in the Sierra Nevada Forest Plan Amendment Record of Decision (2004; p. 40); puts life and property at risk from an unusually severe wildland fire event and could adversely affect fire suppression operations and firefighter safety.

In addition, a report on forest health completed in the recreation area in 2009 identified multiple forest health issues in the Keola area including tree stress related to high densities, annosum root disease, dwarf mistletoe and bark beetles.

DECISION

Based upon the analysis and evaluation documented in the Keola Project EA and associated record, comments received from interested parties, the one objection raised during the objection period, and direction from the Sierra National Forest Land and Resource Management Plan, as amended (Forest Plan), I have decided to implement alternative 2, (proposed action) as described in attachment 1 to this decision. The proposed action includes approximately 550 acres of manual, mechanical, and prescribed fire treatment methods and approximately 1.5 miles of temporary road construction. The decision also includes a non-significant project-level Forest Plan amendment of allowing the removal of live diseased trees in unit 60 that are greater than 30 inches dbh (it is anticipated that less than 20 trees will be removed that meet the criteria).

DECISION RATIONALE

My decision to implement the proposed action considered existing conditions, meeting the purposes and needs for the project, environmental effects and public comments. My conclusion is based on a review of the record that shows a thorough analysis using the best available science. I also considered direction provided in the Forest Plan, environmental laws (e.g., Endangered Species Act, Clean Water Act), and related regulations and policies. Based on information in the EA and record, I believe the proposed action best meets the purposes and needs for action while minimizing adverse effects to the environment.

The key considerations I used in making my decision include:

- Under 95th percentile fire weather conditions, the proposed action will reduce predicted flame lengths to less than four feet, modify fire type in all treatment units to surface fire and reduce the rate of spread over the treatment areas by 50 to 70 percent when compared to the no action alternative (EA, pp. 42-43).
- The proposed action improves the treated stand's ability to withstand drought cycles from insect and disease-driven mortality above endemic levels. The proposed action will reduce the density of the stands which should increase available water and nutrient potential and improve stand resiliency to the drought cycles that are common in California. Increased individual tree vigor and growth through thinning will reduce the risk of some bark beetles and pathogen mortality. The proposed action also removes susceptible trees around known annosum root disease pockets reducing the risk of these pockets expanding, and reduces the rate of mistletoe increasing over time. The other two alternatives (no action and non-commercial funding alternatives) provide less or no beneficial effects to forest health (EA, pp. 52-53).
- The proposed action maintains or increases the valued scenic character and its scenery attributes through time and ecological progression at a higher level than the other alternatives. This is accomplished by providing a more open, park-like setting with diverse forest canopy and vegetative mosaics through treatments (e.g. reducing stand density, treating the dead and down surface fuels, broadcast/under burning). Should a wildfire occur during very high fire weather conditions after the implementation of the proposed action, the risk of high tree mortality that would adversely affect the scenic character of the area is reduced when compared to the other two alternatives. Thinning the stands also reduces the risk of insect mortality that is above endemic levels which would also adversely affect the scenic character (EA, pp. 59-61).
- Reducing the risk of high fire severity in the treatment areas will have long-term beneficial effects on wildlife species that require late seral habitat. The proposed action reduces more basal area than alternative 3, the non-commercial funding alternative (EA, p. 49) which will promote individual tree growth (EA, p. 54), increasing the rate at which stands will have late seral characteristics (EA, p. 71) and will reduce the risk of existing stands having high tree mortality should a wildfire occur during 95th percentile weather conditions (EA, p. 49).
- Design features are incorporated into the proposed action (attachment 1) to minimize adverse impacts to resources within the project area (EA, pp. 20-31).
- The impacts from the proposed action based on key issues brought up during scoping (and again addressed in the objection) were within the standards and guidelines of the Forest Plan

and/or not considered significant adverse effects, and in many cases would have long-term beneficial effects to these resources (EA, pp. 53-55, 70-74).

- The proposed action results in approximately 1.1 million board feet of commercial sawlog timber. The proposed action provides the highest cost-efficiency while meeting the fire and fuels needs for the project. The timber value will help compensate for costs to implement the project (EA, p. 77).

The Keola Project EA documents the environmental analysis and conclusions upon which this decision is based.

OTHER ALTERNATIVES CONSIDERED

Alternative 1 is the no action alternative. Under this alternative, the project area would not receive proposed treatment activities at this time. This alternative represents the existing condition and expected future conditions against which other alternatives were compared. No action would not meet the purposes and needs for the project and would allow the existing environment of overstocked stands and heavy fuel loads to continue.

Alternative 3 is the non-commercial funding alternative in which the sole intent is to achieve the fuels reduction goals and where all proposed treatments are directed at reducing hazardous fuels. The main difference between the proposed action (alternative 2) and alternative 3 is the level of commercial harvest that is proposed. Alternative 3 commercial harvest prescriptions would be to thin from below at a maximum of 12-inch dbh except for unit 54, which would have a dbh limit of 16 inches.

This alternative was considered in the decision but was not chosen for the following reasons:

- Alternative 3 meets the other needs for the project at a lower level when compared to the proposed action:
 - Approximately 10 percent of the treatment areas will still have high mortality risk from insects and this risk increases at a more rapid rate when compared to the proposed action. Alternative 3 also does not treat the annosum root disease pockets and overtime, does not reduce the rate of mistletoe increasing over the project area at the same level as the proposed action (EA, p. 55).
 - The scenic attributes will be maintained or enhanced but not to the extent as the proposed action. The stands will not be as open and park-like and the risk to high tree mortality due to an insect outbreak is greater overtime (EA, pp. 62-63).
- Fewer trees are removed in all size classes when compared with the proposed action and overtime, large trees will occupy a lower percentage of basal area (individual trees will grow at a slower rate); therefore, the rate of development into late seral habitat conditions will be slower (EA, p 71).
- Alternative 3 provides approximately 0.155 million board feet of commercial sawlog timber and has a lower cost-efficiency than the proposed action (EA, p. 77).

COLLABORATION AND PUBLIC INVOLVEMENT

In compliance with the Healthy Forest Restoration Action, two collaboration meetings were held for the Huntington Basin (August 28 and October 16, 2010) that included stakeholders in the area. The second meeting included a specific discussion of the Keola Project. Several comments from the meetings were incorporated into the project design.

The project was originally listed as a proposal on the Sierra National Forest Schedule of Proposed Actions beginning in October 2010 and updated periodically during the analysis. People were invited to review and comment on the proposed action through mailings (dated December 20, 2010) to potentially interested individuals, organizations, and agencies; through the posting of the scoping letter, scoping document and proposed treatment map on the Forest website soon after the letters were mailed; and a legal notice published in the *Fresno Bee* on December 20, 2010. Separate letters (dated November 30, 2010) were sent to Native American tribes, individual tribal members and non tribal organizations. A public meeting was also held on January 4, 2010.

Three comments were received during scoping: one in support of the project, one from a Native American tribe that said the project was beyond its area of interest, and one that provided a list of concerns related to the proposed action. Many of the concerns were considered in the analysis as key issues.

The pre-decisional objection opportunity was offered on the proposed action under 36 CFR 218: one objection was filed during the objection period. A meeting was offered to the objector. The objector provided options to resolve the objection (retain all trees greater than 20 inches dbh, or trees greater than 20 inches that were proposed for removal should be turned into snags, or a combination of both) and stated if the Forest Service was not willing to make significant changes to the proposed action, it would not be a good use of either party's time to meet.

I and my staff reviewed the objector's proposals and determined that the options did not meet the purposes and needs for the project. The Reviewing Officer (Deputy Regional Forester) responded to the objection with a letter to the objector, dated November 10, 2011, stating my rationale for the project was clear and the reasons for the project were logical and responsive to the direction contained in the Forest Plan and Healthy Forest Restoration Act. The Reviewing Officer acknowledged that we made reasonable and appropriate efforts to resolve the concerns while maintaining a balanced approach to managing the lands and meeting the purpose of the project.

FINDING OF NO SIGNIFICANT IMPACT

In reaching my determination under 40 CFR 1508.27 that preparation of an environmental impact statement is not needed, I considered the significance factors and information developed during the analysis of the proposal, which was disclosed in the Keola Project EA. These factors are found as a section in the EA under chapter 3 (pp. 78-83) and are summarized below:

Context

Although the Keola Project directly affects 550 acres of the 4,700-acre Huntington Lake Recreation Area, the majority of the project area is not accessible to the general public by motor vehicles. Due to the size and general location within the recreation area, the project is not likely to significantly affect society as a whole in the region, state, or nationally. This project could have an effect on the local timber industry by providing timber to the southern California sawmills. The effect will not be significant (1.1 MMBF) and will be short-term (during the life of the contract).

Intensity

The intensity of effects was considered in terms of the following:

1. **Impacts may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that, on balance, the effect will be beneficial.** Beneficial effects have not been used to offset or compensate for potential adverse effects. Singularly and collectively, the resources affected by the proposed action are not likely to be exposed to significant impacts.

The adverse impacts associated with the proposed action include:

- Short-term impacts (up to 3 years) to the scenic quality as seen from several key viewing points such as cabins, Huntington Lake Road, and Keola Camp.
- Short-term impacts will occur to rodents (prey species for special status species) during treatment activities (rodent habitat and individuals will likely be destroyed).
- A short-term impact total net loss of 24 acres of early and mid seral coniferous forest habitat will occur. Presently there are 366 acres of these two habitat types within the treatment units.
- A short-term impact with an initial loss of 41 acres of the 83 acres of late seral closed canopy coniferous forest habitat in the treatment area.
- A short-term impact initial loss of 89 of the 127 acres of California spotted owl habitat and 44 acres of the 297 acres of moderate to high capacity Pacific fisher habitat will occur.

In addition to the reasons for choosing this alternative noted earlier, other beneficial effects include:

- A short-term beneficial impact by initially increasing late seral open canopy coniferous habitat by 69 acres. In the existing condition (no action), there are 53 acres of this habitat type within the treatment areas.
 - Reducing the density of stands will increase foraging habitat for several raptors, including the California spotted owl.
2. **The degree to which the proposed action affects public health or safety.** Several needs for the project involve human safety (i.e., reduce the risk of life and property and improve effectiveness of fire suppression operations and firefighter safety from an unusually severe wildland fire event). The proposed action was developed to provide for improvements to human health and safety through hazardous fuels reduction and the removal of hazard trees.
 3. **Unique characteristics of the geographic area, such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.** Unique characteristics for this project are defined as: proximity to historical or cultural sites, wetlands, and Huntington Lake.

Design features for cultural/heritage resources (attachment 1, design features CR-1 to CR-6) provide protection to any historic or cultural sites within the treatment areas and include avoidance, restrictions on treatment, monitoring, and implementation of protection measures should new sites be found. It also requires that project implementation comply with the stipulations in the Regional Programmatic Agreement with SHPO dated 2001 and *Interim Protocol for Non-Intensive Inventory Strategies for Hazardous Fuels and Vegetation Reduction Projects* (2004). These measures are designed to avoid any potential impacts to historic or cultural resources.

Design features were developed to minimize impacts to wetlands and the lake. There is a 100-foot mechanical equipment exclusion zone from edges of meadows or other special aquatic features and direct ignition for prescribed fire is not allowed in Riparian Conservation Areas/Stream Management Zones (attachment 1, design feature WLD-25). Due to these protection measures, no significant impacts are predicted to wetlands or Huntington Lake.

