

CALIFORNIA TAHOE CONSERVANCY

FOREST IMPROVEMENT PROGRAM GUIDELINES



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TABLE OF CONTENTS

1. BACKGROUND

- a. California Tahoe Conservancy Mission
- b. Forestry Program

2. GUIDING OBJECTIVES

- a. Sustain Adaptive and Resilient Forests
- b. Restore Forest Species Mixture and Structure
- c. Reduce Hazardous Fuels
- d. Protect Wildlife, Wetlands, and Sensitive Areas
- e. Reduce Insect or Disease Outbreaks
- f. Accelerate Restoration Following Catastrophic Events
- g. Remove Hazard Trees

3. FORESTRY PROGRAM PRIORITY AREAS

- a. Defense Zone
- b. Threat Zone
- c. General Forest

4. FOREST IMPROVEMENT

- a. Treatment Methods
- b. Forest Thinning Prescriptions
- c. Wildlife Prescriptions
- d. Archeological Protections

5. FOREST BY-PRODUCTS

- a. Marketable Material
- b. Woodchips
- c. Restoration Materials
- d. Firewood
- e. Biomass

6. MONITORING AND ASSESSMENT

- a. Project Effectiveness Monitoring
- b. Status and Trend Monitoring
- c. Compliance Monitoring

7. PERMITTING AND ENVIRONMENTAL COMPLIANCE

- a. CEQA
- b. Wetlands/SEZ
- c. Water Quality

8. COMMUNITY INVOLVEMENT/PUBLIC PARTICIPATON

1. BACKGROUND

a. California Tahoe Conservancy Mission

The California Tahoe Conservancy (Conservancy) is a State agency with a mission to lead California's efforts to restore and enhance the extraordinary natural and recreational resources of the Lake Tahoe Basin. Established in 1984, the Conservancy's jurisdiction extends throughout the California side of the Lake Tahoe Basin, as defined in California Government Code Section 66905.5. In addition to property acquisition, the Conservancy also develops and implements projects, both directly and through grants to government agencies and nonprofits, to improve water quality, preserve Lake Tahoe's scenic beauty, provide recreational opportunities and public access, preserve wildlife habitat area, and manage and restore lands to protect the natural environment.

b. Forestry Program

The Conservancy's Forestry Program is responsible for managing the agency's forest resources consistent with the Lake Tahoe Basin's Environmental Improvement Program (EIP), the Lake Tahoe Multi-Jurisdictional Fuel Reduction and Wildfire Prevention Strategy and Community Wildfire Protection Plan (10-Year Plan), and California Government Code Section 66907.10, which states, "The Conservancy may improve or develop lands for the purpose of protecting the natural environment or otherwise meeting the objectives of this title."

The Conservancy owns approximately 6,440 acres of land, comprised of nearly 4,900 separate parcels, of which an estimated 5,560 acres are forested and require regular review. Conservancy forested lands vary by stand structure, age and species mixture, property size, and position within or surrounding urban areas. For example, a common forest upland in the south shore area typically contains a higher proportion of Jeffrey pine (*Pinus jeffreyi*) as opposed to the average upland parcel in the west shore area, which typically contains a higher proportion of white and red fir (*Abies concolor* and *Abies magnifica*). Parcels vary in size from a tenth of an acre to hundreds of acres, with the majority in the quarter-acre size range and situated amongst residential structures within the urban area. The topography varies from flat to very steep (80% grade).

The success of the Conservancy's Forestry Program is guided by a multi-disciplinary approach that leads to a sustainable and resilient forest ecosystem. These Program Guidelines will be modified in response to new scientific information, changing technology, and evolving issues.

The Forestry Program coordinates its efforts with Basin partners, including the U.S. Forest Service - Lake Tahoe Basin Management Unit, California Department of Forestry and Fire Protection, Nevada Division of Forestry and local fire districts. These partnerships occur at both the executive and staff levels through

the executives' Multi-Agency Coordinating Group (MAC) oversight of the Tahoe Fire and Fuels Team (TFFT), which is comprised of implementing agency staff. These partners meet regularly to update priorities, projects and plans. In 2014 fifteen partners updated the *Multi-Jurisdictional Fuels Reduction and Wildfire Prevention Strategy* (Strategy). The Strategy facilitates the strategic decisions that must be made by land management, fire and regulatory agencies to reduce the probability of a catastrophic wildfire in the Basin and establishes a process to identify priority projects. The Strategy serves as the guiding document for the TFFT in preparing a yearly Incident Action Plan and performing regular updates to Community Wildfire Protection Plans (CWPP).

