



United States Department of Agriculture

# Mokelumne Amador Calaveras Forest Health and Resilience Project

## Scoping Notice



Forest Service

Eldorado and Stanislaus National Forests

2024

Cover Photo: Photo taken by Katie Ross-Smith from Highway 88, facing west towards the Caldor Fire burn area.

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# Mokelumne Amador Calaveras Forest Health and Resilience Project

## Scoping Notice

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**Comment Period:** The 30-day scoping period begins when the Notice of Intent (NOI) is published in the Federal Register. Once published, a copy of the NOI will be posted on the Project website. Comments should be provided prior to the close of the comment period and should clearly articulate the reviewer's feedback regarding the scope of the Project to be considered and scope of analysis that should be conducted. Comments received in response to this solicitation, including names and addresses of those who comment, will be part of the public record for this proposed action.

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is that the proposed actions effectively modify forest stand densities and fuel conditions across the landscape to reduce the risk of widespread habitat loss due to wildfire, insects, disease, drought, and the effects of climate change.

While many recent forest management activities have focused on recovery from devastating wildfires, including in the Eldorado NF following the 2021 Caldor Fire, it is critical that we move forward with efforts to sustain our existing green forests and their associated dynamic ecosystem processes and values. Given the trend in increased size and severity of wildfires in California, solutions need to be analyzed, planned, and implemented at a scale and intensity that will make a difference. The MAC Forest Project will include a broad suite of proposed actions, including commercial and non-commercial mechanical thinning, other mechanical and hand fuel treatments, prescribed fire, fuel break construction and maintenance, hazard tree abatement, non-native invasive weed control and eradication, and ecological restoration activities.

The Project represents the second phase of planning efforts in the Project Area. The MAC Forest Project encompasses the Forest Projects Plan (FPP) Phase 1, shown on Map 1, a 25,670-acre project within the Amador Ranger District that completed environmental review in 2022 and is currently being implemented. FPP Phase 1 covers a limited set of treatment options, including non-commercial actions to treat understory fuels, hand treatments to establish fuel breaks and improve wildlife habitat, limited removal of critical hazard trees, and prescribed fire. The MAC Forest Project also includes additional forest management actions, as described in the paragraph above, which are beyond those that were included in FPP Phase 1.

While the Forest Service serves as the lead National Environmental Policy Act (NEPA) agency, similar to FPP Phase 1, the MAC Forest Project is being developed and implemented in partnership with the Upper Mokelumne River Watershed Authority (UMRWA), a joint powers authority comprising six water agencies (Alpine Water Agency, Amador Water Agency, Calaveras County Water District, Calaveras Public Utility District, East Bay Municipal Utility District, and Jackson Valley Water District) and the counties of Amador, Calaveras, and Alpine. UMRWA's role in the Project is facilitated under a master stewardship agreement between the Forest Service and UMRWA, signed May 18, 2016. The USFS and UMRWA seek to build broad public support for the Project by engaging stakeholders early in the planning process. There will be multiple opportunities for public involvement throughout project development, including public meeting(s). Additionally, UMRWA is collaborating closely with the Amador-Calaveras Consensus Group—a community-based stakeholder collaborative that works through a consensus process to develop recommendations to public land managers in support of projects that create healthy forests and watersheds, fire-safe communities, and sustainable local economies.

The USFS has sent a letter formally introducing the Project to Tribes, including the Jackson Rancheria Band of Miwok Indians, Buena Vista Rancheria of Me-wuk Indians, Wilton Rancheria, Ione Band of Miwok Indians, Tuolumne Band of Me-Wuk, Calaveras Band of Miwok, California Valley Miwok Tribe, and Washoe Tribe. While only the Federal government

can engage in formal government-to-government communication, UMRWA has initiated contact with relevant stakeholders and interested parties to expand opportunities for Project outreach.

## 2 Location and Existing Conditions

The Project Area is located in California's central Sierra Nevada and includes portions of Amador, Calaveras, El Dorado, Tuolumne, and Alpine counties (Figure 1 and Map 1). It spans elevations from 1,250 feet along the western edge of the Project Area and in river canyons to approximately 9,700 feet at the Project Area's eastern edge in the high Sierra Nevada.

Portions of the Project Area border the Placerville Ranger District of the Eldorado NF to the north and the Summit and Mi-Wok Ranger Districts of the Stanislaus NF to the south. The Project Area also borders property managed by the Bureau of Land Management, California Department of Fish and Wildlife, and California Department of Parks and Recreation (Calaveras Big Trees State Park), as well as private property. Portions of the eastern Project Area boundary abut designated wilderness (Mokelumne Wilderness and Carson-Iceberg Wilderness). The Project does not include any designated wilderness areas. The Project Area includes the proposed Caples Creek Wilderness Area and 68,758 acres of inventoried roadless areas (Map 2).

The MAC Forest Project is located within and adjacent to the Mokelumne River watershed, with the North Fork Mokelumne River flowing east to west through the approximate center of the Project Area. The Mokelumne River defines the boundary between the Amador and Calaveras Ranger districts and between Amador and Calaveras counties. Portions of the Mokelumne River in the Project Area (approximately 20 miles) are designated as part of the California Wild and Scenic Rivers System. The Middle Fork Cosumnes River, Bear River, South Fork Mokelumne River, and North Fork Stanislaus River also flow through the Project Area. Critical water storage infrastructure that provides water for many local communities, downstream agricultural users, and 1.4 million downstream Bay Area residents is located within the Project Area, as well as power and hydroelectric infrastructure.

California State Route (SR) 4 runs east–west through the Project Area in the Calaveras Ranger District and SR 88 runs east–west through the project area in the Amador Ranger District. The Project Area includes numerous campgrounds, picnic areas, trailheads, and other recreational facilities, including portions of the Kirkwood and Bear Valley ski areas. The Project Area includes areas within the Wildland Urban Interface (WUI—i.e., the area where structures and other infrastructure are adjacent to wildland vegetation) including WUI defense zones (typically the area up to 1,500 feet from the edge of structures) and WUI threat zones (typically 1.25 miles beyond the defense zone boundary).

The Project Area provides habitat for a wide diversity of plant and wildlife species, including numerous special-status species. These include California spotted owl (*Strix occidentalis occidentalis*), American goshawk (*Accipiter atricapillus*), Sierra Nevada yellow-legged frog (*Rana sierrae*), foothill yellow-legged frog (*Rana boylei*), California red-legged frog (*Rana draytonii*), Yosemite toad (*Anaxyrus canorus*), and whitebark pine (*Pinus albicaulis*). Map 3 and

Table 1 provide information about the locations and quantities of California spotted owl and American goshawk protected activity centers (PACs) in the Project Area. Map 4 shows potential suitable habitat for foothill yellow-legged frog, California red-legged frog, Sierra Nevada yellow-legged frog, Yosemite toad, and northwestern pond turtle in the Project Area. Map 5 shows locations of U.S. Fish and Wildlife Service (USFWS)–designated critical habitat for Sierra Nevada yellow-legged frog and Yosemite toad in the Project Area.

**Table 1. California Spotted Owl and American Goshawk PACs in the Project Area**

PACs	Stanislaus NF		Eldorado NF	
	Number of PACs	Acres in the Project Area	Number of PACs	Acres in the Project Area
California spotted owl	71	17,475	57	16,135
American goshawk	25	4,245	25	5,140

Vegetation in the Project Area is dominated by conifer woodland/forest vegetation communities, with mostly mixed conifer-pine in lower elevation portions of the Project Area, mixed conifer-fir in the mid-elevation portions of the Project Area, and the red fir forest type dominating at high elevations (above approximately 6,000 feet) (Maps 6 and 7; Table 2).

**Table 2. Vegetation in the Project Area**

CALVEG Community <sup>1</sup>	Acres in the Project Area	Proportion of the Project Area (%)
Conifer Forest / Woodland		
Red Fir	62,677	25.4
Mixed Conifer-Pine	50,162	20.3
Mixed Conifer-Fir	30,388	12.3
Whitebark Pine	13	0.01
Other Conifer Forest / Woodland	44,676	18.1
Hardwood Forest / Woodland		
Quaking Aspen <sup>2</sup>	860	0.3
Black Oak	863	0.3
Other Hardwood Forest / Woodland	7,779	3.1
Shrubs and Chaparral	19,972	8.1
Riparian	514	0.2
Herbaceous		
Wet Meadow	1,025	0.4
Other Herbaceous	6,811	2.7
Land Use and Non-Vegetated	17,289	7.0
Water Features (rivers, streams, lakes, and reservoirs)	4,660	1.9

<sup>1</sup> Source: USFS 2018, 2019a. CALVEG – Classification and Assessment with Landsat of Visible Ecological Groupings

<sup>2</sup> Source: Aspen acreages provided by the Institute for Bird Populations based on recent preliminary field mapping (personal communication, February 15, 2024). All other vegetation community acreages were derived from CALVEG.