4. **The degree to which the effects on the quality of the human environment are likely to be highly controversial.** Based on the analysis, there is no indication that the effects of the proposed action on the quality of the human environment are likely to be highly controversial. Proposed treatments including harvest methods, fuels treatment methods and road management actions are routine activities that are predominantly consistent with the Forest Plan. (A Forest Plan amendment affecting one unit is included in the decision.) Activities were designed to minimize or eliminate potential effects on the human environment.
5. **The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.** All of the proposed management practices/treatments under the proposed action have been conducted both separately and in various combinations within similar landscapes and vegetation types. The Huntington Basin was originally logged when the reservoir was constructed (1911-1913). The nature and magnitude of the effects to the human environment from implementing the proposed action are well understood (thinning, fuel reduction, temporary road construction and road maintenance) and do not have highly uncertain effects on the human environment or involve unique or unknown risks.
6. **The degree to which the action may establish a precedent for future actions with significant effects, or represents a decision in principle about a future consideration.** The proposed action is project-specific and does not establish a precedent for future actions with significant effects. Any future projects will need to consider all relevant scientific, site-specific information available at that time, and complete an independent analysis of environmental consequences. The proposed action does not involve future connected actions that have not already been addressed in this document (e.g., dust abatement, road maintenance).
7. **Whether the action is related to other actions with individually insignificant but cumulatively significant impacts.** Based on the cumulative effects analysis noted in the Keola Project EA (i.e., fuels, vegetation, scenery, wildlife), along with those completed for other resources (e.g., special status aquatic and plant species, cultural resource sites, air quality, hydrology, soils) and documented in each specialist report available in the project planning record, there will be no significant cumulative effects. The proposed action, along with similar past, present, and foreseeable actions, will increase health and vigor to the treated stands, decrease the risk of insect outbreaks, reduce the risk of high fire severity over time, and increase the scenic stability in the treated areas within the Huntington Lake Basin. There will be short-term cumulative adverse effects to scenery and wildlife species dependent on high canopy cover (mainly after implementation of the vegetation treatment projects) but based on the scale of these vegetation treatment activities, the cumulative effects will not be significant to these resources.
8. **The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed, or eligible for listing, in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.** As noted in intensity factor 3 above, the proposed action will comply with the Regional Programmatic Agreement (2001) and *Interim Protocol for Non-Intensive Inventory Strategies for Hazardous Fuels and Vegetation Reduction Projects* (2004). With the compliance with these agreements and implementation of design features CR-1 through CR-6, the Proposed Action will have no effect to cultural and historic resources.
9. **The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.** There are no current threatened or endangered (T&E) plant or animal species within the

project area on the Sierra National Forest. The proposed action will initially reduce the 297 acres of moderate to high capability habitat for Pacific fisher (a candidate species) to 253 acres (based on CWHR modeling). Several design features will reduce potential effects to this species (attachment 1, design features WLD-13 through WLD-16) from the project.

10. **Whether the action threatens to violate Federal, State, or local law or requirements imposed for the protection of the environment.** The proposed action is in compliance with federal, state, and local laws and other requirements imposed for the protection of the environment. Based on the project design (attachment 1) and effects analysis (summarized in chapter 3 of the Keola Project EA and detailed in the various specialist reports available in the project planning record), the proposed action is in compliance with environmental laws, regulation, and policy.

The Forest Service Manual (FSM) provides additional National Forest Management Act management direction, regarding species viability. FSM 2670.32 provides direction to avoid or minimize impacts to species whose viability has been identified as a concern. This includes Forest Service sensitive species. Regarding sensitive wildlife and plant species, design features are incorporated in the proposed action to minimize impacts to special status species and their habitat (attachment 1, design features WLD-5 through WLD-17 and BOT-1 through BOT-6). Based on the botany and wildlife review and biological evaluations, there will be no to negligible impact to Forest Service sensitive plants from the proposed action and little to moderate short-term impacts to sensitive wildlife species and their habitat.

The management indicator species report determined there are potential short-term beneficial effects to late seral open canopy coniferous habitat; negligible adverse impacts to early and mid seral habitat; and moderate short-term adverse impacts and long-term beneficial impacts to late seral closed canopy coniferous habitat.

The noxious weed risk assessment report analyzed potential effects from noxious weeds. Implementing the invasive plant design features (attachment 1, design features WEED-1 through WEED-8) will reduce the risk of invasive weeds expanding into the project area; therefore, the proposed action is in compliance with Executive Order 13112 of February 3, 1999.

Based on the water resource report the proposed action complies with the Clean Water Act by implementing the Best Management Practices noted in appendix A in this decision. The cumulative watershed effects analysis determined the proposed action will have little cumulative effect to the five HUC8 subdrainages. The Keola proposed action will increase the subdrainages equivalent road acres (ERAs) by 0.1 percent.

Based on the air quality report, the proposed action adheres to the particulate matter standards set by the San Joaquin Valley Unified Air Pollution Control District. Estimates of emissions produced from the proposed action were calculated in order to ensure that the project stays below the threshold of significance established by the air quality management district. By not exceeding the level of significance, the proposed action will not impede the progress of the air quality management district towards attainment of the National Ambient Air Quality Standards; therefore, the proposed action is compliant with the Clean Air Act.

As noted in intensity factors 3 and 8, there will be no effect to heritage resource sites. By complying with the Regional Programmatic Agreement (2001) and *Interim Protocol for Non-Intensive Inventory Strategies for Hazardous Fuels and Vegetation Reduction Projects* (2004)

and implementing design features CR-1 through CR-6, the proposed action is in compliance with the National Historic Preservation Act.

Executive Order 12898 relating to Environmental Justice requires an assessment of whether minorities or low-income populations will be disproportionately affected by any proposed action. The proposed action is located in a recreation area that does not have a disproportionate number of minorities or low-income populations; therefore, there will be no disproportionate effects on minorities or low income populations.

The proposed action will be located entirely on National Forest System lands and does not conflict with planning objectives for the local county or tribes.

The proposed action was designed to incorporate applicable standards and guidelines in the Forest Plan. The Forest Plan has been reviewed in consideration of the proposed action and I find that the project design is consistent with the Forest Plan.

FINDINGS REQUIRED BY OTHER LAWS AND REGULATIONS

As noted in intensity factor 10 above, the proposed action is in compliance with the Forest Plan, as amended, and other laws, regulations and policies.

ADMINISTRATIVE REVIEW (APPEAL) OPPORTUNITIES

The pre-decisional administration review process for this project has been completed in compliance with 36 CFR 218. Projects authorized under the Healthy Forest Restoration Act are not subject to appeal (36 CFR Part 218.3(a)); therefore, no additional administrative review opportunities exist.

IMPLEMENTATION DATE

Implementation of this project may begin immediately.

CONTACT

For additional information concerning this decision, contact: Ramiro Rojas, District Silviculturist, High Sierra Ranger District, Sierra National Forest, 29688 Auberry Road, Prather, CA 93651; phone (559) 855-5355.

SCOTT G. ARMENTROUT
Forest Supervisor
Sierra National Forest

Date

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ATTACHMENT 1

Alternative 2: The Proposed Action

The proposed action includes approximately 550 acres of manual, mechanical, and prescribed fire treatment and approximately 1.5 miles of temporary road construction. Estimated volume of timber removed will be 1.1 million board feet (MMBF). Treatment areas are entirely within the WUI defense zone on National Forest System lands. The WUI defense zone will be modified from the Sierra Nevada Forest Plan Amendment (SNFPA; 2004) because the structures in Camp Keola, Lakeview Cottages, Huntington Lake Resort and the Dowville Day-use Picnic Area were not included in the original WUI urban core or defense zones for the Sierra National Forest. Actual WUI boundaries will be modified at a later date. This project anticipates, at a minimum, treatment units to be located in WUI core or WUI defense zones to adequately protect the health and safety of the public and the structures in the project area.

Table 2 provides a summary of treatments proposed by unit. Figure 1 is a map of the proposed action showing a summary of treatment areas and activities, and location of temporary roads. As noted in figure 1 and table 2, there may be multiple treatments within a treatment unit.

Vegetation Treatment Prescriptions and Methods

Many of the treatment units have multiple treatment prescriptions; therefore, the treatment acres overlap. The following treatment activities are generally noted in the order in which the expected treatments will occur (e.g., commercial harvest will occur before precommercial thinning).

Stand Prescriptions

Commercial Harvest Treatments

Commercial harvest treatments are the mechanical cutting (e.g., mechanical harvesters, chainsaws) of conifer trees at a minimum of 10-inch diameter at breast height [dbh]) with ground based equipment (tracked and/or rubber-tired). The trees will be harvested by cutting off 6-inch tops and the majority of limbs, cutting the tree into log lengths on site, skidding logs to designated landings, piling the logs at the landings, and moving logs to the mill with logging trucks.

All cut, true fir stumps greater than 15 inches dbh will be treated with an EPA registered borax fungicide, such as Sporax,[®] for the prevention of the spread of annosum root disease. For areas within 300 feet of structures (e.g., cabins), all cut, true fir stumps greater than 3 inches dbh will be treated. Sporax[®] will be applied by hand, in an approved granular form within one hour of stump creation. The fungicide will not be applied when it is raining. All Forest Service policies and practices, and California regulations relating to pesticide use will be followed including developing a spill plan for the Sporax[®] use.

No trees greater than 30-inch dbh or snags greater than 15-inch dbh will be removed unless severely weakened by disease, near structures or improvements, or the tree/snag could pose a safety hazard to fire suppression forces should a wildfire occur in the area (e.g., hazard tree risk ranking system is defined in appendix E of the vegetation and silviculture specialist report, including those trees that will likely die within the next ten years).

Priority tree species to retain during this activity are: disease-free sugar pine (*Pinus lambertiana*), California juniper (*Juniperus californica*), California black oak (*Quercus kelloggii*), western white pine (*Pinus monticola*), and quaking aspen (*Populus tremuloides*); the tallest trees; and those trees with the largest crowns and straightest boles that are free of damage from insects, disease and physical or mechanical causes.

Variable spacing will be encouraged for the development of historic vegetative conditions and quality wildlife habitat.

Target basal area range for each treatment unit proposed for commercial harvest is summarized in table 1. In any given clump of trees, basal area reduction will not be greater than the removal of one third of the existing basal area.

Table 1. Comparison of target basal area range and existing basal area for treatment units proposed for commercial harvest for alternative 2.

Treatment unit #	Target Basal Area Range (ft ² /ac)	Existing Average Basal Area (ft ² /ac)
42	160-180	198
44	160-180	211
45	190-210	236
48	120-140	165
50	160-180	204
51	80-100	115
52	150-170	228
54	180-200	322
59	160-180	222
60	120-140	169
65	160-180	230
126	120-140	158

There are three commercial treatment prescriptions proposed:

Thin-from-Below

The thin-from-below prescription will be for relatively even-aged stands. Thin treatment units under the following criteria until the target basal area range is reached (table 1):

- Priority for removal will be based on the following canopy classes: suppressed, intermediate, co-dominate trees.
- Among trees of the same canopy class, priority for removal based on tree species is: white fir, red fir (*Abies magnifica*), lodgepole pine (*Pinus contorta*), and Jeffrey pine. Where there is a red fir mistletoe infested overstory, red fir will become the first species priority for removal.
- Among trees of the same canopy class priority and trees species priority, trees will be given priority based on the health of the tree. The following are indicators of poor tree health: trees with less than 15 percent live crown; trees with signs of mistletoe; visible conks; visible signs of rot; bark beetle activity (e.g., boring material on the bark or base of the tree); and a minimum of two live trees deep surrounding a known annosum root disease pocket. If there is a tree of extremely poor health of a species of a lower removal priority (e.g., Jeffrey pine with mistletoe and a 5 percent live canopy) adjacent to a tree of good health in a higher priority species or class (e.g., white fir), the tree of extremely poor health will be the priority tree for removal.

- If all other priority levels are the same, trees will be chosen based on which tree has the lower percentage of live crown.
- If there is a quaking aspen stand within the treatment unit, the conifer basal area along the edges of the aspen stand will be lower than the remaining unit to provide additional habitat for the aspen stand. This will not be a group select, but a heavier thin.

The thin-from-below prescription is proposed for approximately 254 acres in the project area.

Single Tree Selection

The single tree selection prescription will be for relatively mixed story stands. Treatment will involve the removal of suppressed, intermediate, and co-dominant trees within each size class of trees until the target range basal area level is reached (table 1). Priority trees for removal will be the same as the thin-from-below criteria. The criteria for retaining understory trees will ensure that the understory trees retained will not be ladder fuel to the taller and larger nearby trees. The objective will be to create single story groups of near equal age/size. Approximately 103 acres are proposed for single tree selection treatments.

Sanitation

The sanitation prescription will involve the removal of live trees which pose forest health issues, including trees which are hazard trees or are likely to die in the next ten years. This treatment prescription is within 300 feet of structures. The following criteria for removal will include:

- Potential hazard trees as defined in appendix D of the vegetation and silviculture specialist report will be designated for harvest by certified timber cruisers.
- Trees in the understory of the same species as trees infected with mistletoe in the overstory.
- Trees that show the poor health indicators, tree condition class, and tree species priority noted in the thin from below treatment prescription.

The retained basal area will not go below the target basal area level (table 1) unless there is a pocket of hazard trees in an area. If a particular tree has a unique personal value to the special use holder, the tree will not be removed unless it is determined to be a hazard tree.