2. GUIDING OBJECTIVES

The Forestry Program is guided by the following objectives:

a. Sustain Adaptive and Resilient Forests

As described in the California Natural Resources Agency's "Safeguarding California and Reducing Climate Risk" document, California's forests help absorb carbon dioxide and counteract the greenhouse gas emissions that cause climate change. These forests need protective actions to prepare them to withstand mounting climate threats such as increasing temperatures, drought, increasing risk of pest infestations, and increasing risk of severe wildfires. When adequately protected, forested lands provide many benefits, including absorbing carbon dioxide, which will assist with climate problems. In addition, trees and forests help anchor soil and absorb rain and snowmelt, so flooding and landslides are less severe. Forests also help regulate the timing and magnitude of water runoff and water flows; and they have very significant impacts on water quality, because they provide a filtering function that prevents impurities from entering streams, lakes, and groundwater.

1. Climate Change

Forests play a significant role in climate change mitigation by acting as "sinks," absorbing carbon from the atmosphere and storing it in biomass and soils. However, when forests are cleared or degraded, they are also significant sources of greenhouse gas emissions. Forests, therefore, play an important role in strategies for adapting to climate change.

Climate change places forest ecosystems at risk. Most of the urgent forest and grassland management challenges of the past 20 years, such as wildfires, changing water regimes, and expanding forest insect infestations, have been driven, in part, by a changing climate. Future impacts are projected

to be even more severe. To ensure our forested lands are protected, restored, and made more resilient to the impacts of climate change, we must reduce or adapt to the risks and the unavoidable impacts to our forested systems.

2. *Sustainable and Resilient Forests*

Sustainable forestry provides for multiple uses of the forest by balancing a diversity of both present and future needs. It is a process of informed decision-making that takes into account resource needs, program objectives, site capabilities, existing regulations, economics and the best scientific information available at any given time.

Healthy forest ecosystems sequester carbon dioxide, sustain the health of many of the Region's biological resources, and reduce the risk of wildfire. Protecting forest and biological resources is important for sustainability of the Region's interconnected resources and the Region's identity, and can also result in greenhouse gas emission reductions.

b. Restore Forest Species Mixture and Structure

Prior to extensive depletion of timber resources and subsequent community development, Lake Tahoe forests were in relative equilibrium. These historic forests of Lake Tahoe were quite diverse and contained varied tree species as well as age distribution and stocking levels, and included vast expanses of riparian habitat, open areas and fully functioning meadows. The common denominator which held this system in balance was low intensity fire that burned in relatively small patches. These fires created a mosaic of different conditions across the landscape and maintained tree densities to a point as to be considered sustainable and healthy, which minimized damages from widespread catastrophic fires, insect and disease outbreaks, as well as from drought cycles. There is general agreement that managing for a desired sustainable condition that mimics an historic forest structure to the extent practical, given current land use and constraints, will allow greater resilience into the future as the Sierra Nevada range prepares for the effects of climate change.

c. Reduce Hazardous Fuels

Hazardous fuel removal is essential within and immediately surrounding the community defense zone to protect life and property. Hazardous fuel reduction projects remove smaller trees, while healthier, larger trees are retained for the future stand. Occasionally, larger trees may be proposed for removal when they appear to contain health issues such as insect or disease outbreak (see Insects and Disease). Separation of tree canopies and highly flammable chaparral is

typical and has the benefit of reducing fuel levels to the point where most fires will burn at a lower intensity and are easier to contain.

d. Protect Wildlife, Wetlands, and Sensitive Areas

Certain Conservancy lands are considered more sensitive to human impacts, or are of special value to wildlife, due to their unique placement within the Tahoe Basin or other special resource attribute. Treatments in sensitive areas are lighter on the ground or exclude certain areas since sensitive areas present higher potential resource damages. For example, use of heavy machinery may be limited to upland areas that are not steep because the resource impacts (such as rutting and compaction) from their use are minimal/non-existent post treatment. A typical treatment in a sensitive area typically includes use of hand crews or other light impact techniques.