The Project Area includes forest areas in old growth conditions. Preliminary estimates of existing old growth within the Project Area were estimated from modeling, using USFS Region 5 old growth definitions (USFS 2023a), which consider estimates of trees per acre of large trees derived from F3 data<sup>1</sup> (Huang et al. 2018), with large trees defined by the minimum diameter for each forest vegetation type. Preliminary modeled estimates suggest that approximately 10-15% of the Stanislaus NF in the Project Area and approximately 5-10% of the Eldorado NF in the Project Area meet the criteria for old growth.

Recent field inventories by the Institute for Bird Populations mapped approximately 860 acres of quaking aspen woodlands in the Project Area. Although aspen stands make up only a small fraction of the landscape, they contribute significantly to biodiversity. However, due to conifer encroachment, fire suppression, and livestock/wildlife browsing, aspen communities throughout the Sierra Nevada, including the Project Area, are declining in vigor, with fewer and smaller stands and with existing stands often of advanced age with minimal regeneration (Krasnow et al. 2012). Meadows, like aspen, are a small proportion of the Project Area (0.4% or approximately 1,025 acres) yet are critical to the health and resiliency of the landscape due to the ecosystem benefits they provide, including their contributions to water security and filtration, to carbon capture, as natural fire breaks, and as biodiversity hotspots, among other benefits (Sierra Meadows Project 2018). Hydrologic degradation, conifer encroachment, and fire suppression have been key factors in diminishing the ecological value of California's meadows, including within the Project Area.

Fir-dominant or co-dominant communities constitute almost 40% of the Project Area (37.7%), with red fir forest comprising approximately 62,677 acres or 25.4% of the Project Area and mixed conifer-fir covering 30,388 acres or 12.3% of the Project Area. Mixed conifer-pine covers 50,162 acres or 20.3% of the Project Area (Map 6). Some of these mixed-conifer stands were managed in the past through timber harvest, prescribed burning, and other activities. In many of these areas, however, the elapsed time since management has resulted in the development of a significant understory of small trees, areas with relatively dense pole-sized stands with a moderate shrub understory, and areas with limited tree cover and dense understories of shrubs such as dogwood, deer brush, white thorn, and manzanita. The Project Area also includes small areas (approximately 13 acres) mapped as whitebark pine, a federally listed threatened species that grows at the alpine tree line and subalpine elevations (USFWS 2022).

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<sup>1</sup> F3 data (Huang et al. 2018) is a collection of algorithms developed by USFS Region 5 that combine remotely sensed, biophysical setting, climate, and Forest Inventory and Analysis (FIA) data to estimate forest dynamics and spatiotemporal forest change.

The Project Area includes forest areas characterized by overly dense, relatively small-diameter trees. In this condition, growth is limited by competition for water, space, and other resources. A measurement of stand density or competition among trees in a stand, the stand density index (SDI) considers the number of trees per unit area as well as the size (diameter) of those trees to assess total forest biomass. The maximum stand density represents an approximate upper limit to the occupancy of a site, where tree growth has become limited by competition and growth is only possible after the death of some individuals (Young-Hart et al. 2023). A high relative proportion of maximum SDI is found throughout the Project Area (Map 8), indicative of conditions ripe for increased tree mortality and vulnerability to the effects of wildfire and climatic changes.

The majority of the Project Area has not burned in the past few decades. Map 9 shows wildfires that have burned within or near the Project Area since 2000. Much of the landscape just north of the Project Area was burned in 2021 in the 221,000-acre Caldor Fire. The 2018 Donnell Fire bordered a small portion of the southeastern part of the Project Area. Other previous wildfires that have overlapped with the Project Area were relatively small and/or occurred 20 years or more in the past, such as the 2004 Power Fire that burned approximately 17,000 acres, including a portion of the Amador Ranger District in the Project Area.

Current forest conditions have placed the Project Area at an elevated risk of high-severity wildfires. High-severity fires are defined as fires that have flame lengths that exceed 8 feet in height, are generally considered beyond mechanical control thresholds, are commonly associated with tree torching and crown fire ignition, and are often referred to as “stand-replacing” fires (Young-Hart et al. 2023). Stand-replacing fires are fires that kill most or all overstory trees in a stand. Based on wildfire hazard modeling of the Project Area, 33% of the Project Area (80,561 acres) has a greater than 50% probability of high-severity fire (Map 10). This includes 32,592 acres in the Eldorado NF and 47,969 acres in the Stanislaus NF.

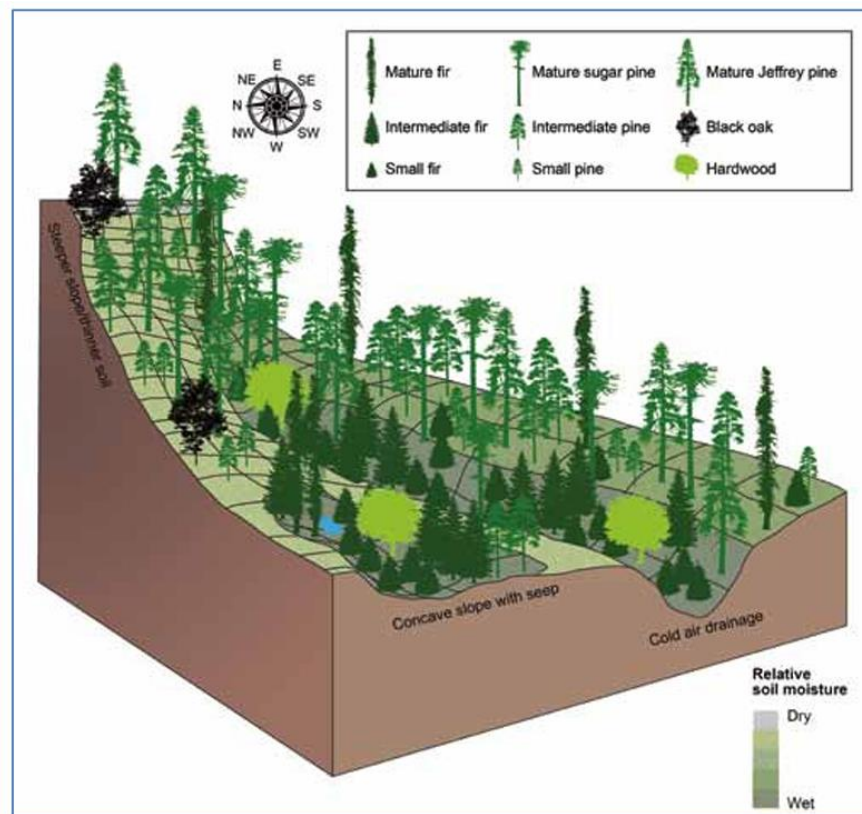
The Project Area includes sites with incised creek channels, failing culverts, and other aquatic features with degraded hydrology and water quality, and reduced habitat quality. The Project Area also includes upland areas with erosional features and other degraded conditions that affect watershed integrity. Causes of degradation to both upland and aquatic ecosystems include impacts from roads and other infrastructure, historic logging impacts, and historic grazing impacts. The Project Area also includes known infestations of invasive species and there is a risk of new infestations occurring if left uncontrolled. Known invasive plant populations in the Project Area are shown on Map 11.