Approximately 23 acres are proposed under this prescription, entirely located in unit 60.

Precommercial Thin

The precommercial thin prescription is the cutting of young trees less than 10 inches dbh with chainsaws. These small sized trees will be left at a variable spacing ranging from 16 to 20 feet, excluding the overstory canopy, if applicable. Pine species will be the priority tree species to retain. In addition, the most well formed and healthiest trees will be priority leave-trees. The precommercial thinning criteria will ensure the retained small sized trees will not act as a fuel ladder to taller and larger sized trees. Approximately 401 acres are proposed for precommercial thinning within the project area.

Fuels Prescription

Activity Fuels and Natural Fuels Treatment Methods

Where the level of dead and down woody debris is above the fuels objectives (10 tons per acre) due to the amount of fuels generated from the commercial and precommercial thinning activities and the natural fuels that existed prior to treatment, one of the following treatment methods could occur:

Mastication

Down fuels will be masticated (mowed/shredded) with mechanical equipment (typically tracked with a cutting head mounted on an articulating arm). The equipment is able to reach slopes greater than 35 percent slope with the articulating head. The debris will be shredded into small pieces that will be left on site or later burned. Approximately 40 acres are proposed for mastication (units 45 and 52).

Hand or Tractor Pile

Dead and down material will be manually hand piled. Hand piling of slash three inches in diameter or larger will occur in portions of unit 60 and all of unit 43. In unit 60 and 300 feet from structures, the material will be hand piled or removed to a disposal site for burning. Tractor piling could occur in this area under special circumstances and agreed to by the Forest Landscape Architect. The disposal site has been used in the past and will be located off of road 7S05 approximately 1.5 miles from the project. In unit 60, the slash generated from the project will be removed and/or piled outside the special use permit boundaries. Tractor piles of the dead and down material will be created using a brush rake or grapple attached to a tractor (or similar machinery). Hand piling will total approximately 44 acres; tractor piling will occur in approximately 301 acres within the project area.

All piles will have a good base to keep the pile from toppling and will have enough distance between piles to prevent premature ignition during burning. Piles will be located so that burning will cause minimal damage to standing green trees. Depending on the size of the residual trees, this will be construed to be at least 20 feet from the bole of any live tree.

If the green conifer slash is piled, slash piles will be located in open, sunny locations outside of the dripline of leave (residual) trees and kraft paper may be used to protect an ignition point from wet weather. Slash piling will typically occur from July 1 through October 31 to enhance the drying of created slash and reduce the build-up of detrimental insect populations (except when restricted by a limited operating period [LOP]).

Prescribed Fire

Two prescribed fire methods will be used: burn piles and broadcast burn. Burning could only be initiated on "burn days" designated by the State Air Quality Control Board when satisfactory wind dispersion conditions prevail (Forest Plan, Standard 218, p. 4-25).

Burn Piles

Piles generated from hand (manual) and mechanical equipment will be burned. Piles are typically ignited with drip torches. Fire will be allowed to creep between piles while maintaining a burn intensity that will minimize tree bole scorch height or mortality of the retained trees. The burn piles will total the sum of the tractor and hand piles (approximately 345 acres).

Broadcast Burn

Broadcast burning will include burning the understory of treatment units with tree canopy overstory (i.e., underburning) and burning blocks of shrub covered treatment units with no overstory. Typically these burns occur in the spring or fall when fuel moistures are low enough to carry the fire and burns at cooler temperatures to protect overstory vegetation (where applicable). Where there are no existing control lines (e.g., roads, natural barriers such as wet drainages), firelines will be constructed. On slopes less than 35 percent, firelines will be tractor constructed and on slopes greater than 35 percent, handline will be constructed. Both types of lines will involve scraping down to mineral soil and constructing waterbars for erosion control. Ignition typically will occur with drip torches, but a helitorch could be used in the shrub treatment units. Broadcast burning totals approximately 139 acres.

Reforestation Prescriptions

Reforestation involves tractor site preparation prior to planting (where applicable), planting, and release of the seedlings.

Tractor Site Preparation

Heavy equipment will be used to scrape slash, brush, and other debris from an area where planting is proposed, and pile the material for burning. The area proposed for tractor site preparation is in an area where piling for hazardous fuels treatment is not proposed. This involves approximately one acre of treatment in treatment unit 48.

Planting

Pockets of openings (half to one acre in size) within treatment units will be planted with conifer tree seedlings that are endemic to the forest type. Species planted could include Jeffrey pine, sugar pine, white fir, and red fir. The species mix will be consistent with the project fire regimes of more frequent wildfire (higher percentage of pine). Seedling species selection will consider those openings where the adjacent overstory is heavily infected with mistletoe (i.e., the tree seedlings planted will not be of the same species as the heavily infected mistletoe trees). Where the annosum root disease pockets are treated, pine species will be planted in those openings (pines are resistant to the annosum root disease that infect true fir).

Multiple species of tree seedlings will be planted together and the tree best adapted to the site will survive or selected during pre-commercial thinning activities (which could occur at a later date as a separate project and separate NEPA decision). A total of 11 acres are proposed for planting within the project area.

Plant seedlings will be distributed to special use holders to plant within their lots. Education and guidance will be provided by the Forest Service for proper species mix and planting spots to assure that seedlings do not become fire hazards in the future.

Release

Release treatments will occur after planting or in natural stands with clumps of tree seedlings and/or saplings. These areas vary in size from 0.2 to 4 acres in size. Release treatments involve removing

vegetation that is competing with the seedlings or saplings, or have re-invaded the site preparation treatment area. Vegetation will be removed by hand (manual) with hand-cutting tools. This will involve hand grubbing or scalping to mineral soil a five-foot radius around each seedling/sapling. Release treatments could involve up to two entries over the project implementation period (ten years). Approximately 30 acres are proposed for release.

Roads and Landings

No new or reconstructed Forest System roads are proposed for this project. Approximately 1.5 miles of temporary roads are proposed for construction. The temporary roads will be restored to a near natural condition after project activities have been completed. Temporary roads will be generally short segments of approximately 0.1 mile in length with the longest segment approximately 0.2 mile.

There will be approximately 6.3 miles of pre-haul road maintenance. Road maintenance activities will include: roadside brushing; installing or maintaining waterbars or rolling dips; grading; rocking; cleaning ditches and culverts; and removing small trees and limbs that interfere with traffic and/or visible sight distance around curves. Water will be used for dust abatement on roads during timber hauling activities. The water drafting site will be located on Sheep Thief Creek at the intersection of the Stump Springs Road (7S05) and Huntington Lake Road. If other sites are used, they will comply with the design features for the project. Other methods of dust abatement, such as SC-290 oil, may be considered as an alternative to using water as long as the use is in compliance with the design features.

Landings will be included in the commercial treatment units located at the end of the temporary road segments or adjacent to Forest System roads.

Implementation Schedule

The project is proposed for implementation over a ten year period, beginning in 2012. The schedule of activities will likely occur in the following order:

1. Temporary road construction and pre-haul road maintenance.
2. Commercial harvest treatments.
3. Precommercial thinning treatments.
4. Fuel reduction treatments.
5. Reforestation treatments.

Non-significant Project Level Forest Plan Amendment



Figure 2. Severely diseased tree within the project area.

dead foliage). While not currently hazardous, these predictors strongly indicate tree mortality in the next ten years. This Forest Plan amendment is non-significant because it is anticipated that less than 20 trees will be involved.

The proposed action requires a non-significant Forest Plan amendment. There are large live overstory trees in portions of stand 60 (23 acres) adjacent to structures: these trees have indicators of severe disease leading to mortality or instability (figure 2 is an example of a tree that would likely fit this category). These severely diseased trees are proposed for removal using the sanitation prescription in the proposed action; they presently do not meet the definition of a hazard tree. The 2004 Sierra Nevada Forest Plan Amendment, standard and guideline 6 will be modified to state, "For all mechanical thinning treatments, design projects to retain all live conifers 30 inches dbh or larger. Exceptions are allowed to meet needs for equipment operability **and to allow the removal of live diseased trees within Keola Project treatment unit 60 greater than 30 inches dbh based on the mortality risk predictors developed by the Forest Service silviculturist, entomologist and pathologist.**"¹ It is anticipated all of these trees greater than 30 inches dbh will be severely diseased and slow growing firs with obvious signs of poor crown vigor (e.g., yellow needles, ragged crowns, thin and wispy crowns, high mistletoe infection, and high percentage of

¹ The "bolded" portion is the proposed amendment to the standard and guideline.

Table 2. Summary of activities by treatment unit for the proposed action alternative.²

Treatment Unit #	Total Acres	No Treatment	Single Tree Selection	Thin from Below	Sanitation	Sporax® stumps	Precommercial Thin	Masticate	Hand Pile	Tractor Pile	Burn Piles	Broadcast Burn	Site Preparation Tractor	Planting	Release	Temporary Roads (miles)
42	30	5		25		25	25			25	25			0.5	1.5	0.1
43	21					21	21	21			21				1.0	
44	20	2		18		18	18			18	18			0.5	0.7	0.2
45	26	5	21			21	21	21							4.0	
47	27											27				
48	26			25		25	25					26	1.0	1.0	2.5	
50	87	5	82			82	82			82	82			3.0	6.5	0.5
51	13	4		9		9	9			9	9				2.0	
52	20	1		1		19	19	19						1.0	3.0	0.1
53	22											22				
54	9			9		9				9	9					0.1
55	30											30				
56	4											4				
57	26											26				
59	33	2		31		31	31			31	31			1.0	2.0	
60	31		8	23		31	31	23		8	31			2.5	4.0	0.1
65	108	2	106			106	106			106	106			1.0	1.5	0.3
115	4											4				
126	13		13			13	13			13	13			0.5	1.0	0.1
total	550	26	103	245	23	389	401	40	44	301	345	139	1.0	11.0	29.7	1.5

² All measurements are in acres except temporary road measurements are in miles.

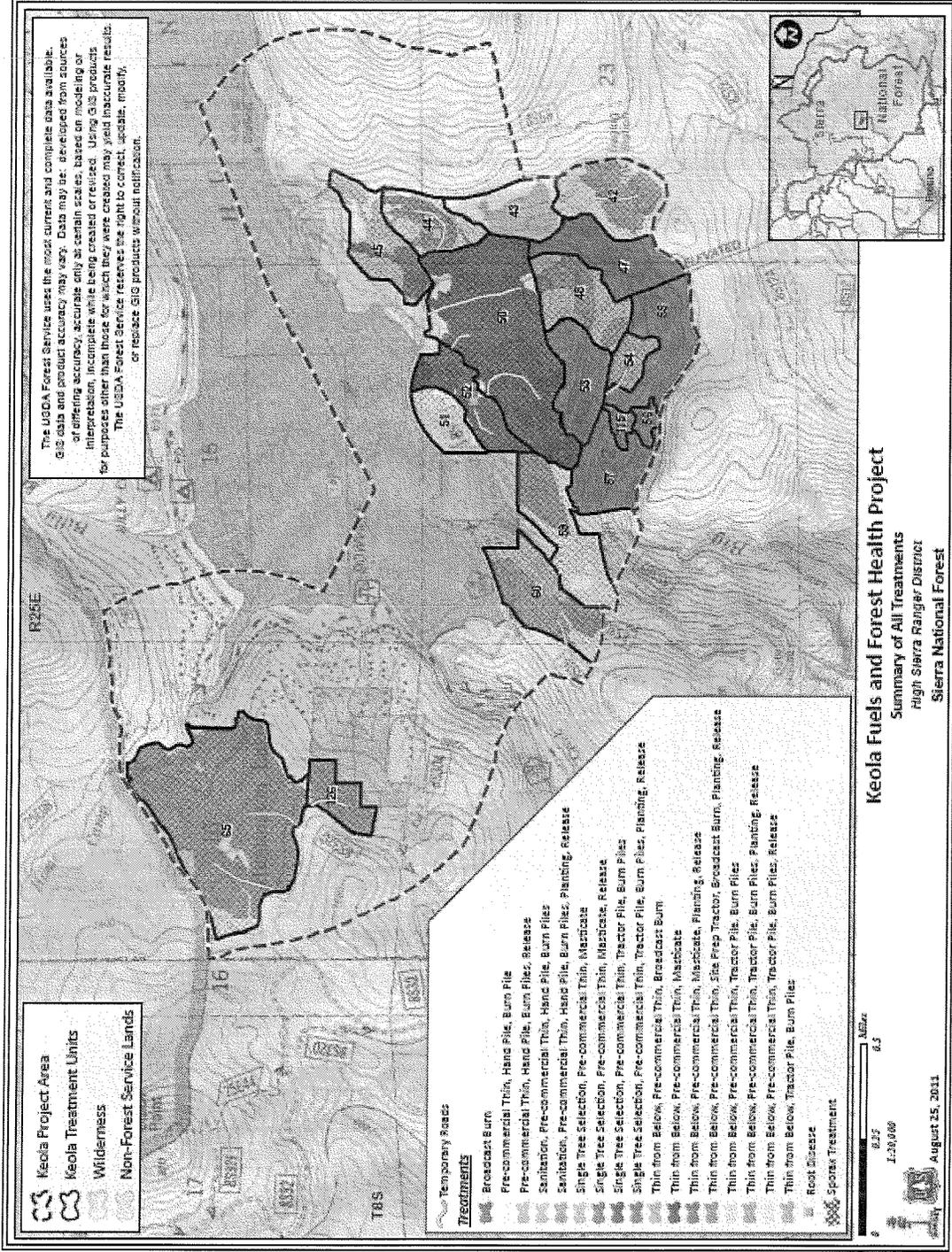


Figure 1. Alternative 2, Proposed Action Treatment Map.