1. Wetlands and Riparian Areas

Unique riparian habitats, which include riparian trees and natural meadows, are susceptible to conifer encroachment in the absence of fire. Competing conifers over time replace meadow plants or compete with riparian trees and replace these ecosystems with dense thickets which are usually unhealthy and susceptible to insect and disease outbreaks. Competing conifer thickets within riparian corridors also create a fire hazard. In the absence of wildfire, forest improvement will remain important to protect these important natural resources.

2. Wildlife

Coarse woody debris and snags are beneficial for soil replenishment and for numerous animals and plants that live in Lake Tahoe forests. Once a tree dies and decomposes in the form of a snag or downed woody debris, it creates a unique opportunity for feeding, nesting and other functions that create the diverse food chain cycle necessary for wildlife to thrive. Within the wildland-urban interface (WUI) this natural cycle can create a fire and/or safety hazard to adjacent residential and commercial structures. To reduce these hazards to an acceptable level, a balanced approach is necessary in which excess fuels are removed for fire prevention and hazard trees are removed for safety, while at the same time retaining both coarse woody debris and snags where possible.

3. Cultural Resources

Protection of historic and pre-historic activities within Lake Tahoe forests is required as a condition of all forest management activities. Sites requiring

protection are first identified through an Archaeological Assessment, or a literature or database review of available written resource information. This initial literature review is followed by a field assessment to identify known and unknown sites to determine the level of significance.

e. Reduce Insect and Disease Outbreaks

Insects and disease are part of a natural process that slowly or dramatically alters the forest landscape. When insects or disease selectively affect the forest, they help take out weaker trees, thereby favoring healthier dominant tree growth. This process is beneficial, allowing stronger trees to thrive and grow with the limited moisture and nutrient resources available. Wildlife also benefit from limited occurrences of insect or disease attacks because these pathogens are a part of the natural ecosystem creating forest components that many wildlife species use, including dead trees and insects themselves, and encouraging healthier forests.

On the other hand, large scale insect or disease outbreaks are detrimental when a high percentage of trees in a particular forest are susceptible. Large insect and/or disease attacks are started by natural drought cycles, which are common in the Tahoe Basin, or are an indicator of general stress such as overcrowding. In these instances, instead of selectively targeting unhealthy trees, a particular insect or disease can kill most or all of the trees in a given forest stand.

f. Accelerate Restoration Following Catastrophic Events

When fire is excluded far beyond the natural recurrence interval for the area, fuels accumulate in large quantities, and large catastrophic fires are inevitable. Large, catastrophic fires consume most of the forest floor and canopy and in the absence of human intervention, leave the former forest with bare soil, which inhibits natural forest succession. Chaparrals usually dominate for some time, replacing the pioneering grasses and forbs. Tree planting and chaparral removal projects accelerate natural processes and the establishment of trees as the dominant species.

g. Remove Hazard Trees

Hazardous trees can pose a threat to adjacent structures and infrastructure. For public safety reasons, these trees may need to be removed. If the trees are identified as part of a fuel reduction inspection, then they are removed as part of the larger project. Typically trees are identified as part of Staff's inspection program or when a concerned neighbor notifies staff.

3. Forestry Program Priority Areas

Approximately 5,560 acres of the Conservancy's current 6,440 total acres require forest resource management review and possible treatment. About 4,920 acres are general upland forest, 62 acres are riparian trees and/or vegetation, and 578 acres consist of various shrub species, including the more flammable chaparral species.

- a. **Defense Zone:** Projects located in the WUI within the Defense Zone receive the highest treatment priority, followed by projects within the Threat Zone, then general forest lands outside of the WUI. The defense zone is the area that includes the at-risk community extending into the wildland for at least 0.25 mile beyond the community. The intent of fuels reduction in the defense zone is to reduce fuels so that fire occurring during extreme fire weather will burn with 4-foot flame lengths or less as it approaches the community and provide an adequate area for firefighters to engage the fire before it can reach the built environment.
- b. **Threat Zone:** The threat zone is an extension of the defense zone with the important distinction being that not every area within the threat zone may be a priority for fuels treatment. Area treatments within the threat zone are designed to reduce fuels in target areas where fires are known to start, and where a fire start is likely to grow and threaten communities.
- c. **General Forest:** General forest areas are all other lands outside of identified WUI (threat and defense zones) that are not in wilderness. Treatments can be implemented for fuels reduction, forest health, ecosystem resiliency, and to address emergency needs (such as wind throw, salvage, forest insects and disease, etc.) in addition to other management considerations.