### **3 Desired Conditions**

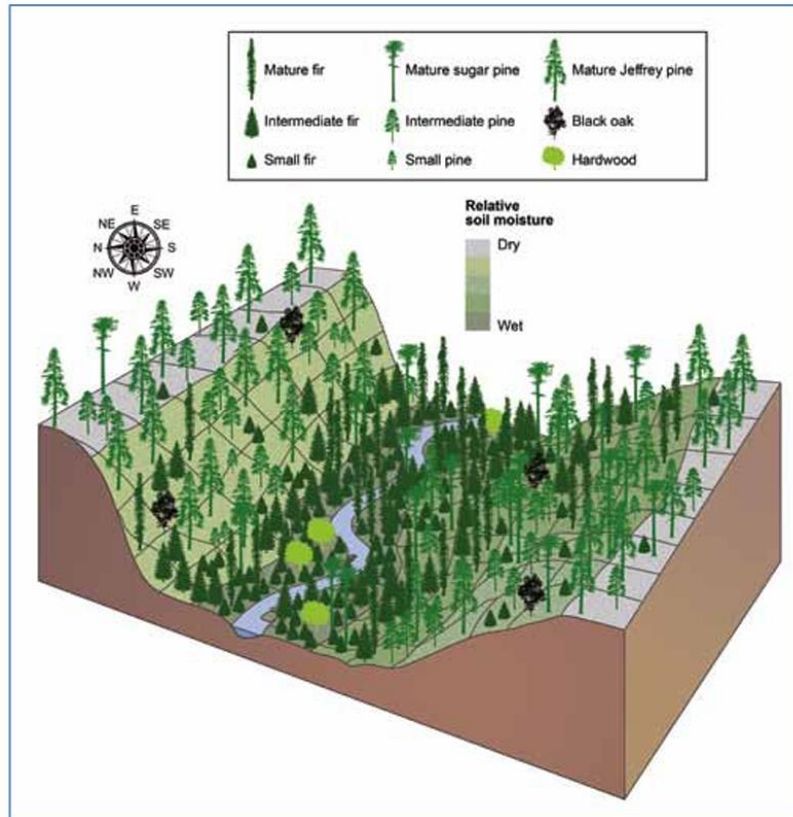
The Project will design and implement treatments to support a suite of complimentary objectives, including those that will: (1) increase within- and between-stand heterogeneity; (2) reduce stand densities; (3) increase the large tree component on the landscape; (4) increase the relative abundance of fire-tolerant and shade-intolerant tree species; (5) reduce surface and ladder fuels; (6) increase management by prescribed fire; and (7) actively restore habitat at degraded sites.

Desired conditions for the forest in the Project Area are characterized by heterogeneity, both within individual stands and among stands on the landscape, with a mosaic of individual trees and clumps of trees with openings of various sizes. Tree clumps may be retained in drainages, on steep slopes, or in other areas with operability challenges. In addition to tree clumps, there will be irregular shaped openings with less than 10% tree cover, varying in size (0.05 to 0.5 acres, or more). Openings will be located, where possible, adjacent to healthy, mature conifers and oaks to promote regeneration and reduce competition (Hood et al. 2018).

Desired conditions for forest stands are densities that minimize the risk of drought- and insect-related mortality for the given forest type and presence of large trees and snags. Density targets vary with ecological considerations. At the stand-level, open canopy conditions are desired on upper slope positions (ridges) and south-facing aspects, while denser canopy conditions are desired on lower slope positions (drainages) and on north-facing aspects as guided by North et al. (2009) (Figure 2 and Figure 3).



**Figure 2. Desired Post-Treatment Stand-Level Forest Structure and Composition (North et al. 2009)**



**Figure 3. Desired Post-Treatment Landscape-Scale Variable Forest Conditions that Differ by Topographic Factors such as Slope, Aspect, and Slope Position (North et al. 2009).**

Within California spotted owl habitat, desired conditions are the structural characteristics of highest-quality habitat, including large, tall trees with moderate to high canopy cover. Within California spotted owl PACs, desired conditions are high canopy cover with some areas of subdominant canopy layers, large snags, and higher than average levels of down woody material. The distribution of shrubs, forbs, patches of tree regeneration and bare ground in the understory of mid- to late-seral areas would be patchy. Forest gaps, which occur with a natural fire interval, promote forest resiliency and heterogeneity. Within spotted owl PACs, desired canopy gap size is less than 0.25 acre and desired average size for the dominant and co-dominant crown classes is 24 inches DBH or greater.

Throughout Sierra Nevada montane forests, many decades of fire suppression have led to a major shift from the dominance of shade-intolerant, fire-resilient species, such as pines and oaks, to the dominance of shade-tolerant species, primarily white fir and incense cedar (Safford and Stevens 2017). This dominance in shade-tolerant species compared to shade-intolerant, fire-resilient species reduces forest heterogeneity and increases chance of stand replacing fire. Desired conditions for tree composition are more fire-resistant and shade-intolerant species (ponderosa pine, Jeffrey pine, sugar pine, black oak), and fewer shade-tolerant species (primarily white fir and incense cedar).

Desired conditions for forest fuels are spacing among younger trees, broken ground-to-crown vegetation connectivity, and levels of secondary growth that have a low risk of wildfire and low wildfire severity. Desired conditions for understory ladder and surface fuels improve wildfire behavior and facilitate the use of prescribed fire. Forest stands will be less overcrowded, and have fewer small trees, lower surface fuels, and higher canopy base height. Hardwoods will be retained and managed consistent with current guidance (USFS 2004). Invasive plant populations will be decreased and native plant species diversity will be increased. In the event of a wildfire, flame lengths and fire intensity will be reduced; crown fire potential will be lessened; suppression effectiveness will be increased; and firefighter safety will be improved.

Functioning watershed processes are vital for healthy, resilient forests and other ecosystems. The MAC Forest Project also seeks to restore and improve these processes in various ecosystems in the Project Area, including aspen stands, riparian areas, streams, and meadows. These ecosystems support a high diversity of native terrestrial and aquatic wildlife for some or all portions of their life cycle. Desired conditions in these sensitive ecosystems include improved surface water infiltration and hydrologic connectivity between surface and subsurface flows; high stream water quality with low sediment outputs, low turbidity, and cool water temperatures; healthy meadow soils; and diverse native plant species composition and woody age class structure. Surface and subsurface hydrologic connectivity is important for groundwater recharge, maintaining late season stream flows and higher water tables, and attenuation and delay of peak flows. Healthy meadow soils, with high levels of organic matter, have a high water holding capacity and net carbon sequestration (Vernon et al 2019). At target aspen stands in the Project Area, the historical aspen stand edge will be reestablished, stand function enhanced, the diversity of age classes increased, and aspen growth promoted. At target impaired riparian areas, streams, and meadows, desired conditions will include reduced conifer encroachment, repaired eroding sites, and reduced invasive species, as well as other restored conditions, as applicable.

## **4 Purpose and Need for Action**

The purpose of the MAC Forest Project is to restore ecosystem health and resilience to wildfire, insect and disease, drought, and climate change; reduce safety hazards across public lands; reduce the spread of non-native species; maintain and support local economies; and maintain and improve aspen groves, riparian areas, streams, and meadows. The proposed actions are needed to reduce the risks of wildfire within and adjacent to USFS managed lands; improve and maintain safe ingress/egress routes for fire personnel, equipment, and the public; maintain and promote plant and wildlife habitat and biodiversity; and reduce the spread of non-native invasive plants.

The Project is needed because past management actions, including fire suppression, historical logging practices, changing climate, increased human populations, and increased human-caused fires/ignitions over the last approximately 150 years have extensively altered current forest conditions and ecosystem processes in the Sierra Nevada. Forests, watersheds, and landscapes

have become increasingly susceptible to threats such as large, high-severity wildfires and widespread drought-, insect-, and disease-induced tree mortality (Safford and Stevens 2017).

The recent increases in the size, frequency, and intensity of fires have resulted in ecosystem transitions and other environmental effects. Forested ecosystems were once balanced by periodic moderate- and low-severity fires ignited by lightning or as part of Native American burning practices. In the absence of these periodic fires, forested landscapes have become more homogeneous, characterized by tightly packed small- and medium-sized trees, increased canopy cover, fewer large-diameter trees, heavy concentrations of fuels on the forest floor, an abundance of low-growing vegetation (ladder fuels), and a shifted dominance from fire-resistant species like pines to shade-tolerant, fire-susceptible tree species such as white fir (Mallek et al. 2013; Miller et al. 2009; Steel et al. 2015; USFS 2019b, 2023b). Forests in these conditions are composed of stressed trees that are at high risk of catastrophic wildfire and suffering from historic levels of tree mortality from insects and disease.

These dramatic shifts have reduced forest and watershed health, forest resiliency, and habitat quality and quantity for sensitive species and pose a risk to natural biodiversity (North et al. 2021). Current conditions have also placed surrounding human communities at an elevated risk from high-severity wildfire. The existing conditions in the Project Area threaten the resilient capacity of the ecosystem to persist under changing climatic conditions and recover from the effects of wildfire and drought. . The purpose of the Project is to improve forest conditions and regain the ecosystem's natural resilience to these inevitable disturbances and better adapt to a changing climate.

Large scale wildfire, driven by overly dense forests, not only affects the resilience of the ecosystem but also the people that live in and around the forests. The MAC Forest Project aims to improve community safety surrounding wildfire risks, creating opportunities for wildfire suppression where firefighters can safely protect communities and safely manage prescribed fires necessary to maintain ecosystem health.