Design Features

To minimize adverse impacts to resources in the project area from this project, the following design features are incorporated into the project. They are broken into resource groups but many of these features can reduce impacts to other resources. All design features pertain to both alternatives 2 and 3 (unless noted otherwise). Those design features that are based on Forest Plan standard and guidelines are referenced as such.

Visuals Resources

- VIS-1 To provide visual screening, maintain a vegetation buffer between the lakeshore and forest road 8S66 or a 25-foot vegetation buffer, whichever is greater. The vegetation buffer would remain untreated except hazardous trees would be removed.
- VIS-2 Forest Landscape Architect would be consulted during implementation of the precommercial thinning activities in units 60 and 65 to ensure proper visual screening around the recreation cabins, Huntington Lake Resort, and Camp Keola.
- VIS-3 Construct temporary roads in a manner that closely duplicates the existing contour lines, with a minimum degree of landform alteration limiting the amount of earthwork. Avoid excessive cut and fill slopes for road construction. Avoid straight linear road construction. Design and construct temporary roads so that they will not be highly visible from key viewing points (i.e., **cabins, Huntington Lake Resort, Camp Keola, residences, recreation facilities, Huntington Lake, Huntington Lake Road, Sierra Heritage Scenic Byway**) or the main arterial roads. Use BMPs and avoid rock outcrops or sensitive areas. Upon completion, where the road access is no longer necessary to implement the project, the temporary roads will be closed and restored using native seed/vegetation.
- VIS-4 Where feasible, locate burn piles in areas where they would not be highly visible from the key viewing points noted under VIS-3. Piles within 300 feet of these key viewing points should burn with more than 90 percent consumption. If 90 percent consumption is not reached (and the remaining fuels still meet the fuels objectives), the remnant slash will be scattered throughout the site. These piles are anticipated to be burned within three years.
- VIS-5 Restrict landing to existing openings when possible. Minimize landing sizes and locate landings where they would not be highly visible from the key viewing points noted under VIS-3. Do not locate landings perpendicular to main arterial roads when possible to eliminate direct views into landings from these roads.
- VIS-6 Tree stumps that are highly visible (i.e., within view of a 300-foot distance) from the key viewing points noted under VIS-3, will be cut to a maximum of 6-inch heights or as low as possible from the uphill side. Tree stumps that are highly visible within unit 60 (i.e., within view) from the cabins and Camp Keola will be flush cut to a maximum of 3-inch heights or as low as possible from the uphill side so that the tree stumps are not visually evident.

- VIS-7 In those areas where skid trails are highly visible from the key viewing points noted under VIS-3, the skid trails will be rehabilitated so that they are not visually evident from the key viewing points within three years.
- VIS-8 Firelines will follow natural contours whenever possible. Underburns will be conducted to produce low intensity fire to minimize mortality to the overstory. While meeting the fuels objectives in the broadcast burn units of shrub species, retain islands of unburned vegetation in those areas to increase visual interest and attract wildlife. The edges of the islands will be feathered and undulated to create a near-natural appearance.
- VIS-9 Tree marking (painting) and flagging should be done in a manner that screens these indicators from view of the key viewing points noted under VIS-3.

Wildlife

General Wildlife

- WLD-1 The District biologist will be consulted prior to any marking for removal of severely diseased trees greater than 30-inch dbh.
- WLD-2 To avoid attracting opportunistic predators such as coyotes, domestic and feral dogs and cats, opossums, skunks and raccoons, all food and trash must be appropriately stored in closed containers and removed from the project site at the end of each day.
- WLD-3 Where feasible and still meeting safety and fuels objectives, retain an average of four (in mixed conifer) to six (in red fir forest type) of the largest snags (greater than 15-inch dbh) per acre across the project area (SNFPA ROD standard and guideline 11, pp. 51-52).
- WLD-4 Slash / brush piles shall be ignited using a pattern that allows animals to escape the fire. For example, piles will be lit at one end or an area will be left unignited which will serve as an escape route.

Special Status Terrestrial Wildlife

- WLD-5 Mechanical treatments may be conducted to meet fuels objectives in protected activity centers (PACs) located in WUI defense zones. Mechanical treatments should be designed to maintain habitat structure and function of the PAC (SNFPA ROD standard and guideline 72, p. 60).
- WLD-6 Within all PACs, prioritize maintaining canopy cover over restoration treatments. Conduct restoration treatments described in the vegetation treatment prescription when they are consistent with maintaining PAC objectives of canopy cover and protecting the nest site buffer.
- WLD-7 Conduct surveys in compliance with the Pacific Southwest Region's survey protocols during the planning process when vegetation treatments are likely to reduce habitat quality are proposed in suitable northern goshawk nesting habitat that is not within an existing California spotted owl or northern goshawk PAC. Suitable northern goshawk nesting habitat is defined based on the survey protocol (SNFPA ROD standard and guideline 33, p. 54).

- WLD-8 Mechanical treatments are prohibited within a 500-foot radius buffer around a spotted owl activity center within the designated PAC for treatments in WUI defense zones. Prescribed burning is allowed within the 500-foot radius buffer. Hand treatments, including handline construction, tree pruning, and cutting of small trees (less than 6 inches dbh), may be conducted prior to burning as needed to protect important elements of owl habitat. Treatments in the remainder of the PAC use the forest-wide standards and guidelines for mechanical thinning (SNFPA ROD standard and guideline 73, p. 60).
- WLD-9 Maintain a limited operating period (LOP) for California spotted owls, prohibiting vegetation treatments within approximately 0.25 mile of the activity center during the breeding season (March 1 through August 15), unless surveys confirm that California spotted owls are not nesting (SNFPA ROD standard and guideline 75, p. 60). Prior to implementing activities within or adjacent to a California spotted owl PAC and the location of the nest site or activity center is uncertain, conduct surveys to establish or confirm the location of the nest or activity center.
- The LOP may be waived for vegetation treatments of limited scope and duration, when a biological evaluation determines that such activities are unlikely to result in breeding disturbance considering their intensity, duration, timing and specific location. Where a biological evaluation concludes that a nest site would be shielded from planned activities by topographic features that would minimize disturbance, the LOP buffer distance may be modified (SNFPA ROD standard and guideline 77, p. 60).
- WLD-10 Breeding season limited operating period restrictions may be waived, where necessary, to allow for use of early season prescribed fire in up to 5 percent of California spotted owl PACs per year on a forest (SNFPA ROD standard and guideline 78, p. 61).
- WLD-11 Conduct vegetation treatments in no more than 5 percent per year and 10 percent per decade of the acres in California spotted owl PACs in the 11 Sierra Nevada National Forests. Monitor the number of PACs treated at a bioregional scale (SNFPA ROD standard and guideline 80, p. 61).
- WLD-12 Apply a limited operating period (LOP), prohibiting vegetation treatments and road construction within 0.25 mile of an active great gray owl nest stand, during the nesting period (typically March 1 to August 15). The LOP may be waived for vegetation treatments of limited scope and duration, when a biological evaluation determines that such projects are unlikely to result in breeding disturbance considering their intensity, duration, timing and specific location. Where a biological evaluation concludes that a nest site would be shielded from planned activities by topographic features that would minimize disturbance, the LOP buffer distance may be reduced (SNFPA ROD standard and guideline 83, p. 61).
- WLD-13 Protect fisher den site buffers (700 acres) from disturbance with a limited operating period (LOP) from March 1 through June 30 for vegetation treatments as long as habitat remains suitable or until another Regionally-approved management strategy is implemented. The LOP may be waived for individual activities of limited scope and duration, when a biological evaluation documents that such projects are unlikely to result in breeding disturbance considering their intensity, duration, timing, and specific location (SNFPA ROD standard and guideline 85, p. 61).

- Proposed treatments of low intensity and duration such as planting, hand release, hand thinning, and hand piling can occur during the LOP.

- WLD-14 Avoid fuel treatments in fisher den site buffers to the extent possible. If areas within den site buffers must be treated to achieve fuels objectives for the urban wildland intermix zone, limit treatments to mechanical clearing of fuels. Treat ladder and surface fuels to achieve fuels objectives. Use piling or mastication to treat surface fuels during initial treatment. Burning of piled debris is allowed. Prescribed fire may be used to treat fuels if no other reasonable alternative exists (SNFPA ROD standard and guideline 86, p. 61).
- WLD-15 In the Southern Sierra Fisher Conservation Area, design measures prior to vegetation treatments to protect important habitat structures for fisher as identified by the wildlife biologist, such as large diameter snags and oaks, patches of dense large trees typically 0.25 to 2 acres, large trees with cavities for nesting, clumps of small understory trees, and coarse woody material. For example, use firing patterns, place fire lines around snags and large logs, and implement other prescribed burning techniques to minimize effects to these attributes. Use mechanical treatments over prescribed fire, when appropriate, to minimize effects on preferred fisher habitat elements (SNFPA ROD standard and guideline 90, p. 62).
- WLD-16 Retain all oaks unless they are a hazard to operations or public.
- WLD-17 Protect marten den site buffers from disturbance from vegetation treatments with a limited operating period (LOP) from May 1 through July 31 as long as habitat remains suitable or until another Regionally-approved management strategy is implemented. The LOP may be waived for individual projects of limited scope and duration, when a biological evaluation documents that such projects are unlikely to result in breeding disturbance considering their intensity, duration, timing, and specific location (SNFPA ROD standard and guideline 88, p. 61).

General Special Status³ Terrestrial and Aquatic Wildlife

- WLD-18 Avoid establishing landings or staging areas within special status species occupied suitable habitats and riparian areas.
- WLD-19 If any newly listed or unknown occurrence of special status species is found within the affected project area during project preparation or implementation, work will stop in the area and the District biologist will be contacted immediately to determine appropriate action. Additional species protection measures may be required.
- WLD-20 Within Streamside Management Zones (SMZ) associated with special status, suitable or occupied aquatic/riparian species habitat, the following protection measures will be implemented. (Prior to applying these protection measures, review species specific areas since extended protection zones may need to be applied beyond the SMZ boundaries.)
- a. Tractor ground skidding, landing construction, tractor slash piling, skid trail construction, and end-lining are prohibited.

³ Special status species are federally listed (threatened, endangered, candidate) and Forest Service sensitive species.

- b. Stream bank trees and trees within riparian vegetation of occupied or suitable special status habitat are not to be removed from the site (i.e., drop and leave on site) unless field reviewed and approved by the Aquatic Biologist.
- c. Removal of trees within a SMZ can occur if work can be accomplished from an existing Forest System road, and no soil disturbance occurs while implementing activities. If soil is disturbed during tree removal, project activities in the SMZ must stop immediately and rehabilitation work will be completed after consultation with the District Aquatic Biologist and Hydrologist. If any of these guidelines cannot be achieved, fall and leave in place.