4. Forest Improvement

a. *Treatment Methods*

Conservancy forestry projects utilize both mechanical and hand crews to accomplish project goals based on a number of factors which include but are not limited to project size, sensitive resources identified, steepness of the slope as well as location adjacent to the community. Mechanical treatments have the greatest utility within the WUI and on larger parcels where the slopes do not exceed 30 percent and the soil conditions permit. Hand crews are most often used on small parcels within the urban area and on steeper slopes where the use of equipment is either problematic or not permitted.

Larger Conservancy properties outside of the WUI should be treated through forest health thinning followed by long term prescribed burning. Due to

public safety concerns, parcels within, or directly adjacent to, the urban community are not well suited to treatment through landscape level prescribed fires. Management options for smaller parcels may entail forest health thinning followed by phased thinning or piling and burning of smaller slash piles.

b. Forest Thinning Prescriptions:

Due to higher than desired forest stocking densities, Conservancy parcels often require thinning to reduce stocking to more resilient and sustainable levels. Thinning operations use a prescription in which small trees are removed to allow larger, healthier trees room to grow, reducing competition for the limited water and nutrient resources. Larger trees may also be removed as part of a thinning prescription. As the desired condition for stocking levels is approached - typically 50 to 150 square feet of basal area per acre – sustainability can be accomplished through limited thinning and/or reintroduction of fire.

Below is a list of typical Forest Improvement activities:

- A. Remove small trees which live in the understory and larger trees as necessary to allow larger, healthier trees room to grow
- B. Aim for historic stocking range (typically between 50 and 150 square feet of basal area per acre)
- C. Strive for a forest stand at desired stocking levels through thinning and/or reintroduction of fire
- D. Create small forest openings to allow new tree growth, forest structure diversity, and age diversity in forest stands over time
- E. As appropriate, thin large parcels or contiguous ownerships, greater than one acre in size, with long term prescribed burning
- F. As appropriate, thin small parcels through piling and burning of small slash piles
- G. Remove larger trees when they appear to have health issues such as insect or disease outbreak while also taking into consideration its value for providing wildlife habitat
- H. Separate tree canopies from chaparral plant communities
- I. Identify boundaries of riparian habitat through characteristics such as soil type (i.e., changes from heavy clay soil to silt soil) and indicator species (e.g., presence of meadow grasses and sedges, willow and alder)
- J. Protect riparian habitat using methods acceptable to Tahoe Regional Planning Agency (TRPA), Lahontan Water Quality Control Board (Lahontan), and CalFire
- K. Phase treatments every ten years or as appropriate to achieve goals

c. Wildlife Prescriptions:

The Lake Tahoe Basin is home to endangered, threatened, special status, sensitive, and regional indicator species in both the wildlife and biological areas. Care is taken to identify these areas during a project's planning so that adequate protection of them can be planned into a project.

Conservancy staff identify locations of threatened, endangered, special status, and regional indicator wildlife and biological species using the California Natural Diversity Database and surveys as required by federal, State and regional entities.

A. Defense and Threat Zones Wildland-Urban Interface (WUI)

- i. Retain at least two of the largest non-hazardous snags per acre, all snags greater than 30" in diameter at breast height (DBH) and all those greater than 24" DBH in decay Class 6 or higher, meaning broken trees that contain multiple homes, unless they become so numerous as to pose an unacceptable fire risk. Snags may be created by cutting hazard trees or other trees marked for removal to specified height.
- ii. Retain at least three to five of the largest logs per acre in decay Classes 1-3, meaning newly fallen to limbless logs.
- iii. Create coarse woody debris as necessary by leaving the boles of cut trees.