A healthy, resilient ecosystem also depends on functioning watersheds. This Project seeks opportunities to improve, maintain and restore the various ecosystems in the Project Area. Fire has played a significant role in shaping ecosystems of the Sierra Nevada, and reintroducing fire as an ecosystem process is vital in maintaining ecosystem resilience in the Project Area. Some ecosystem processes have been disrupted or altered by the invasion of non-native species or past management actions like over grazing or poor placement of roads. There is a need to identify and restore ecosystems in the Project Area affected by these factors; to repair erosional sites and otherwise correct impaired areas, improve surface water infiltration and hydrologic connectivity, remove debris, treat invasive species, protect bare soil, increase ground cover, revegetate with native plants, and implement other restoration actions, as applicable.

The proposed action will be developed to meet the following purpose and needs of the Project:

1. Reduce safety hazards across public lands.

- 1.1 Reduce the risks of wildfire to communities and their assets within and adjacent to USFS-managed lands.
- 1.2 Increase firefighter and public safety by improving and maintaining safe ingress/egress routes for fire personnel, equipment, and the public.
2. Restore ecosystem health and resilience.
  - 2.1 Increase forest resilience to natural disturbances and stressors, including large-scale wildfires, insect and disease, drought, and climate change.
  - 2.2 Improve and protect plant and wildlife habitat and biodiversity, including but not limited to conserving special-status species.
  - 2.3 Improve and protect watershed integrity, water yield, and water resources, including water supply and water quality.
  - 2.4 Reduce the spread of non-native, invasive species.
3. Promote a fire-resilient landscape.
  - 3.1 Reestablish fire processes and support the safe and effective use of fire management strategies.
  - 3.2 Incorporate Traditional Ecological Knowledge into management activities.
4. Maintain and support local economies.
  - 4.1 Provide jobs and forest products from restoration and management activities.
  - 4.2 Protect or enhance ecosystem services, such as water yield, carbon sequestration, wildlife habitat, and recreation.

## 5 Proposed Action

The following suite of proposed actions were selected to meet the MAC Forest Project purpose and need. One EIS will be prepared for the Project that evaluates potential impacts for both NFs. The EIS will evaluate multiple alternatives, including the no-action alternative. Decisions that authorize Project actions will be made separately for the Eldorado NF and Stanislaus NF by the Responsible Official for each NF.

MAC Forest Project actions will be implemented in targeted portions of the Project Area using a staged approach over the next 10 years or more. Follow-up treatment to achieve or maintain desired conditions will be implemented beyond 10 years. The Project will use adaptive management principles to modify management practices over time based on new science and monitoring of Project results. MAC Forest Project will include a long-term monitoring program to measure treatment effectiveness and ecological, socioeconomical, and cultural co-benefits to inform adaptive management at the landscape scale. Monitoring will encompass both remotely sensed and field-based data. The monitoring program is intended to guide the use of maintenance treatments as noted above.

To inform priorities, action strategies, and locations for treatments, spatial modeling will be used to identify focus areas for maximizing desired Project benefits and optimizing objectives in

target areas. Spatial modeling for the Project is being conducted by the developers of Planscape,<sup>2</sup> a decision support tool that helps regional land managers prioritize landscape treatments to mitigate fire risk, maximize ecological benefits, and help California's landscapes adapt to climate change. Planscape is a collaborative effort by the California Natural Resources Agency and USFS, the University of California, and Spatial Informatics Group with support from Google.org. A team of Planscape developers will complete spatial analysis and modeling for the Project to support evaluation of alternative treatment scenarios, impact analysis, and climate-informed planning, using an approach that combines the use of the existing Planscape decision-support tool functions with custom, Project-specific modeling and analysis.

## **5.1 Types of Management Activities**

The proposed action will involve landscape-scale vegetation management designed to better align current forest landscape structure and composition with desired conditions. In addition to forest health treatments for landscape resilience, the Project includes other ecological and watershed restoration activities. Table 3 summarizes the range of different types of management activities that will be evaluated in the MAC Forest Project EIS. Treatment types in any given area will be planned based on actions needed to better align the site with desired conditions.

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<sup>2</sup> <https://www.planscape.org/>

**Table 3. Range of Management Activities**

Proposed Activity	Description
<p><b>Forest Thinning</b></p>	<p>Forest thinning will be implemented to reduce fuel loads, reduce stand densities, and increase forest compositional, age class, structural, and distribution heterogeneity across the landscape.</p> <p>Depending on existing and desired conditions, some forest thinning treatments will focus on removing trees from the lower canopy to reduce ladder fuels while retaining larger overstory trees. Other treatments will include variable density thinning, which creates a mosaic of individual trees, clumps of trees, and openings to enhance stand resilience to disturbances and to create structural heterogeneity. Some treatments may be designed to improve stand survival and health through the removal of unhealthy overstory trees. Forest thinning may also include the removal of existing standing dead trees. Upper diameter-at-breast-height (DBH) limits for forest thinning will be evaluated in the Project EIS and will vary depending on habitat type, tree species, management objectives, and other site-specific ecological factors.</p> <p>Forest thinning will include <b>mechanized timber harvesting</b>. Where the terrain allows (stable soils and non-steep slopes), ground-based timber harvest will be conducted using conventional logging equipment such as feller bunchers and tracked or rubber-tired skidders. On steep slopes and as needed to meet soil quality standards and to control erosion, mechanized operations will be limited to equipment such as low-ground-pressure tracked equipment or tethered operations. Timber harvest on steep slopes may, under certain prescribed conditions, utilize aerial-based methods including cable and helicopter logging.</p> <p>In areas with restrictions that limit mechanical treatments, including areas with sensitive resources, <b>manual treatments</b> will be used for forest thinning. Manual forest thinning will include the hand-cutting of shrubs and trees, typically up to approximately 12 inches DBH, with chainsaws. Larger trees will be limbed to appropriate height based on slope and vegetation to be retained in understory.</p> <p>Cut material from forest thinning may be placed in piles for future pile burning. Lop and scatter may be implemented in some areas, where appropriate. Alternatively, cut material may be processed using a tow-behind chipper or tracked chipper and support equipment, if needed, such as excavators for feeding the chipper. Chips may be removed or may be left onsite in accordance with Project management requirements.</p> <p>Removal of wood products, including cut sawlogs and biomass, will be implemented in conjunction with forest thinning, wherever feasible, as described below.</p> <p>After forest thinning is completed, the Project will also include follow-up treatments to create and maintain desired conditions, which may include prescribed fire, targeted grazing, or other Project actions.</p>
<p><b>Removal of Wood Products</b></p>	<p>Whenever feasible and economically viable, removal of wood products will be implemented along with forest thinning and will include the following:</p> <p><b>Commercial Timber Harvest:</b> Sawlogs will be hauled to sawmills and sold. This will generate revenue to offset some Project costs, provide jobs and forest products, and store carbon in solid wood products.</p> <p><b>Biomass Transport Offsite:</b> Biomass, which includes wood chips, small-diameter trees or brush, and other material that is not merchantable as sawtimber, will be hauled offsite to a biomass facility for energy production and/or for other uses.</p> <p><b>Biomass Disposal Onsite:</b> Wood products may be retained onsite and disposed of using kilns, air curtain burners, portable biomass units, and/or other equipment. Kilns combust biomass in a high-heat, low-oxygen environment that</p>