Aquatic Wildlife

- WLD-21 Design prescribed fire treatments to minimize disturbance of ground cover and riparian vegetation in Riparian Conservation Areas (RCA). In burn plans for project areas that include, or are adjacent to RCAs, identify measures to minimize the spread of fire into riparian vegetation (SNFPA ROD standard and guideline 111, p. 64).
- WLD-22 Report any discovery of amphibians (frogs or salamanders) or reptiles (turtles) during project preparation or implementation to the District Fisheries/Aquatic biologist.
- WLD-23 Stream drafting will follow the following guidelines:

- a. Water drafting candidate sites should be selected by the Sale Administrator and approved by the Hydrologist and Aquatic Biologist.
- b. Water drafting sites should be at least 500 feet to 0.6 miles away from occupied aquatic species habitat (as determined by the Aquatic Biologist) (SNFPA ROD standard and guideline 92, 96, 103, 101, 110; BMP 2-21).

Stream drafting requirements noted below will be monitored by the District Hydrologist or Aquatic Biologist:

- a. Drafting sites shall be visually surveyed for frogs and their eggs before drafting begins.
- b. Use a screened intake device and pumps with low entry velocity and suction strainers with screen less than 2 millimeter (1/8 inch) in size to minimize removal of aquatic species, including juvenile fish, amphibian egg masses and tadpoles, from aquatic habitats (SNFPA ROD Standard 110).
- c. The suction strainer shall be inserted close to the substrate in the deepest water available and placed in a canvas bucket to avoid substrate and aquatic species disturbance.
- d. Allow no drafting unless immediate downstream discharge from drafting site is maintained at 1.5 cubic feet per second or greater (SNFPA ROD standard and guideline 43; BMP 2-21).
- e. Permit water drafting to remove no more than 50 percent of any stream's ambient discharge that is over 1.5 cubic feet per second (SNFPA ROD standard and guideline 43; BMP 2-21).

- WLD-24 Where treatments are proposed in habitat for special status aquatic species, only use water for dust abatement within RCAs.

- WLD-25 Protect any seeps, springs, bogs, fens, and/or wet areas that may be found during project implementation that are not already identified on project analysis maps. Treat these areas as perennial areas with 300-foot RCA and 100-foot no equipment buffer. Manage activities, within RCA/SMZ areas, according to the following protection measures:
- a. Within canyons (e.g., adjacent perennial stream), maintain highest relative canopy density to contribute to maintaining water temperature (SNFPA ROD standard and guideline 96, p. 63).
 - b. Locate refueling sites and oil and fuel storage outside of RCA/SMZ areas, except at designated administrative sites and sites covered by special use permit. Refueling may be allowed within RCA/SMZ areas when there are no other alternatives (locations must be approved by the District Hydrologist). Ensure that spill plans are reviewed and up-to date (SNFPA ROD standard and guideline 99, p. 63).
 - c. Maintain all non-hazardous snags and downed logs within RCA/SMZ areas to contribute to current and future large woody debris, except for areas within 300 feet of a public and firefighter safety zone (SNFPA ROD standard and guideline 108, p. 64).
 - d. When broadcast burning in RCA/SMZ areas, stop ignition within 100 feet of the stream or aquatic feature and allow fire to back down into the area (SNFPA ROD standard and guideline 111, p. 64).
 - e. Do not allow mechanical equipment within 100 feet of meadows, perennial streams, or other special aquatic features (SNFPA ROD standard and guideline 113, p. 64). Do not allow mechanical equipment within the SMZs.
 - f. All hand piles will be located a minimum of:
 1. Perennial streams: 100 feet from streambanks.
 2. Seasonal streams: 50 feet from streambanks.
 - g. To protect bank stability, do not cut stream bank trees (tree with drip line extending to or over stream bank). Do not cut or otherwise treat any riparian dependant vegetation unless approved by the District Aquatic Biologist. Along perennial streams and wet meadows, leave 50 feet closest to the edge of the aquatic feature untreated (SNFPA ROD standard and guideline 113, p. 64).
 - h. Avoid locating skid trails or landings in hydrologic or topographic depressions to minimize the concentration of water. Designate any temporary roads or crossings needed within RCA/SMZ areas. Restore temporary road areas before the winter season or if the temporary road(s) will be used beyond one field season, construct temporary erosion control structures (e.g., waterbars) for the winter season (SNFPA ROD standard and guideline 113, p. 64).
- WLD-26 Follow and monitor all Best Management Practices (BMPs), noted in appendix A, related to Sporax[®] application procedures. If Sporax[®] is to be applied within a SMZ, the District Fisheries/Aquatic biologist will need to be consulted prior to application.

Botany (Forest Service Sensitive Plant Species)

- BOT-1. Identify, flag, and avoid areas with sensitive plants prior to performing mechanical treatments. Temporary roads, skid trails, tractor lines, landings and other heavy equipment activity will be located away from sensitive plant occurrences with a minimum of a 50-foot buffer.
- BOT-2. An adaptive management strategy will be utilized in areas where sensitive species and invasives co-occur in the prescribed fire units. A test area will be permitted to be treated with prescribed fire and will be monitored the following year. If monitoring shows that there are no detrimental impacts to invasive spread or to the sensitive species, it shall be allowed throughout the planned units. If monitoring results show adverse impacts to invasive weed spread or to sensitive species, prescribed fire will be prohibited within 100 feet of the sensitive or invasive plant occurrence.
- BOT-3. Pile burning will not be conducted in areas with sensitive plant occurrences.
- BOT-4. All seeps, springs and riparian areas identified as having suitable habitat for sensitive plant species shall be excluded from project associated activities with a 25-foot buffer. If these areas are identified during implementation as critical treatment or access areas, pre-implementation surveys will occur during the appropriate phonological identification period (usually late summer, early fall).
- BOT-5. Extend design features to any newly discovered populations of sensitive or special interest plants (after completion of the biological evaluation or environmental assessment) found before or during project implementation.
- BOT-6. The contract administrator or project manager will consult with Forest botanical staff prior to project implementation to ensure appropriate buffers and flagging is in place.

Invasive Plants

- WEED-1. All off-road equipment used on this project would be washed before moving into the project area to ensure that the equipment is free of soil, seeds, vegetative material, or other debris that could contain or hold seeds of noxious weeds. For contracts, use equipment cleaning contract provisions WO-C/CT 6.36. When working in known weed infested areas, equipment would be cleaned before moving to other areas which do not contain noxious weeds.
- WEED-2. All earth-moving equipment, gravel, fill, or other materials used for road maintenance and culvert construction are required to be weed-free. Use onsite sand, gravel, rock, or organic matter when possible. Otherwise, obtain weed-free materials from gravel pits and fill sources that have been surveyed and approved by a Forest botanist, noxious weed coordinator, or ecologist or the interagency mineral materials group headed up by Yosemite National Park.
- WEED-3. Use weed-free mulches, and seed sources. All activities that require seeding or planting must utilize locally collected native seed sources as per the Region 5 Native Plant Policy. Any seeding and planting must be pre-approved by a Forest Service botanist.

- WEED-4. Fuel piling and pile burning would be prohibited in areas with weed infestations.
- WEED-5. Prior to project implementation, all known noxious weed populations within treatment units except cheat grass would be treated (i.e., manually pulled) before plants flower, or flagged and avoided. A Forest Service botanist will be consulted prior to project implementation for a species specific prescription if new infestations of invasive species are detected during implementation.

Areas identified as having infestations of intermediate wheatgrass will be pretreated each year prior to project implementation by removing and bagging seedheads for offsite disposal, or by mowing to prevent seed production.

- WEED-6. Monitoring of invasive plant occurrences will continue for at least three years post-project implementation. If invasive plant occurrences are found to be expanding beyond pretreatment levels as a result of project activities, or if new occurrences are identified, eradication efforts will be undertaken.
- WEED-7. Staging areas for equipment, materials, or crews or landings will be placed outside of areas with weed infestations.
- WEED-8. When use of landings and staging areas is completed, native vegetation would be reestablished through planting native seeds to minimize weed establishment and infestation on landings and staging areas within 100 feet of noxious weed infestations if determined necessary by Forest Service botanist.

Soils

- SOIL-1. Limit mechanical piling and skidding operations to slopes less than 35 percent (LMP standard and guideline 125, p. 4-20). Any treatment units over 35 percent slopes will have to be grapple or hand piled.
- SOIL-2. Avoid mixing or removing soils below the A horizon in treatment areas (excluding roads, skid trails, and landings). On slopes less than 35 percent, maintain an average effective ground cover of 50 percent. On slopes greater than 35 percent, maintain an average effective ground cover of 70 percent (LMP standard and guideline 130, p. 4-21).
- SOIL-3. During mechanical treatments, leave a 100-foot wide buffer of 100 percent soil cover (or the existing cover if less than 100 percent) below large rock outcrops. These areas have a potential to generate runoff that can cause accelerated erosion on soils down slope. During prescribed burns, employ firing patterns to minimize impacts on soil cover in these areas.
- SOIL-4. Apply appropriate erosion prevention measures on all ground disturbing activities prior to fall storms (October 1) and immediately upon completion of activity begun after November 1 (LMP standard and guideline 127, p. 4-21).
- SOIL-5. For treatments in areas greater than 300 feet from structures, retain an average of five well distributed logs per acre. Each log will be a minimum of 12 inches in diameter and 10 feet long.

Water Resources

HYD-1 Implement Riparian Conservation Areas (RCAs)⁴ adjacent to streams and other aquatic features according to the following standards noted in table 3:

Table 3. RCA and SMZ widths based on aquatic feature (SNFPA ROD), standard and guideline 91, p. 62).

Aquatic Feature	RCA Width
Perennial Streams	300 feet each side, as measured from the bank full edge
Seasonally Flowing Streams	150 feet each side, as measured from the bank full edge
Streams in Inner Gorge ¹	Top of the inner gorge
Special Aquatic Features ² and perennial streams with riparian vegetation extending more than 150 feet from the stream, or seasonally flowing streams with riparian conditions extending more than 50 feet from the stream	300 feet from the edge of the feature or the edge of the riparian vegetation, whichever is greater
Other hydrologic or topographic depression	None

¹ Inner gorge is defined by stream adjacent slopes greater than 70 percent

² Special aquatic features include: lakes, wet meadows, bogs, fens, wetlands, vernal pools, and springs (Sierra Nevada Forest Plan Amendment Record of Decision (SNFPA ROD), Standard 91, page 62)

HYD-2 Stream Class is used to determine the width of the SMZ, which is a zone managed primarily to protect and maintain water quality, site productivity, channel stability, wildlife habitat, and riparian vegetation.⁵ The SMZs are nested within the RCAs. These widths are defined as:

- Class I - 100 feet plus 3 feet for each percent side slope above 30 percent.
- Class II - 75 feet plus 3 feet for each percent side slope above 30 percent.
- Class III - 50 feet plus 3 feet for each percent side slope above 30 percent.
- Class IV - 25 feet plus 3 feet for each percent side slope above 30 percent.
- Class V - No special protection required.

HYD-3 Best Management Practices (BMP) are a range of management practices used by the Forest Service to protect water quality. Implement appropriate BMPs (which are identified in the water resource report and appendix A of this document) (LMP standard and guideline 124, p. 4-20).

⁴ Riparian Conservation Areas are a key component of the Aquatic Management Strategy and are designed to establish management zones around aquatic features.

⁵ Streamside Management Zones (SMZs) are based on direction in the Sierra National Forest Land Management Plan and are intended to manage project activities within RCAs (LMP standard and guideline 70, page 4-17). Stream Classes are established in the Soil and Water Conservation Handbook (FSH2509.22), Sierra NF Supplement 1 (1989).

Private Land and Special Uses

- PVT-1 In areas where work is being completed near special use permit structures, provide permit holders the ability to comment on the completeness of the work before the contract is closed. A recreational residence representative for each tract will serve as a contact to the district.
- PVT-2 During the implementation of this project, special use improvements (e.g., water systems) will be protected from project activities to reduce potential damage to the physical improvements and the function of those improvements. Any damage to or function of the improvements will be the responsibility of the contractor.
- PVT-3 The Forest Service will provide additional information to special use permit holders (e.g., recreation cabin, resorts, camps) and private residents in Huntington Basin regarding proper hazardous fuel treatments to reduce wildfire risk while preventing erosion or other resource concerns.
- PVT-4 Advanced notification will be provided to potentially impacted special use holders prior to implementation (e.g., cabin, resort, camp owners; SCE), including potential activities that could directly impact the improvement (e.g., power distribution lines).
- PVT-5 Pile burning near structures would occur during the low-use recreation season (May 15 through Labor Day Weekend).
- PVT-6 Prior to implementing the project near private lands, landlines will be flagged to ensure that trespass is avoided.
- PVT-7 Ensure legal access on existing roads through private lands has been acquired before project implementation.