B. General Forest

- i. Retain at least five of the largest non-hazardous snags per acre, all snags greater than 30" DBH and all those greater than 24" DBH in decay Class 6 or higher unless so numerous as to pose an unacceptable fire risk. Snags may be created by cutting hazard trees or other trees marked for removal to specified height.
- ii. Retain at least five to ten of the largest logs per acre in decay Classes 1-3, meaning newly fallen to limbless.
- iii. Coarse woody debris may be created by leaving the boles of cut trees.

C. Riparian/Streamside Zones

- i. Retain all non-hazardous snags greater than 16" DBH and all snags of riparian species unless such snags are so numerous as to pose an unacceptable fire risk or interfere significantly with riparian vegetation and function.
- ii. Retain all logs greater than 16" DBH and 20 feet long, unless so numerous as to pose an unacceptable fire risk or interfere significantly with riparian vegetation.

d. Archeological Protections:

- A. Identify sites requiring protection through an Archaeological Assessment or literature or database review of available written resource information.
- B. Conduct field assessments to identify known and new sites and determine level of significance. If new sites are identified or additional information discovered about a known site, the Archaeological database is updated. Mitigation measures are recommended for each site identified and reviewed by the appropriate regulatory Archaeologist.

5. Forest By-Products

Forestry projects on Conservancy lands typically generate at least one or more by-products. These by-products are used in various ways depending on the type of product generated.

a. Marketable Timber

This is a common by-product of larger acreage mechanical treatments. Timber is removed from the project site by a contractor and taken to a sawmill where it is processed into timber products. This includes products such as 2x4's, plywood, non-dimensional logs, and other products for which a market exists. Revenues from these products can help to offset treatment costs.

b. Woodchips

Woodchips are created from small diameter trees and slash that have been processed by a wood-chipper. Chips are typically removed from the site and taken to a local resource recovery facility to be recycled for compost or taken to biomass facility (cogeneration plant) to be used for alternative energies. For example, the Conservancy worked with Placer County on a project that generated chips which were taken to a cogeneration plant and used to produce power. Sometimes chips are retained on site and broadcast on the forest floor when removal is difficult and not cost-effective. This is only done in upland areas (outside of SEZ and other sensitive resources), and where leaving chips on site doesn't create a heavy fuel load and unacceptable fire risk. Chips may also be used as a restoration material for other Conservancy projects.

c. Restoration Materials

By-products can remain on site and be re-used as material for restoration of areas before, during, and after forestry projects. They can also be used for other Conservancy restoration projects. Logs can be used as fence poles, barriers to block motorized access, and for erosion control. Chips and masticated material is also used to help restore roads, trails, and landings.

d. Firewood

On non-commercial projects, firewood is collected by the public through the community firewood program. This program issues an average of 350 free permits per year to the local community. Each permit is valid for up to two cords of wood for non-commercial uses only. For projects that are commercial, timber is owned by the contractor and can be sold as firewood to help offset treatment costs.

e. Biomass

Biomass is used to generate heat, steam, and electricity and create products such as ethanol, soil amendments, or landscaping material. Biomass can be removed from sites that are mechanically treated on slopes less than 30 percent and then transported to a biomass facility. In 2011 the Conservancy led an effort to develop a Tahoe Biomass Strategy, which described the potential benefits of biomass removal in the Basin. A key element of the strategy is Placer County's Cabin Creek Biomass Facility, anticipated in 2016. Once this facility is constructed, it will provide a cost effective opportunity to use treatment by-products for biomass purposes.

6. Monitoring and Assessment

Monitoring is essential to the forestry program. Some of the most important questions answered through monitoring are:

- What are the short and long-term effects of various forest management techniques?
- How can we gather data to advance the science of forestry or support the use of new technology?
- How effective was the project in meeting its objectives?
- Did we comply with regulatory requirements?