Proposed Activity	Description
	<p>produces biochar and other usable products, while releasing less smoke, particulates, and carbon dioxide emissions than pile burning (Puetzman et al. 2020).</p>
<p><b>Mechanical Fuel Treatment</b></p>	<p>Mechanical fuel treatments will be implemented in conjunction with other Project actions to rearrange fuels on the landscape to better prepare the area for wildfire resilience and prescribed burning strategies. Mechanical fuel treatments will include the following actions:</p> <p><b>Machine Piling:</b> Equipment may be used to push slash resulting from other forest treatments into piles for future burning. Machine piling will minimize soil disturbance and prevent the accumulation of dirt in the piles.</p> <p><b>Mastication:</b> Mastication creates an altered fuel type that does not necessarily reduce the quantity of fuels in the short term but rearranges them on the ground where decomposition may be accelerated and where they may be manageable in the event of wildfire. Mastication can convert ladder fuels to ground fuel, thereby reducing the risk of future crown fire.</p> <p>A mechanical masticator will be used to grind, chip, and shred vegetation onsite. Whenever feasible or warranted by resource concerns, equipment that minimizes ground disturbance will be used, such as rubber tracks rather than rubber-tire vehicles or metal tracks and articulating booms. Multiple cutting attachments will be used to adapt to the fuel type and terrain.</p> <p>A tethered mastication system may be used on steep slopes and in accordance with soil standards. In areas adjacent to roads, a “reach-in and grab” mastication system may be used. This system keeps the masticator on the road while the arm reaches off the road to remove or masticate adjacent vegetation and ladder fuels. Masticated debris will be broadcast across the treatment area, mulched into the soil, or piled for burning. In contrast to “traditional” mastication, which leaves shredded material on the soil surface, mulching-type mastication mechanically incorporates shredded material into the surface of the soil with the masticating head. Mulching mastication will be prohibited on shallow soils, and may not be beneficial in all situations.</p>
<p><b>Prescribed Fire</b></p>	<p>Prescribed fire will be used to reduce surface fuels, reduce risk of large, high-severity wildfire, protect wildlife habitat, and improve wildfire management operations.</p> <p>When feasible and safe prescribed fire will be implemented using the following methods:</p> <p><b>Pile Burning:</b> Woody material such as limbs, stems, cut boles, and other slash will be piled and then covered (if needed to keep pile dry) with polyethylene plastic or alternate material, and subsequently burned. Piles will be placed away from drip lines of retained trees and away from large logs or stumps whenever possible. Piles will be of various sizes, from large piles at landing from harvest operations up to a quarter acre in size, to moderate sized machine generated piles, to small/smaller hand piling units.</p> <p><b>Broadcast Burning:</b> Broadcast burning of existing understory fuels will be implemented to reduce fuel loads, increase understory productivity and diversity, and allow fire to perform its natural ecological role. During broadcast burning, fire will be carried across a pre-identified portion of the landscape to burn surface fuels, while preserving overstory trees. In some areas, understory broadcast burning will be used as a follow-up treatment after forest thinning and/or mechanical fuel treatments. In these cases, low-intensity broadcast burning will ideally occur 1–3 years following the initial treatments and will help to maintain desired fuel conditions. In other areas that can be safely burned with low-intensity fire without first needing significant fuel treatments, broadcast burning may be used as the primary treatment. Burning may be used to improve or maintain habitat for target plant species.</p>

Proposed Activity	Description
	<p><b>Cultural Burning in Collaboration with Tribes:</b> USFS will collaborate with tribes to consider and potentially implement cultural burning, which uses fire as a tool to restore balance to the land and to cultivate resources. Cultural fire was and is considered critical by tribes to cultivate materials and foods that are essential to centuries-long traditions and resource stewardship. Cultural burning can also moderate wildfire intensity and reduce risk to communities. The objectives of cultural burns include enhancing and increasing the abundance of species used for subsistence foods, material culture, and ceremony as well as to mitigate the spread of wildfires (Adlam et al. 2021; Schelenz 2022; Senos et al. 2006).</p>
<p><b>Hazard Tree Removal</b></p>	<p>Hazard tree abatement will be implemented to improve safety in the Project Area, including where needed to facilitate safe project implementation. Hazard trees are weak and high-risk trees of all sizes, including dead or dying trees, dead parts of live trees, or unstable live trees that due to structural defects or other factors have the potential to cause injury, damage property, and/or block ingress/egress.</p> <p>Hazard tree removal abatement will be implemented in the Project Area in accordance with the following steps:</p> <p>Hazard trees will be identified by USFS staff who have completed the regional hazard tree training program and who are able to identify hazard trees based on the most current regional standards and direction for hazard tree identification and abatement (currently Angwin et al. 2022). If guidance documents are updated or superseded, NF staff will be required to adhere to that updated direction for identifying hazard trees.</p> <p>USFS will identify, fell, and remove hazard trees up to 1.5 times the tree height striking distance to a target within the potential failure zone along target roadways, recreation areas and trails, access routes, other critical infrastructure, and other specific areas that will be defined in the Project EIS.</p> <p>Safe and efficient operations may require the incidental removal of trees that are not within striking distance of a target, but need to be removed because they are hazards for workers or to allow operability of other actions being proposed—e.g., for landings or skid trails during forest thinning.</p> <p>Removing trees may require skidding logs or trees to landing areas for processing and loading on trucks. Landings will be selected from existing impacted areas or constructed as needed where hazard tree removal operations occur. As ground conditions permit, log skidding will avoid remaining trees that are not hazards, seedlings, or regenerating trees. Where skidding occurs, logs must be skidded with the leading end suspended off the ground. Skidding distances will be limited to the minimum length necessary to safely reach the road, landing, or access point to load onto trucks. End-lining may be used to winch logs out of special management areas.</p> <p>In some situations, hazard trees may be felled to abate the immediate hazard but then left onsite if removal would result in impacts to cultural or other sensitive resources, such as nest stands.</p> <p>The Eldorado NF has completed a separate NEPA review for the Eldorado National Forest Roadside Hazard Tree Mitigation Project (USFS 2023c), which covers removal of hazard trees on approximately 109,553 acres of Eldorado NF property, located within a 200-foot buffer along approximately 2,461 miles of roadway, including portions of the Project Area. The Stanislaus NF has drafted a Hazard Tree Management Environmental Assessment (USFS 2023d) that would cover removal of hazard trees along level 2-5 roads, trailheads, and adjacent to facilities across the forest. The EIS for the MAC Forest Project may address additional hazard tree removal needs within the Amador and Calaveras Ranger Districts, or it may be determined that other existing, or forthcoming, decisions provide necessary coverage.</p>

Proposed Activity	Description
<p><b>Fuel Break Construction</b></p>	<p>USFS will construct and maintain a strategic network of shaded fuel breaks to moderate fire behavior, support prescribed fire and wildfire operations, and facilitate safer work conditions for firefighters. Fuel breaks are strips or appropriately sized blocks of land on which the vegetation, debris, and litter have been reduced and/or modified to control or diminish the spread of fire.</p> <p>Fuel breaks will be located along strategic ridges and roads adjacent to critical infrastructure, ownership boundaries, administrative sites, and recreation sites, and may connect with the existing fuel break network on NF lands and adjacent areas. Fuel breaks will be constructed to widths generally between approximately 250 feet up to approximately 1,000 feet). In these areas, a combination of proposed treatments, including forest thinning, mechanical fuel treatments, prescribed fire, targeted grazing, and invasive plant treatments, may be implemented to create a vegetative arrangement that removes ladder fuels so fire cannot easily spread to tree or shrub canopies and reduces the vertical and horizontal continuity of understory vegetation. The proposed action will include the construction and maintenance of new fuel breaks, as well as the maintenance of existing fuel breaks.</p>
<p><b>Invasive Species Treatments</b></p>	<p>The Project includes treatment of invasive species to reduce fuel loads and for other ecological benefits. Invasive species treatments will include the use of the following <b>Integrated Pest Management (IPM)</b> tools:</p> <ul style="list-style-type: none"> <li>• <b>Manual Control/Cultural Methods:</b> This approach includes the use of hand pulling and hand tools, including shovels, picks, weed pullers, loppers, and hand saws. This also includes flaming with propane torches, tarping, hydro-mulching, reseeding with competitive native species, and other physical and cultural treatments.</li> <li>• <b>Biological Control:</b> Biological control methods would release biocontrol agents registered with Animal and Plant Health Inspection Service and the State of California to treat invasive plant species.</li> <li>• <b>Chemical Control:</b> This approach includes the use of herbicide through cut stump treatment, wiping onto foliage, drizzling, directed foliar spraying, broadcast application, and spot spraying. Herbicides and associated surfactants will be used in conjunction with manual/cultural methods for invasive plant management at locations where their use is more effective, provides for worker safety, results in reduced impacts or disturbance when compared to other treatment options, reduces management costs, and/or is integral for the successful management of invasive species populations. The Project EIS will identify a suite of management requirements for herbicide use that define restrictions and specifications to ensure their use is compatible with the protection of sensitive resources.</li> <li>• <b>Targeted Grazing:</b> Targeted grazing uses livestock grazing animals to consume, break off, or trample vegetation to reduce the amount or density of fuels. With targeted grazing, grazing contractors will operate under USFS direction and monitoring to achieve specified fuel-reduction objectives. Grazing can be a relatively inexpensive treatment method, and goats, sheep, and cattle can effectively create fuel reduction zones (Lovreglio et al. 2014). Virtual fencing may be used as a component of targeted grazing, which may make cattle grazing for maintenance of fuel breaks and other treatment areas an effective tool where active allotments already exist.</li> </ul> <p>The Eldorado NF has existing NEPA coverage for invasive plant treatments under the Eradication and Control of Invasive Plants Project (USFS 2013). The MAC Forest Project will include additional areas and treatment options for invasive species in the Eldorado NF and Stanislaus NF within the Project Area.</p>