Cultural/Heritage Resources

Project implementation would comply with the stipulations of the *First Amended Regional Programmatic Agreement Among the USDA Forest Service, Pacific Southwest Region, California State Historic Preservation Officer, and Advisory Council on Historic Preservation Regarding the Process for Compliance with Section 106 of the National Historic Preservation Act for Undertakings on the National Forests of the Pacific Southwest Region* (Regional Programmatic Agreement), dated 2001. This project meets Stipulations III.C.(2) and III.D.(3), Undertakings Where Management Measures Are Necessary for the Protection of Historic Properties.

- CR-1 Prior to initiating ground disturbing activities, contact the District Archaeologist to ensure appropriate protection measures for cultural resource sites are in place and understood.
- CR-2 Avoid historic properties with ground disturbing activities (i.e., the use of ground-based mechanical equipment, planting, piling, fire-line construction, temp road construction, etc.), in accordance with the Standard Protection Measures (Attachment B) of the Regional Programmatic Agreement. Typical implementation of the Standard Protection Measures is the practice of “flag-and-avoid” (Measure I.B.).

- CR-3 Allow certain non-ground disturbing activities within historic property boundaries: Certain proposed activities lack the potential to adversely affect the character of historic properties. Implementation of these activities would help reduce the isolation of a site from its surroundings and is consistent with the Regional Programmatic Agreement:
- Archaeological resources may not be resources at risk of effects from underburning (in accordance with the provisions of the Regional Programmatic Agreement *Interim Protocol for Non-Intensive Inventory Strategies for Hazardous Fuels and Vegetation Reduction Projects*). The standard resource protection measures of the Interim Protocol would be applied only to those historic properties defined as “at-risk” from the use of prescribed fire treatments.
 - Mechanical shredding of fuels inside of site boundaries with an articulated boom shredder/harvester would not affect the archaeological materials, provided the tracked or wheeled equipment stays outside of the delineated site boundary and the machine head does not contact the ground surface or site features (Interim protocol, Measure V.B.11.). Removal of fuels by hand (manual thinning with chainsaws) would not affect archaeological materials (Attachment A, II.C.).
 - Chemical applications for disease prevention (i.e., Sporax[®]) would not affect historic properties where the application meets the intent of the Regional Programmatic Agreement Stipulation III.E, specifically Attachment A, II.E, application of pesticides that do not have the potential to affect access to or use of resources by Native Americans.
- CR-4 Non-Archaeological Cultural Resources: Traditional cultural properties, locations of contemporary Native American gathering, and other such cultural resources identified through consultation with Native American tribes and individuals would be protected through avoidance by project activity, or managed through project implementation and consultation to enhance the resource. For example, planned prescribed fire can have positive effects to regenerate growth in certain plant species used by Native Americans in basketry or traditional food preparation.
- CR-5 In the event of inadvertent effects or new discovery during implementation, the Forest would comply with the stipulations of the Regional Programmatic Agreement.
- CR-6 Forest Heritage Staff shall provide written approval for actions by special use permit holders that may have an effect on historic landscape characteristics associated with historic structures, including maintenance of surrounding landscaping and adding vegetation (planting), per the Regional Programmatic Agreement.

Air Quality

- AIR-1 Conduct dust abatement practices along native surfaced roads and landings to reduce fugitive dust impacts on air quality.

The following are best available control measures (BACMs) for prescribed fire as required under Section 190 of the Clean Air Act, as amended in 1990.⁶ Specific techniques to reduce fire emissions include the following:

- AIR-2 Conduct a full conformity analysis, as required by the Clean Air Act and the State Implementation Plan (SIP) to assess whether the proposed action produces less than de minimis emissions.
- AIR-3 Ensure that all activities conform to the SIP.
- AIR-4 Provide timely information about prescribed burning activities, the potential for smoke impacting residents and visitors and actions people can take to protect themselves from smoke through local communications sources.
- AIR-5 Employ avoidance techniques such as burning on cloudy days when the plume and residual smoke cannot be seen, burning during periods of atmospheric instability for better smoke dispersal, and burning during periods of low visitor use.
- AIR-6 Avoid prescribed burning periods when smoke inversion layers are predicted and would adversely affect recreation residence occupants, docks, resorts, and adjacent communities.
- AIR-7 Employ commonly used reduction techniques such as burning units after harvest before new live fuels appear; burning in the springtime prior to “green-up,” burning when 1,000-hour fuels (woody debris larger than 3 inches in diameter) moistures are high, and burning when the duff is wet (after fall precipitation, or during winter and spring).
- AIR-8 Employ techniques to optimize flaming combustion, including burning piled fuels rather than broadcast burning, reducing the amount of soil in piles, and employing rapid ignition to create a high intensity fire.

Monitoring

The following are monitoring elements specific to this project. They are applicable to both action alternatives unless stated otherwise:⁷

⁶ The U.S. Environmental Protection Agency (EPA) developed implementation strategies and BACM for areas that are designated serious non-attainment for particulate matter less than 10 microns (PM10) in 1992.

⁷ Information gathered before, during and after implementation of activities is used to ensure that the project was implemented as planned and to determine the effectiveness of the project’s design and associated design features. It provides a feedback mechanism not only for this project but for similar projects planned in the future. Monitoring is completed at recurring intervals as a basis for Forest Plan implementation. Project effectiveness monitoring is completed by routine sampling specific projects at specified time intervals.

Vegetation

- A sample of trees which meet the severely diseased guidelines, but do not pose a threat to improvements even if they become snags, will be monitored within the Huntington Lake Recreational Area. The trees will be revisited in 5 years to assess the accuracy of the guidelines. A sample of trees which have some signs of poor vigor but do not meet the guidelines for removal will also be monitored and revisited in 5 years. This monitoring will calibrate the guidelines for future use. (Specific to alternative 2.)
- All known annosum root disease pockets will be revisited within 5 years after treatment to assess the effectiveness of treatments in preventing further spread of the disease.
- Plots will be staked and measured within planted areas to determine 1-year, 3-year and 5-year survival and stocking in compliance with National Forest Management Act. Plots will use the Forest Service, Pacific Southwest Region standard of staked tree plots. (Specific to alternative 2.)

Visual Resources

- The Forest Landscape Architect will monitor the implementation of the precommercial thinning activities in units 60 and 65 to ensure proper visual screening around the recreation cabins, Huntington Lake Resort, and Camp Keola.

Fuels

- All fuel reduction treatment activities throughout the project area will be monitored and documented within the unit folders to document fuel treatment effectiveness after implementation. All monitoring will include pre- and post-photos, pre and post-ocular estimation of fuel loading, and if resource objectives have been met with regards to the overall change in surface fuel modification.

Wildlife

- Monitor for California spotted owls, PAC FR113 prior to project implementation.
- Pre-treatment survey will occur for goshawks in suitable habitat.

Aquatic Wildlife

- Monitoring of stream drafting requirements listed in design feature WLD-23 will occur during project implementation by the District Hydrologist or Aquatic Biologist. This includes conducting visual surveys for frogs and eggs prior to drafting activities.

- Surveys to determine effectiveness of design features will be required after project activities are complete for any special status aquatic species that are known to occur or are found to occur during project implementation in treatment units.
- Any seeps, springs, bogs, fens and/or wet areas will be monitored during project implementation to ensure required protection measures are being met.

Invasive Plants

- Monitor disturbed areas for invasive plants two years after vegetation treatments occur in a unit. Promptly remove any invasive weeds found to stop seed set. Continue monitoring these infected areas as necessary to eradicate new occurrences.

Hydrology/Soils

- Random sampling is utilized for the Best Management Practice Evaluation Program monitoring (USFS 2002) that observes hillslope conditions focusing on erosion and sedimentation following implementation as well as effectiveness of the measures implemented at least one winter season after implementation. Implementation is verified by the contract administrator for all units. In addition, each unit is included in various sample pools and has potential to be randomly selected for effectiveness monitoring.

Heritage

- According to the Regional Programmatic Agreement, the Forest shall conduct monitoring to ensure the effectiveness of the protection measures or prevent the loss of unidentified cultural resources. Heritage Resource Managers would determine the schedule and requirements for any monitoring based on the timing of project implementation; the type of project activity; and locations of known cultural resources. Monitoring results would be documented in the Sierra National Forest's annual Regional Programmatic Agreement report.

Air Quality

- Smoke monitoring and impacts to the public will occur through feedback from local residences and or recreationists.
- Smoke columns and drift will be visibly monitored for transport and dispersion to minimize impacts to forest visitors and communities and documented within the site specific burn plan.

APPENDIX A, BEST MANAGEMENT PRACTICES

Implementation of BMPs are included in the Keola Fuels and Forest Health Project in order to meet applicable standards and guidelines for watershed resources (Forest Plan standard and guideline 124).

Implement Best Management Practices (BMPs) as described below.

BMP Name, Objective, and Direction	Application to the Keola Project	Project Phase
<p>BMP 1-1 Timber Sale Planning Process: To incorporate water quality and hydrologic considerations into the timber sale planning process.</p>	<p>Implemented through the Riparian Conservation Objectives/Forest Plan Consistency report, specification of operational BMPs, Environmental Analysis including interdisciplinary team office and field discussions, and incorporation of water quality protection measures in the Timber Sale Contract for the Keola Project.</p>	<p>Planning</p>
<p>BMP 1-4 Use of Sale Area Maps (SAM) and/or Project Maps for Designating Water Quality Protection Needs: To ensure recognition and protection of areas related to water quality protection delineated on a SAM or project map.</p>	<p>The sale administrator and purchaser will review these areas on the ground prior to commencement of ground disturbing activities. Examples of water quality protection features that will be designated on the project map include:</p> <ol style="list-style-type: none"> 1) Location of stream courses and riparian zones to be protected, including the width of the protection zone for each area. 2) Wetlands (meadows, lakes, springs, etc.) and other sensitive areas (such as shallow soils) to be protected. 3) Boundaries of harvest units, specified roads and roads where hauling activities are prohibited or restricted, areas of different skidding and/or yarding methods, including post-harvest fuels treatments, and water sources available for purchaser's use. 	<p>Timber Sale Contract</p>
<p>BMP 1-5 Limiting the Operating Period of Timber Sale Activities: To ensure that the purchasers conduct their operations, including erosion control work, road maintenance, and so forth, in a timely manner, within the time frame specified in the Timber Sale Contract.</p>	<p>The purchaser's contract operation period will be limited to contract-specified periods when adverse environmental effects are not likely. The Sale Administrator will close down operations due to rainy periods, high water, or other adverse operating conditions in order to protect resources.</p>	<p>Timber Sale Contract</p>

BMP Name, Objective, and Direction	Application to the Keola Project	Project Phase
<p>BMP 1-8 Streamside Management Zone Designation: To designate a zone along riparian areas, streams and wetlands that will minimize potential for adverse effects from adjacent management activities. Management activities within these zones are designed to improve riparian values.</p>	<p>Streamside management zones (SMZs) have been supplemented with RCAs as described in hydrology report and the hydrology and aquatics biology design measures.</p> <p>Within SMZs, the constraints defined in Sierra Supplement No. 1 (USDA Forest Service, 1989) apply. This includes no self-propelled ground based equipment, a minimum groundcover of 50%, and shade canopy may not be modified in a way that affects stream temperature.</p> <p>Modifications to these guidelines are possible where site-specific needs exist if the action is reviewed by a hydrologist or fisheries biologist.</p>	<p>Timber Sale Contract Burn Plans</p>
<p>BMP 1-9 Determining Tractor Loggable Ground: To minimize erosion and sedimentation resulting from ground disturbance of tractor logging systems.</p>	<p>Limit ground skidding and machine piling with tractors to slopes less than 35%. Endlining can be used to remove logs from steeper slopes. Ground disturbance on areas of shallow soils, notably soils adjacent and abutting to rock outcrops, will be avoided.</p>	<p>Timber Sale Contract Site Prep</p>
<p>BMP 1-10 Tractor Skidding Design: By designing skidding patterns to best fit the terrain, the volume, velocity, concentration, and direction of runoff water can be controlled in a manner that will minimize erosion and sedimentation.</p>	<p>The sale administrator and purchaser will designate all skid trails prior to ground disturbing activities. If uncertainty arises regarding potential resource impacts of skid trail location, consult with an earth science specialist (i.e., hydrologist, aquatic biologist, or soil scientist).</p>	<p>Timber Sale Administration</p>