The Conservancy has established monitoring sites for the purposes of conducting Continuous Forest Inventory (CFI) monitoring to assist in understanding the overall condition of Conservancy forests. CFI monitoring provides information documenting trends in forest health, structure, and composition. Analysis of trend data may include such questions as average changes in stand density over time on treated and untreated properties, incidence of forest pathogens over time, and forest structure and composition over time. It is ideal to conduct CFI every ten years or before and after each treatment.

a. Project Effectiveness Monitoring

- Monitor effectiveness of fuel reduction and forest health projects using pre and post-treatment data from CFI plots, aspen transects, or other targeted monitoring protocols. Attributes, metrics, and/or condition information is used to assess the benefits and effects of the project relative to the project's prescription and resource objectives. Additional data may be collected to answer specific questions regarding insect/disease outbreaks, habitat characteristics, or soil erosion/compaction, etc.

- Photograph CFI plot locations and/or other photo points before and after forestry treatments to document the project immediately before and after treatment as well as over longer timeframes.
- Monitor to determine direct and indirect project benefits and impacts to other resource areas, such as wildlife habitat and communities, groundwater and water quality, and special species, such as aspen and sugar pines, from a short term and long term perspective.
- Monitor areas of disturbance to ensure successful stabilization and revegetation.

b. Status and Trend Monitoring

- Monitor trends in forest health, structure, composition, forest pathogen occurrence, etc. through the periodic re-measurement and analysis of CFI plots and other monitoring information.
- Share monitoring data and information with other land management agencies for use in landscape-scale status and trend analysis.

c. Compliance monitoring

- Monitor as necessary to comply with environmental and regulatory requirements.
- Inspect and document the installation and maintenance of best management practices for the protection of water quality and other resources.

7. Permitting and Environmental Compliance

a. CEQA

All Conservancy forestry projects are evaluated under the California Environmental Quality Act (CEQA) and comply with the California Forest Practice Rules, as directed by the California Board of Forestry and implemented through CalFire, the TRPA Code of Ordinances and Regional Plan, and under applicable Lahontan regulations. All regulatory agencies, through their respective rules, designate the type of review necessary, issue mandatory permits if needed and require mitigation measures to address specific potential environmental impacts. The level of review and approval required depends on the proposed nature and scale of forest treatment.

b. Wetlands/SEZs

The California Forest Practice Rules under the California Board of Forestry and California Department of Forestry and Fire Protection (CalFire) require establishment of a WLPZ and both Tahoe Regional Planning Agency (TRPA) and Lahontan Regional Water Quality Control Board (Lahontan) regulations govern the range of permitted activities and methods (e.g., equipment restrictions) within an SEZ. These rules and regulations assure that sensitive resources are not adversely affected.

c. *Water Quality*

Best Management Practices (BMPs), as well as other erosion control measures, are necessary to minimize and/or eliminate the potential for dirt and suspended particles from entering streams and Lake Tahoe. The California Forest Practice Rules, along with TRPA and Lahontan regulations, stipulate which BMPs are minimally required based upon the scope of the project. An example of a typical BMP involves the establishment of erosion control structures, such as waterbars prior to the completion of mechanically established or utilized road and trail networks.

8. Community Involvement/Public Participation

The Conservancy encourages all interested members of the community to participate in and comment on proposed forestry projects. Prior to implementation of forestry projects greater than three acres in size, the Conservancy notifies adjacent property owners by mail. The notification describes the proposed project area, summarizes the type of treatment (e.g., mechanical, hand, pile/burn, etc.), and provides the opportunity for input on the proposed project. Staff responds to all public inquiries and meets onsite to discuss the proposed project in greater detail if requested. Depending upon the volume and the nature of the comments, staff may schedule a public meeting in the neighborhood to encourage communication with a wide audience at one time. In addition, informational materials are available for the public to advise them of prescribed burning and smoke impacts.

a. *For All Projects*

- A. Encourage all interested members of the community to participate in and comment on proposed forestry projects.
- B. Respond to all public inquiries; if requested, potentially meet onsite to discuss the proposed project in greater detail.
- C. Depending upon the volume and the nature of the comments, schedule one or more public meetings in the neighborhood to encourage communication with a wide audience.
- D. Provide notice to Lake Tahoe media sources in advance of prescribed burning activities.
- E. Distribute informational material related to prescribed burning and smoke exposure to the public upon request.

b. *For Projects on Parcels Greater than Three Acres*

Notify adjacent property owners by mail prior to project implementation. The notification will include: the proposed project area, description of treatment (e.g., mechanical, hand, pile/burn, etc.), and instructions for providing comment.