Proposed Activity	Description
<p><b>Ecological Restoration</b></p>	<p>Forest ecological restoration will be supported by many of the management activities described elsewhere in this table, including, but not limited to, forest thinning, prescribed fire, and invasive species treatments. In addition to these restoration activities, the Project will also include the following activities that may be implemented for ecological restoration:</p> <p><b>Upland restoration</b> of degraded sites, including non-system roads, areas with historical logging impacts, dispersed recreation sites, and areas with historical grazing impacts, may be implemented, as needed, to repair erosional sites and otherwise correct impaired areas, improve surface water infiltration and hydrologic connectivity, remove debris, treat invasive species, protect bare soil, increase ground cover, revegetate with native plants, and implement other restoration actions, as applicable. This may also include the physical blocking of access points that may currently provide unauthorized vehicle access to sensitive areas.</p> <p><b>Aspen Stand Maintenance and Improvement:</b> Targeted removal of encroaching conifers may be implemented in some aspen stands in the Project Area to reestablish the historical aspen stand edge, enhance stand function, increase the diversity of age classes, and promote aspen growth. Girdling of conifers may be implemented in some situations, as applicable, when tree removal is infeasible and/or to create snag habitat.</p> <p><b>Meadow Improvements:</b> In some meadows with encroaching conifers, targeted conifer removal may be implemented to reestablish the historical meadow edge and enhance meadow function. In meadows with trails or roads, especially wet meadows, target trails and roads may be rerouted and/or redesigned, where feasible, to reduce impacts to meadow habitat and to improve hydrologic function. Girdling and/or hinging of conifers may be implemented in some situations, as applicable, when tree removal is infeasible, to create snag habitat, and/or to create a natural barrier with a cut tree.</p> <p><b>Revegetation:</b> In some areas, active revegetation may be implemented to increase understory plant diversity, reduce erosion, and provide other ecological benefits. Revegetation may be implemented by spreading native seed or by planting native species, either as cuttings (willow), bare-root stock, or potted plants. Seeds or other propagules used in revegetation may be collected from local and/or regional locations to preserve genetic diversity and local genotypes and to prevent introduction of pathogens. This management activity may also include the collection of native plant material from within the Project Area to be used for revegetation.</p> <p><b>Temporary Fencing:</b> To prevent damage to young plants from browsing animals, temporary fencing will be installed around aspen stands and other areas, as needed, to support survival and regeneration of desirable vegetation.</p> <p><b>Watershed Restoration:</b> The Project may implement a suite of aquatic and upland restoration techniques, which will be applied as appropriate based on site-specific needs and may include the following.</p> <ul style="list-style-type: none"> <li>• Where applicable, <b>process-based stream restoration techniques</b>, such as post-assisted log structures, beaver dam analogues, large wood or rock placement, rock and log riffle construction, vegetation plantings, and/or other process-based approaches may be used to improve degraded aquatic sites such as gullies, head-cuts, disconnected floodplains, and incised stream channels. Additionally, at some incised stream channel sites, as appropriate, pond and plug, channel fill, and other restoration techniques may be implemented to restore hydrologic function, increase infiltration, and raise groundwater levels in adjacent areas. Grade-control structures may also be installed and/or reinforced, as needed, to stabilize stream reaches.</li> <li>• <b>Riparian Improvements:</b> Willows, rushes, sedges, native riparian hardwoods, and/or other native plants may be planted as appropriate for streambank stabilization, habitat enhancements, and other ecological benefits. Additionally,</li> </ul>

Proposed Activity	Description
	<p>targeted removal of conifers may be implemented in riparian areas to reduce competition with riparian hardwoods, shrubs, forbs, and graminoids. In some riparian areas, treatments may include vegetation thinning to create openings for wildlife habitat along stream margins.</p> <ul style="list-style-type: none"> <li>• <b>Habitat improvement modifications</b> may be implemented at strategic sites to benefit special-status wildlife such as western pond turtle and other species, including, but not limited to actions such as vegetation thinning along shorelines and placement/anchoring of shoreline large wood to provide basking habitat, installation of riparian plantings for cover, strategic forest thinning to benefit egg-laying habitat near ponds, and other habitat improvements.</li> <li>• In addition to the road improvements that may be completed as part of Project to allow access for treatments (described below), improvements may also be implemented along USFS roads specifically for ecological restoration, including <b>aquatic organism passage improvements</b>, culvert replacement or repair, erosional site corrections, and other improvements to water control features to provide watershed benefits.</li> </ul>
<p><b>Maintenance</b></p>	<p>The Project includes implementation of a range of actions designed to modify undesirable forest conditions and shift the Project Area toward desired conditions. In addition to initial treatments, the proposed action may also include maintenance treatments, as needed and as informed by monitoring of the Project Area, to sustain desired conditions. Maintenance treatments may include returning to treatment areas to implement additional management activities, including forest thinning, mechanical fuel treatments, prescribed fire, invasive species management, and targeted grazing, as follow-up treatments to maintain desired conditions.</p> <p>In addition to being used for invasive plant management, herbicides may be used for maintenance of fuel breaks, where resprouting shrubs and other native and non-native vegetation may undermine the effectiveness of initial treatments and prevent the establishment of desired conditions. Management requirements will be assessed in the Project EIS to define the constraints on use of herbicides for the Project, including for fuel-break maintenance.</p>
<p><b>Access for Treatments</b></p>	<p>The MAC Forest Project includes actions to ensure ongoing access for implementation and maintenance of treatments. The following actions may be implemented at USFS roads, access routes/skid trails, and landings to maintain necessary access:</p> <p><b>Road Maintenance and Repairs:</b> Pre-existing designated roads will be maintained and repaired to provide access to treatment areas and provide for safe and efficient haul of forest products, in accordance with applicable best management practices. Maintenance activities may include blading; brushing; removal of roadside hazard trees; repair and/or replacement of road surfaces; cleaning, repair, or installation of drainage structures such as culverts, ditches, and dips; dust abatement; removal and installation of closure barriers; and installation or repair of signs. Road maintenance activities generally do not disturb the ground outside the existing road prism.</p> <p><b>Reconstruction of Previously Used Access Routes/Skid Trails:</b> Reconstruction may occur on existing access routes, roads, or skid trails that were previously blocked, overgrown, closed, or decommissioned and have not been periodically maintained. Existing skid trails will be used when possible. Reconstruction activities may include surface improvements; blading; removing vegetation growing into the road; constructing ditches, culverts, waterbars, drainage dips, riprap fills, or other stabilization features with potential disturbance outside the established roadway; realignment; and widening of curves as needed for access. Following their use for the Project, skid trails that were previously closed or decommissioned will be returned to their pre-project condition and status.</p>

Proposed Activity	Description
	<p><b>Temporary Access Route Construction:</b> Temporary access route construction includes the construction of new temporary access routes and/or the improvement of existing temporary access routes, followed by decommissioning after the intended use period is over. Temporary access routes are generally short, around 250 feet or less, and are intended to provide short-term access to landings on undisturbed terrain within forest treatment areas where the existing system roads do not provide adequate access. Temporary access routes are used to provide safe access and to shorten skidding distances during harvest operations. On occasion, a temporary access route may also be needed to provide access to other mechanical treatment areas. Construction of temporary access routes may occur on slopes less than 10% and include clearing of trees and brush, stumps, rock, and other materials; grubbing; surface blading; spot placement of gravel; and improvement or installation of drainage structures and erosion control, as needed.</p> <p><b>Landing Use and Construction:</b> Landing construction includes the creation of wide spots to safely facilitate yarding, log and/or biomass processing, log and/or chip loading, and hauling. Previous landings and other previously disturbed areas will be used whenever feasible. All landings will be located at stable locations, such as ridge tops, stable benches or flats, and gentle-to-moderate side slopes, where possible. Use of previous landings may include widening and additional vegetation clearing. After use, landings will be decommissioned by ripping, water barring, seeding with native seed mix ((seed mix will be approved by USFS botanist) and/or mulching, and access points will be blocked. If needed for multiple operating seasons, landings will be mulched and entrances will be blocked prior to each wet season until final decommissioning.</p>
<p><b>Forest Plan Amendments</b></p>	<p>The Project EIS will evaluate project-specific forest plan amendments, which may better achieve the purpose and need of the Project, to adopt the management approaches and conservation measures presented in the Conservation Strategy for the California Spotted Owl in the Sierra Nevada (USFS 2019b).</p> <p>Unlike current Forest Plan direction pertaining to California spotted owl, which originates from the 2004 Sierra Nevada Forest Plan Amendment and which presents management guidance focused on retaining suitable habitat and minimizing disturbance to breeding California spotted owl, the 2019 Conservation Strategy for the California Spotted Owl in the Sierra Nevada recognizes that vegetation management has the potential to increase forest resilience at the landscape scale—including vegetation management that in some instances may reduce California spotted owl habitat quality in the near term but preserve long-term sustainability of spotted owl habitat by promoting additional, future, spotted owl habitat.</p> <p>To accomplish this balance of short-term disturbance with long-term conservation, the 2019 Conservation Strategy for the California Spotted Owl includes recommended management approaches and conservation measures that provide some immediate stability for individual owls while allowing landscape treatments to occur.</p> <p>A summary of the considerations for potential Forest Plan amendments related to the California spotted owl is provided in Table 4.</p>