BMP Name, Objective, and Direction	Application to the Keola Project	Project Phase
<p>BMP 1-12 Log Landing Location: To locate new landings in such a way as to avoid watershed impacts and associated water quality degradation</p>	<p>The following criteria are to be used by the Sale Administrator when evaluating landings:</p> <ul style="list-style-type: none"> a. The cleared or excavated size of landings will not exceed that needed for safe and efficient skidding and loading operations. Trees considered dangerous will be removed around landings to meet the safety requirements of OSHA. b. Selected landing locations will involve the least amount of excavation and fill possible. Landings must be located outside of SMZs. c. Locate landings near ridges away from headwater swales in areas that will allow skidding without crossing stream channels, violating SMZs, or causing direct deposit of soil and debris to a stream. d. Locate landings where the least number of skid roads will be required, and sidecast can be stabilized without entering drainages or affecting other sensitive areas. Keep the number of skid trails entering a landing to a minimum. e. Position landings such that the skid road approach will be nearly level as feasible, to promote safety and to protect soil from erosion. f. Avoid excessive fills associated with landings constructed on old landslide benches. g. Construct stable landing fills or improve existing landings by using appropriate compaction and drainage specifications. <p>In some cases, using an existing landing located within an RCA or CAR is preferable to constructing a new landing outside of it. These situations will be reviewed on a site-by-site basis by an earth science specialist (aquatics, hydrology, geology, or soils).</p>	<p>Timber Sale Administration</p>

BMP Name, Objective, and Direction	Application to the Keola Project	Project Phase
<p>BMP 1-13 Erosion Prevention and Control Measures during Timber Sale Operations: To ensure that the purchasers' operations will be conducted reasonably to minimize soil erosion.</p>	<p>Timber purchaser responsibilities for erosion control will be set forth in the Timber Sale Contract. Equipment will not be operated when ground conditions are such that excessive damage will result. The kinds and intensity of control work required of the purchaser will be adjusted by the sale administrator to ground and weather conditions with emphasis on controlling overland runoff, erosion, and sedimentation.</p> <p>Erosion control work required by the contract will be kept current. At certain times of the year this means daily, if precipitation is likely or weekly when precipitation is predicted for the weekend. Erosion prevention measures must be applied no later than October 1 and immediately upon completion of activity begun after November 1.</p> <p>If the purchaser fails to perform seasonal erosion control work prior to any seasonal period of precipitation or runoff, the Forest Service may temporarily assume responsibility, complete the work, and use any unencumbered deposits as payment for the work.</p>	<p>Timber Sale Contract Timber Sale Administration</p>
<p>BMP 1-14 Special Erosion Prevention Measures on Disturbed Land. To provide appropriate erosion control and sedimentation protection for disturbed areas.</p>	<p>Design features include specific ground cover requirements on slopes greater than 35%, where 70% ground cover is required and around rock outcrops where 100% ground cover is required.</p>	<p>Timber Sale Administration</p>
<p>BMP 1-16 Log Landing Erosion Protection and Control: To reduce the impacts of erosion and subsequent sedimentation associated with log landings by use of mitigating measures.</p>	<p>Landings will be properly cross-ditched, ripped (if soils are compacted), re-contoured (as necessary), and mulched after use and before the winter precipitation period, whichever comes first. Excess material not needed for erosion control can be piled and burned. Upon completion of the project, consult with the hydrologist or soil scientist to determine the need for additional soil protection measures.</p>	<p>Timber Sale Administration</p>
<p>BMP 1-17 Erosion Control of Skid Trails: To protect water quality by minimizing erosion and sedimentation derived from skid trails.</p>	<p>Erosion control measures will be installed on all skid trails, tractor roads, and temporary roads. Erosion control measures include, but are not limited to, cross ditches (water bars), organic mulch, and ripping.</p> <p>Cross ditches will be spaced according to the LRMP standard 128, maintained in a functioning condition, and placed in locations where drainage would naturally occur (i.e., swales). The level of maintenance will be contingent upon existing or predicted weather patterns as determined by the Sale Administer (see BMP 1-13).</p>	<p>Timber Sale Administration</p>
<p>BMP 1-18 Meadow Protection during Timber Harvesting: To avoid damage to the ground cover, soil, and hydrologic function of meadows.</p>	<p>Mechanical equipment is not permitted in meadows unless specifically authorized by an aquatic biologist <u>and</u> hydrologist.</p>	<p>Timber Sale Administration</p>

BMP Name, Objective, and Direction	Application to the Keola Project	Project Phase
<p>BMP 1-19 Streamcourse and Aquatic Protection: The objectives of this BMP are:</p> <ul style="list-style-type: none"> a. To conduct management actions within these areas in a manner that maintains or improves riparian and aquatic values. b. To provide unobstructed passage of stormflows. c. To control sediment and other pollutants entering stream courses. d. To restore the natural course of any stream as soon as practicable, where diversion of the stream has resulted from timber management activities. 	<ul style="list-style-type: none"> a. The location and method of crossings on Class IV and V streams must be agreed to by the sale administrator (SA) prior to construction. b. Stream crossings on Class I – III streams must be approved by the hydrologist and aquatic biologist. c. Damage to stream banks and channels will be repaired to the extent practicable. d. All sale-generated debris will be removed from stream courses, unless otherwise agreed to by the SA, and in an agreed upon manner that will cause the least disturbance. e. Felled trees will not be pulled across perennial or intermittent stream channels without prior approval by the hydrologist or aquatic biologist. f. Methods for protecting water quality while utilizing tractor skid trail design in stream course areas where harvest is approved include: (1) end lining, (2) falling to the lead, and (3) utilizing specialized equipment with low ground pressure such as feller buncher harvester. g. Water bars or other erosion control structures will be located so as to disperse concentrated flows and filter out suspended sediments prior to entry into stream course. h. Material from temporary road construction and skid trail stream course crossings will be removed and stream banks restored to the extent practicable. i. Special slash treatment site preparation activities will be prescribed in sensitive areas to facilitate slash disposal without use of mechanized equipment. j. Project-related bare soil areas (e.g. skid trails, landings, temporary roads, etc.) will be covered with existing native vegetation mulch, organic debris, or certified weed free straw to at least 50%, well distributed cover, and cross-ditched per BMP 1-17 requirements. 	<p>Timber Sale Administration</p>
<p>BMP 1-20 Erosion Control Structure Maintenance: To ensure that constructed erosion control structures are stabilized and working.</p>	<p>During the period of the timber sale contract, the purchaser will provide maintenance of soil erosion control structures contracted by the purchaser until they become stabilized, but not more than one year after their construction. If the purchaser fails to do seasonal maintenance work, the Forest Service may assume the responsibility and charge the purchaser accordingly. The Forest Service sale administrator is responsible for ensuring erosion control maintenance work is completed.</p>	<p>Timber Sale Administration</p>

BMP Name, Objective, and Direction	Application to the Keola Project	Project Phase
<p>BMP 1-21 Acceptance of Timber Sale Erosion Control Measures before Sale Closure: To ensure the adequacy of required erosion control work on timber sales.</p>	<p>The sale administrator must inspect erosion control measures to ensure their adequacy prior to accepting closure on the unit and/or sale.</p> <p>The effectiveness of erosion control measures will be evaluated using BMPEP protocols (see Monitoring Plan) after the sale area has been through one or more wet seasons. This evaluation is to ensure that erosion control treatments are in good repair and functioning as designed before releasing the purchaser from contract responsibility.</p> <p>The purchaser is responsible for repairing erosion control treatments that fail to meet criteria in the Timber Sale Contract, as determined by the Sale Administer, for up to one year past closure of the sale.</p>	<p>Timber Sale Administration</p>
<p>BMP 1-22 Slash Treatment in Sensitive Areas: To maintain or improve water quality by protecting sensitive areas from degradation which would likely result from using mechanized equipment for slash disposal.</p>	<p>All burn piles made with mechanical equipment must be located outside of the SMZ.</p> <p>Hand piles will be kept at least 50 to 100 feet away from all streams, meadows, springs, seeps, and other sensitive aquatic areas.</p>	<p>Timber Sale Administration Site Prep</p>
<p>BMP 2-1 General guidelines for the Location and Design of Roads: To locate and design roads with minimal resource damage.</p>	<p>The Keola Project will construct new temporary roads during the timber sale contract period. The following considerations are incorporated into the planning process of temporary road location and design. These measures are preventative, apply to all transportation activities, and indirectly protect water quality:</p> <ul style="list-style-type: none"> (a) Transportation facilities will be developed and operated to best meet the resource management objectives with the least adverse effect on environmental values. (b) The location, design, and construction of roads will include the use of the IDT. (c) Sensitive areas such as wetlands, inner gorges, and unstable ground will be avoided to the extent practicable. (d) Stream crossings will be designed to provide the most cost efficient drainage facility consistent with resource protection, facility needs, and legal obligations. 	<p>Timber Sale Administration</p>
<p>BMP 2-2 Erosion Control Plan To minimize erosion through effective planning prior to construction</p>	<p>Erosion control methods identified in the design features and contract are implemented in a plan developed by the purchaser and approved by the Forest Service.</p>	<p>Timber Sale Administration</p>
<p>BMP 2-3 Timing of Construction Activities: To minimize erosion by conducting operations during minimal runoff periods and when soils are dry and less prone to compaction.</p>	<p>Ground-disturbing activities will occur when soils are dry. In some cases soils may never dry sufficiently. Ground-disturbing work that occurs off of existing roads will occur during the dry season and will reduce ground disturbance as much as possible.</p>	<p>Timber Sale Administration</p>

BMP Name, Objective, and Direction	Application to the Keola Project	Project Phase
<p>BMP 2-4 Stabilization of Road Slope Surfaces and Spoil Disposal Areas: To minimize erosion from exposed cut slopes, fill slopes, and spoil disposal areas.</p>	<p>This is a preventive practice using erosion control methods on exposed cuts, fills, and spoil areas as necessary.</p>	<p>Timber Sale Administration</p>
<p>BMP 2-5 Road Slope Stabilization Construction Practices: To reduce sedimentation by minimizing erosion from road slopes and slope failure along roads.</p>	<p>An adequate soils and geologic investigation will be conducted when finalizing new road construction designs for: correct cut and fill steepness based on the angle of repose for the type of material; methods to handle surface runoff; and necessary compaction standards and surfacing needs.</p>	<p>Timber Sale Administration</p>
<p>BMP 2-6 Dispersion of Subsurface Drainage from Cut and Fill Slopes: To minimize the possibilities of cut or fill slope failure and the subsequent production of sediment.</p>	<p>Subsurface drainage is often necessary if road prisms intersect ground water. No subsurface drainage is proposed for the Keola project. If subsurface drainage is necessary, the district hydrologist and aquatic biologist will be consulted prior to installing any subsurface drainage so that impacts to adjacent aquatic features can be avoided.</p>	<p>Timber Sale Administration</p>
<p>BMP 2-7 Control of Road Drainage: To minimize the erosive effects of water concentrated on roads, to disperse runoff from road surfaces, to lessen sediment yield from roaded areas, and to minimize erosion of the road prism.</p>	<p>Newly constructed or reconstructed roads will be designed to reduce hydrologic connectivity and soil erosion wherever feasible. The sale administrator or other Forest Service representative will ensure that roads are adequately maintained during project implementation to ensure that road drainage features function as designed.</p>	<p>Timber Sale Administration</p>
<p>BMP 2-8 Constraints Related to Pioneer Road Construction: To minimize sediment production and mass wasting from pioneer road construction.</p>	<p>For project temporary roads</p> <ul style="list-style-type: none"> (a) Roads will be constructed within the planned roadway limits unless otherwise specified or approved by the ER or COR. (b) Pioneer roads will be located to prevent undercutting of the designated final cut slope, avoid deposition of materials outside the designated roadway limits, and accommodate drainage with temporary culverts. (c) Erosion control work will be completed prior to the rainy season and in accordance with the contract. 	<p>Timber Sale Administration</p>

BMP Name, Objective, and Direction	Application to the Keola Project	Project Phase
<p>BMP 2-9 Timely Erosion Control Measures on Incomplete Roads and Stream Crossing Projects: To minimize erosion and sedimentation from disturbed ground on incomplete projects.</p>	<p>Erosion control must be completed before the rainy season (usually October in the Keola project area). Preventative measures for timely erosion control include:</p> <ul style="list-style-type: none"> (a) Removal of temporary culverts, culvert plugs, diversion dams, or elevated stream crossings. (b) Installation of temporary culverts, side drains, flumes, cross drains, diversion ditches, energy dissipaters, dips, sediment basins, berms, debris racks, or other facilities needed to control erosion. (c) Removal of debris, obstructions, and spoil material from channels and floodplains. (d) Planting vegetation, mulching, and/or covering exposed surfaces with jute mats or other protective material. 	<p>Timber Sale Administration</p>
<p>BMP 2-10 Construction of Stable Embankments: To construct embankments with materials and methods which minimize the possibility of failure and subsequent water quality degradation.</p>	<p>Temporary roadways will be designed and constructed as stable and durable earthwork structures with adequate strength to support the roadway, shoulders, subgrade and road traffic loads.</p>	<p>Timber Sale Administration</p>
<p>BMP 2-11 Control of Sidecast Material During Construction and Maintenance: To minimize sediment production originating from sidecast material during road construction or maintenance.</p>	<p>Sidecasting is not permitted within SMZs. Waste areas must be located where excess material can be deposited and stabilized.</p>	<p>Timber Sale Administration</p>
<p>BMP 2-12 Servicing and Refueling Equipment: To prevent pollutants such as fuels, lubricants, bitumens and other harmful materials from being discharged into or near rivers, streams and impoundments, or into natural or man-made channels.</p>	<p>Storage of hazardous materials (including fuels) and servicing and refueling of equipment will be conducted at pre-designated locations outside of RCAs. If fueling and/or storage of hazardous materials are needed within RCAs, those sites must be reviewed and approved by the district hydrologist or aquatic biologist. Additional protection measures, such as containment devices, may be necessary.</p>	<p>Timber Sale Administration</p>
<p>BMP 2-13 Control of Construction and Maintenance Activities Adjacent to SMZs: To protect water quality by controlling construction and maintenance actions within and adjacent to SMZs so that SMZ functions are not impaired.</p>	<p>Construction and maintenance fills, sidecast, and end-hauled materials will be kept out of SMZs except at designated crossing sites to minimize the effect to the aquatic environment.</p>	<p>Timber Sale Administration</p>
<p>BMP 2-14 Controlling In-Channel Excavation: To minimize stream channel disturbances and related sediment production.</p>	<p>There will be no in-channel or stream bank excavation during any phase of project activities unless authorized by the district hydrologist or aquatic biologist.</p>	<p>Timber Sale Administration</p>

BMP Name, Objective, and Direction	Application to the Keola Project	Project Phase
<p>BMP 2-15 Diversion of Flows Around Construction Sites. To ensure that all stream diversions are carefully planned, to minimize downstream sedimentation, and to restore stream channels to the natural grade, condition, and alignment as soon as possible.</p>	<p>No in-channel work is proposed as part of the Keola project. There will be no in-channel or stream bank diversions related to road construction during any phase of project activities unless authorized by the district hydrologist or aquatic biologist.</p>	<p>Timber Sale Administration</p>
<p>BMP 2-16 Stream Crossings on Temporary Roads and Skid Trails: To ensure crossings do not unduly damage stream channels or impede aquatic species passage.</p>	<p>Mechanical equipment crossing of perennial and intermittent (generally class I – III) streams is not permitted unless approved by the district hydrologist or aquatic biologist. Ephemeral streams (stream class IV and V) may be crossed at designated locations as agreed upon by the sale administrator and purchaser. Designate skid trails to avoid stream crossings and SMZs wherever possible. Designated crossings must be as perpendicular to the channel as possible and avoid sensitive soils and riparian vegetation damage. Stream banks must be repaired upon completion of the project.</p>	<p>Timber Sale Administration</p>
<p>BMP 2-17 Bridge and Culvert Installation. To minimize sediment and turbidity resulting from excavation of in-channel structures.</p>	<p>No bridges or culverts are proposed as part of the Keola project. Any bridge or culvert installation will be coordinated with the district hydrologist or aquatic biologist.</p>	<p>Timber Sale Administration</p>
<p>BMP 2-19 Disposal of Right-of-Way and Roadside Debris: To ensure that organic debris generated during road construction is kept out of streams so that channels and downstream facilities are not obstructed.</p>	<p>If slash generated by road work is disposed of within SMZs, it will be piled and burned or chipped. Material may also be removed from the SMZ for disposal.</p>	<p>Timber Sale Administration</p>
<p>BMP 2-20 Specifying Riprap Composition: To minimize sediment production associated with the installation and utilization of riprap material.</p>	<p>No riprap is proposed as part of the Keola project. Any riprap installation will be coordinated with the district hydrologist or aquatic biologist.</p>	<p>Timber Sale Administration</p>
<p>BMP 2-21 Water Source Development Consistent with Water Quality Protection: To supply water for roads and fire protection while maintaining existing water quality.</p>	<p>Water drafting will not occur in streams when the base discharge is less than 1.5 cfs, and will not draft more than 50% of the ambient discharge over 1.5 cfs. New drafting sites shall be approved by the district hydrologist or fisheries/aquatic biologist and located to minimize sediment and maintain riparian resources, channel condition, meadow integrity, and aquatic species viability and habitat. Approaches will be as near perpendicular to the stream as possible and will be gravel surfaced or otherwise stabilized.</p> <p>If water-drafting is required, pumps with low entry velocity and suction strainers with screens less than 2 mm in size (1/8 in.) will be used.</p>	<p>Timber Sale Administration Prescribed Fire Implementation</p>

BMP Name, Objective, and Direction	Application to the Keola Project	Project Phase
<p>BMP 2-22 Maintenance of Roads: To maintain roads in a manner that provides for water quality protection by minimizing rutting, failures, sidecasting, and blockage of drainage facilities, all of which can cause erosion, sedimentation, and deteriorating watershed conditions.</p>	<p>Roads needed for project activities will be brought to current engineering standards of alignment, drainage, and grade before use, and will be maintained through the life of the project. Roads will be inspected at least annually to determine what work, if any, is needed to keep ditches, culverts, and other drainage facilities functional and the road stable.</p>	<p>Timber Sale Administration</p>
<p>BMP 2-23 Road Surface Treatment to Prevent Loss of Materials:</p>	<p>Surface stabilization will be considered where grades exceed 12% or road is within riparian conservation areas.</p>	<p>Timber Sale Administration</p>
<p>BMP 2-24 Traffic Control During Wet Periods: To reduce road surface disturbance and the rutting of roads, and to minimize sediment washing from disturbed road surfaces.</p>	<p>On roads not designated for all weather or winter haul, heavy equipment operations will be limited until the period after the soil has dried in the top 12 inches in the spring.</p>	<p>Timber Sale Administration</p>
<p>BMP 2-25 Snow Removal Controls to Avoid Resource Damage: To minimize the impact of snowmelt runoff on road surfaces and embankments and to consequently reduce the probability of sediment production resulting from snow removal operations.</p>	<p>No snow removal is planned for the Keola project. If snow removal is necessary to implement project activities, appropriate controls will be implemented in consultation with the district hydrologist prior to approving snow removal.</p>	<p>Timber Sale Administration Prescribed Fire Implementation Tree planting</p>
<p>BMP 2-26 Obliteration or Decommissioning of Roads: To reduce sediment generated from temporary roads, unneeded system and non-system roads by obliterating or decommissioning them at the completion of the intended use.</p>	<p>Temporary roads will be obliterated after serving their intended purpose for this project. This includes: (1) road effectively barricaded; (2) road effectively drained by measures such as re-contouring or outsloping to return surface to near natural hydrologic function; (3) a well distributed mulch or organic cover provides at least 50% cover, or road surface is revegetated using local native species; (4) side slopes are reshaped and stabilized to match the natural contour (as necessary); and (5) stream crossings are removed and natural channel geometry is restored. If non-local mulch is used (such as straw), it must be approved by the Forest Service as weed free.</p>	<p>Timber Sale Administration</p>
<p>BMP 5-8 Pesticide Application According to Label Directions and Applicable Legal Requirements: To avoid water contamination by complying with all label instructions and restrictions for use.</p>	<p>This BMP requires Sporax® applicators to strictly adhere to pesticide label instructions.</p>	<p>Timber Sale Administration</p>

BMP Name, Objective, and Direction	Application to the Keola Project	Project Phase
<p>BMP 5-10 Pesticide Spill Contingency Planning: To reduce contamination of water by accidental pesticide spills.</p>	<p>A pesticide spill contingency plan (PSCP) will be developed and implemented for the project use of Sporax®. It may be incorporated into any spill prevention and countermeasure plan developed for BMP 7-4.</p> <p>The pesticide spill contingency plan will at a minimum include: the types and amounts of Sporax® located in the project area, pre-project identified locations for Sporax® storage (must be located outside of RCA unless prior approval by the district hydrologist or aquatic biologist is obtained), methods for containment of hazardous materials and contents of on-site emergency spill kit, and a contingency plan (including notification requirements, contact names with phone numbers) to implement in the event of a spill.</p> <p>The PSCP plan must be approved by the Forest Service prior to project implementation.</p>	<p>Timber Sale Administration</p>
<p>BMP 5-11 Cleaning and Disposal of Pesticide Containers and Equipment: To prevent water contamination resulting from cleaning or disposal of pesticide containers.</p>	<p>The cleaning and disposal of Sporax® containers will be done in accordance with Federal, State, and local laws, regulations and directives.</p>	<p>Timber Sale Administration</p>
<p>BMP 5-12 Streamside Wet Area Protection During Pesticide Spraying: To minimize the risk of pesticide inadvertently entering waters, or unintentionally altering the riparian area, SMZ, or wetland.</p>	<p>If Sporax® is to be applied within a SMZ, the district fisheries/aquatic biologist will need to be consulted prior to application.</p>	<p>Timber Sale Administration</p>
<p>BMP 6-2 Consideration of Water Quality in Formulating Fire Prescriptions: To provide for water quality protection while achieving the management objectives through the use of prescribed fire.</p>	<p>Prescribed burning is planned at the minimum intensity and severity necessary to achieve management objectives, and each Burn Plan will incorporate all relevant design measures from this EA.</p>	<p>Burn Plans</p>
<p>BMP 6-3 Protection of Water Quality from Prescribed Burning Effects: To maintain soil productivity, minimize erosion, and minimize ash, sediment, nutrients, and debris from entering water bodies.</p>	<p>Fires will be allowed to back into riparian vegetation, but direct lighting within riparian vegetation will not occur.</p> <p>All fire lines within RCAs will be water barred per BMP 1-17 spacing requirements. Fire lines within RCA (i.e., 150 ft., seasonal streams, and 300 ft. perennial streams, springs, and meadows) will be designed and constructed to reduce sediment entry into channels. Fire lines in RCAs will cross perpendicular to streams and follow the natural landscape contour as much as possible. Firelines within the SMZ will be hand cut. Waterbars will be placed on either side of each stream crossing to prevent or reduce sediment entry into streams.</p>	<p>Prescribed Fire Implementation</p>

BMP Name, Objective, and Direction	Application to the Keola Project	Project Phase
<p>BMP 7-3 Protection of Wetlands: To avoid adverse water quality impacts associated with destruction, disturbance, or modification of wetlands.</p>	<p>Ground disturbing activities will not occur in wetlands or meadows.</p>	<p>Timber Sale Administration</p>
<p>BMP 7-4 Oil and Hazardous Substance Spill Contingency Plan and Spill Prevention Containment and Countermeasure (SPCC) Plan: To prevent contamination of water from accidental spills.</p>	<p>A spill contingency plan and spill prevention and countermeasure plan (SPCC) must be prepared if hazardous materials (including fuels and oils) stored on the Sierra National Forest exceed 1320 gallons, or if a single container exceeds 660 gallons. A SPCC is also required for Sporax[®] application. (See BMP 5-10.)</p> <p>The plan will at a minimum include: the types and amounts of hazardous materials located in the project area, pre-project identified locations for hazardous materials storage and fueling/maintenance activities (must be located outside of RCA unless prior approval by district hydrologist or aquatic biologist is obtained), methods for containment of hazardous materials and contents of on-site emergency spill kit, and a contingency plan (including contact names with phone numbers) to implement in the event of a spill.</p> <p>The SPCC plan must be approved by the Forest Service prior to project implementation.</p>	<p>Timber Sale Administration Prescribed Fire Implementation</p>