**Table 4. Potential California Spotted Owl Forest Plan Amendments**

Existing Direction <sup>1</sup>	Potential Forest Plan Amendments
<b>Designation of PACs</b>	
<p>PACs encompass the best available 300 acres of habitat surrounding known and suspected nest stands. As additional nest locations and habitat data become available, boundaries of PACs are reviewed and adjusted as necessary. PACs are maintained regardless of California spotted owl occupancy status. However, after a stand-replacing event, habitat conditions are evaluated within 1.5-mile radius around the activity center to identify opportunities for re-mapping the PAC. If there is insufficient suitable habitat for designating a PAC within the 1.5-mile radius, the PAC may be removed from the network.</p>	<p>Amendments may provide an updated protocol for the retiring of existing PACs and territories based on long-term lack of occupancy criteria.</p>
<b>Management in PACs</b>	
<p>Current direction generally stipulates that mechanical vegetation treatments should avoid PACs to the greatest extent feasible and, when necessary, should focus only on the removal of surface and ladder fuels within WUI defense zones and in some cases in WUI threat zones.</p>	<p>Amendments may expand treatment options within PACs to broaden the use of mechanical treatments, prescribed fire, and hand treatments. Amendments may allow treatments to be prioritized in areas with the highest wildfire risk, including within PACs.</p> <p>Rather than avoiding management activities within PACs, amendments would allow for vegetation treatments to increase long-term forest resilience that may result in some temporary reduction in limited areas of California spotted owl habitat quality.</p>
<b>HRCAs or Territories</b>	
<p>Existing forest plan direction includes language for establishing an HRCA surrounding each detected territorial spotted owl activity center on Forest Service lands or on adjacent non-Forest Service lands. An HRCA is defined as 1,000 acres of best available contiguous habitat within 1.5 miles of the activity center.</p>	<p>Amendments will remove HRCA language and instead refer to "territories." A territory would represent a 1,000-acre circle, which includes the 300-acre PAC, surrounding territorial owls, centered on a documented nest site or roost site if nest location is unknown or central point of repeated daytime detections when neither nest nor roost locations are known. Territory boundaries may be adjusted to be non-circular, up to 1.5 mile from the most recent Activity Center, to include the entire PAC and the most sustainable areas of high-quality habitat and exclude areas less likely to support suitable habitat. Territories would be managed to foster development of high-quality habitat, promote habitat connectivity at the watershed scale, and increase resiliency at the watershed scale.</p>

Existing Direction <sup>1</sup>	Potential Forest Plan Amendments
<b>Survey Requirements</b>	
When activities are planned within or adjacent to a PAC, surveys are required to establish or confirm the location of the nest or activity center, if uncertain.	Amendments may clarify survey requirements and may eliminate the requirement to conduct pre-implementation surveys outside of established PACs for vegetation treatments that maintain or improve habitat quality in California spotted owl nesting and roosting habitat.
<b>LOPs</b>	
LOPs are applied during the breeding season, which in general prohibits all vegetation treatments within approximately ¼ mile of PACs unless surveys confirm that California spotted owls are not nesting. The LOP restrictions may be waived, where necessary, for use of early season prescribed fire in up to 5% of California spotted owl PACs per year on a NF.	LOPs will generally be maintained to provide a ¼ mile non-disturbance buffer around PACs during the breeding season. However, amendments may allow broadened use of prescribed burning in relation to PACs during the breeding season.

<sup>1</sup> Current California spotted owl guidance for the Project Area is found in the Sierra Nevada Forest Plan Amendment Final Environmental Impact Statement (USFS 2004) and Stanislaus National Forest Plan Direction (USFS 2017).

## 5.2 Preliminary Management Requirements

Management requirements are mandatory components of a proposed action that must be adhered to during implementation. Management requirements are often focused restrictions, constraints, or retention requirements and are included for protection of resources and to ensure compliance with applicable laws, regulations, and policy.

Table 3 provides a preliminary list of the types of management requirements that will be included as part of the proposed action. This list is not intended to include all requirements and standards that will be included in the Project EIS, but rather to convey the range of the types of requirements and standards likely to be included in the EIS. These are organized by the resource that the management requirement is intended to protect and/or by type of Project activity to which management requirements may apply. Through the Project EIS and planning process, it is anticipated that this list of preliminary management requirements will be refined and additional management requirements will be developed and included. As described previously, the Project will be implemented in a staged approach over a period of approximately 10 years or longer. The Project's management requirements will include guidance on the evaluation process required for individual planned treatment areas to assess current site conditions and resource considerations. Based on the results of the site-specific evaluation, all applicable management requirements described in the Project EIS will be applied to individual actions to protect resources.

**Table 5. Preliminary Management Requirements**

Resource or Activity	Management Requirement Considerations
<b>Resource-based Requirements</b>	
<b>Standard Requirements</b>	
<b>Standard Requirements</b>	Unless approved under a Project-specific Forest Plan amendment, all Project actions will comply with all applicable USFS standards and requirements, including the Eldorado National Forest Land and Resource Management Plan (USFS 1989) or Stanislaus National Forest Land and Resource Management Plan (USFS 1991), as amended by the 2004 Sierra Nevada Forest Plan Amendment (USFS 2004). The Project will incorporate applicable best management practices for water quality management on NF System lands (USFS 2012). In addition, the Project will adhere to other applicable, standard policies and guidelines included in various Forest Service handbooks, laws, and regulations.
<b>Air Quality</b>	
<b>Air Quality</b>	Potential air quality impacts will be minimized through a number of requirements designed to reduce dust and minimize emissions from equipment, vehicles, and prescribed fire.

Resource or Activity	Management Requirement Considerations
<b>Aquatic Resources/Water Quality</b>	
<b>Aquatics</b>	All Project activities will be consistent with standard USFS Riparian Conservation Objectives (USFS 2004). To protect water quality and aquatic habitat, protective buffers will be established in areas around aquatic resources. In protected aquatic buffer areas, there will be specified exclusions, limitations, and/or restrictions that will apply. Guidance and/or restrictions on work-related activities such as equipment stream crossings or felling hazard trees in the riparian zone may be developed, as applicable
<b>Special-Status Amphibian and Reptiles</b>	The Project Area supports suitable habitat and/or occurrence records for multiple species of special-status amphibians and reptiles, including Sierra Nevada yellow-legged frog, foothill yellow-legged frog, Yosemite toad, California red-legged frog, and western pond turtle. As part of the Project EIS, the Project Area will be evaluated for suitable habitat conditions and potential for occurrence. Management requirements will be developed to ensure the ongoing protection of individuals and habitat of these species during Project implementation. The Project will also include actions designed to improve habitat for these species.
<b>Botanical Resources</b>	
<b>Botany</b>	Prior to implementation of Project actions in any given area, a botanical resource specialist will be consulted regarding potential special-status plants, site-specific invasive plant risks, survey/monitoring needs, and management requirements. Based on this analysis, applicable management requirements for special-status plants and/or invasive plants will be selected from the Project EIS and applied during implementation.
<b>Invasive Plants</b>	The Project will include a suite of requirements to avoid and minimize invasive plant impacts.
<b>Lava Caps/Sensitive Botanical Areas</b>	The Project will avoid impacts to volcanic (lava caps), alpine pin-cushion, and granitic openings and outcrops.
<b>Stump Treatments</b>	A registered borate compound may be applied to freshly cut stumps to limit the spread of annosus root disease and to reduce the risk of new infection centers developing. This will be done in accordance with all applicable rules and regulations.
<b>Vegetation Retention</b>	Vegetation treatments will include treatment specifications to promote desired conditions and to protect and maintain habitat quality and diversity. These specifications will include the selective protection and retention of target species.
<b>Prevention of Unauthorized Vehicle Access</b>	The Project will include measures to prevent vehicle access into unauthorized areas, including fuel breaks or sensitive habitats.
<b>Cultural Resources</b>	
<b>Cultural Resources</b>	The Project will utilize management and protection measures for cultural resources and historic properties as well as tribal consultation protocols set forth in the Programmatic Agreement Among the USDA Forest Service, Pacific Southwest Region (Region 5), California State Historic Preservation Officer, Nevada State Historic Preservation Officer, and the Advisory Council

Resource or Activity	Management Requirement Considerations
	on Historic Preservation Regarding the Process for Compliance with Section 106 of the National Historic Preservation Act for Management of Historic Properties by the National Forests of the Pacific Southwest Region (USFS 2020b).
<b>Infrastructure</b>	
<b>Infrastructure Protection</b>	Infrastructure that is damaged, removed, or otherwise affected by the Project will be repaired and/or returned to pre-implementation conditions in a timely fashion. This includes roads, waterbars, recreation sites, fences, land survey monuments, property boundary markings, trailhead parking facilities, and other improvements. Trails will be cleared of felled material and slash.
<b>Range Resources</b>	The Project will prevent damage to rangeland infrastructure including fences, water developments, and cattleguards. If any range improvements are damaged during implementation, they will be repaired to Forest Service standards.
<b>Public Safety</b>	
<b>Public Outreach for Prescribed Fire and Smoke Emissions</b>	The Project will include smoke messaging outreach and will actively plan, communicate, and manage burning operations and associated smoke emissions to limit negative effects to populated areas and other sensitive areas.
<b>Recreation, Traffic, and Public Safety</b>	Warning signs will be posted in work areas, including all access points along trails and roads, to alert oncoming traffic and recreational users to safety hazards associated with the Project. Treatment timing may be coordinated to minimize conflicts with recreation use. Public notification with Project implementation updates will be provided at routine intervals. Methods may include news releases; website and social media updates; and area newsletters.
<b>Soil Resources</b>	
<b>Vegetation Retention</b>	Vegetation treatments will include treatment specifications to promote desired conditions and to protect and maintain habitat quality and diversity. These specifications will include requirements for retention of soil cover, such as unburned or partially consumed duff, needle fall, basal live plant cover, fine woody debris, and downed logs.
<b>Equipment Restrictions</b>	<p>The Project EIS will specify management requirements related to equipment use, such as the following:</p> <ul style="list-style-type: none"> <li>• Restrictions on the use of mulching-type mastication to protect shallow soils.</li> <li>• Requirements for mastication, including limits to length and depth of vegetative debris created through mastication.</li> <li>• Restrictions on the use of different types of equipment (e.g., rubber-tired or tracked equipment, loaders/yarders, dozers, masticators) based on % slope.</li> <li>• Restrictions on operation of equipment in areas with saturated soil conditions.</li> </ul>

Resource or Activity	Management Requirement Considerations
<b>Specially Designated Areas</b>	
<b>Inventoried Roadless Areas</b>	The Project Area includes some areas that are designated as Inventoried Roadless Areas (IRAs) (Map 2). The Project will avoid activities that could substantially alter the undeveloped character of inventoried roadless areas.
<b>Wild and Scenic Rivers</b>	Portions of the Mokelumne River in the Project Area are designated as part of the California Wild and Scenic Rivers System. The Project EIS will include restrictions on temporary road construction and other actions, as applicable, within specified buffers surrounding eligible wild and scenic rivers.
<b>Proposed Wilderness Areas</b>	The Amador Ranger District includes the proposed Caples Creek Wilderness Area within the Project Area. The Project will avoid activities that could substantially alter the undeveloped character of proposed wilderness areas.
<b>Wilderness Areas</b>	The Project Area does not include any designated wilderness areas. No Project actions will be proposed in designated wilderness areas.
<b>Wildlife</b>	
<b>Wildlife</b>	<p>Prior to implementation of Project actions in any given area, the site will be evaluated and surveyed, in compliance with applicable survey protocols (consistent with Eldorado NF and Stanislaus NF Forest Plan direction) to establish or confirm current locations of special-status species and sites, such as nest activity centers and roost sites for California spotted owl, great gray owl, and American goshawk. Based on the results of the evaluation, applicable management requirements will be applied.</p> <p>A USFS biologist will be notified if any federally listed or Region 5 Forest Service Sensitive species are discovered during Project implementation so that protective measures can be applied, if needed.</p>
<b>California Spotted Owl and American Goshawk</b>	<p>California spotted owl and American goshawk are known to reside and breed in the Project Area. As part of Project planning and EIS development, Project -specific measures will be developed to protect individuals and habitats for these species.</p> <p>Additionally, there may be Project -specific Forest Plan amendments included as part of the Project.</p>
<b>Forest Habitat</b>	<p>Vegetation treatments will include treatment specifications to promote desired conditions and to protect and maintain habitat quality and diversity. These specifications will include the following:</p> <ul style="list-style-type: none"> <li>• The Project EIS will define and evaluate upper DBH limits for forest thinning. Upper DBH limits may vary depending on forest habitat characteristics, tree species, and management objectives.</li> <li>• The Project will include canopy cover retention requirements, snag and down log retention requirements, and understory vegetation retention requirements for different site conditions, habitat types, management objectives, and treatment specifications.</li> </ul>
<b>Activity-Based Requirements</b>	
<b>Prescribed Fire and Smoke Emissions</b>	Prescribed burn units will be designed and implemented following national rules and guidelines, including National Wildfire Coordinating Group's (NWCG's) Smoke Management Guide for Prescribed Fire (PMS 420-3)

<b>Resource or Activity</b>	<b>Management Requirement Considerations</b>
	(NWCG 2020), Standards for Ground Ignition Equipment (PMS 443) (NWCG 2019a), Standards for Transporting Fuel (PMS 442) (NWCG 2019b), Interagency Prescribed Fire Planning and Implementation Procedures Guide (PMS 484) (NWCG 2017), and Prescribed Fire Plan Template (PMS 484-1) (NWCG 2018).
<b>Herbicide Use</b>	The Project will include management requirements related to herbicide use. Application of herbicides will occur in accordance with all applicable rules and regulations and in coordination with the appropriate county agricultural commissioner(s).
<b>Targeted Grazing</b>	The Project will include management requirements for targeted grazing, including coordination with current active range allotment holders.

## 6 Impacts

The Project EIS will evaluate both the effectiveness of the proposed action and action alternatives at meeting the purpose and needs of the Project and the potential environmental consequences of the proposed actions in comparison to the no action alternative. The EIS will focus the analysis to address the significant issues identified through the public scoping process.

The Project is expected to significantly increase forest health and resilience by reducing the likelihood of high-severity wildfire, reducing stand densities, and increasing forest heterogeneity. Restoration of healthier, more resilient and more fire-resistant forests will reduce uncontrolled emissions and public smoke health impacts from wildfire over the long-term, and also improve growth, lifespan, and carbon storage of residual trees. Surface water quality, supply, and reliability will be protected by reducing fire-induced soil erosion, benefiting local and downstream users, hydroelectric and water supply infrastructure, and special status species.

The consequences of taking no action are high. The area would remain at an elevated risk of high-severity wildfire that would result in forest and wildlife habitat losses and watershed degradation. The treatments proposed to create the desired conditions may cause short-term impacts to sensitive resources, including California spotted owl protected activity centers. Although long-term benefits are expected to far outweigh the risks to resources, a measure of uncertainty is also present regarding potentially significant impacts. The proposed actions will be designed based on best available science and are well supported. However, at present, there are not any documented post-treatment case-studies of the outcomes of the treatments to directly inform the analysis, and thus the uncertainty.

## 7 Acronyms and Abbreviations

CALVEG	Classification and Assessment with Landsat of Visible Ecological Groupings
CFR	Code of Federal Regulations
DBH	diameter-at-breast-height
EIS	environmental impact statement
HRCA	home range core area
FPP	Forest Projects Plan
Forest Service	U.S. Forest Service
IPM	Integrated pest management
IRA	Inventoried Roadless Areas
MAC	Mokelumne Amador Calaveras
MOG	Mature and Old Growth
NEPA	National Environmental Policy Act

NF	National Forest
NOI	Notice of Intent
NWCG	National Wildfire Coordinating Group
LOP	limited operating period
PAC	protected activity center
POD	Potential Operational Delineations
Project	Mokelumne Amador Calaveras Forest Health and Resilience Project
Region 5	Pacific Southwest Region
SDI	stand density index
SR	State Route
UMRWA	Upper Mokelumne River Watershed Association
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
WUI	Wildland Urban Interface

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